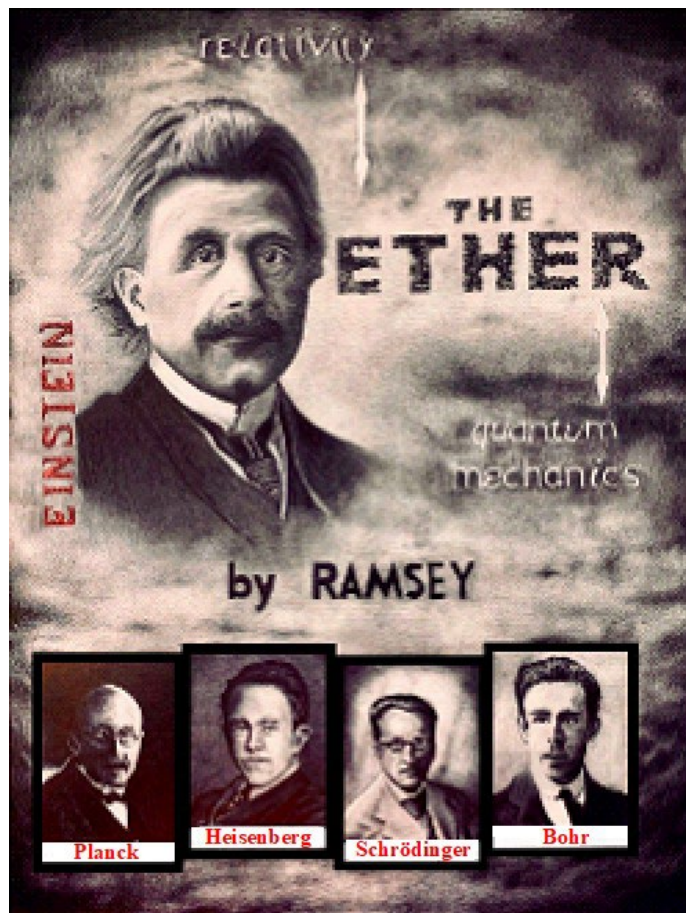

THE ETHER

Ramsey

John Chappell Natural Philosophy Society



 **John Chappell**
Natural Philosophy Society

JOHN CHAPPELL NATURAL PHILOSOPHY SOCIETY PUBLICATION

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DEDICATION

Dedicated to the Creator

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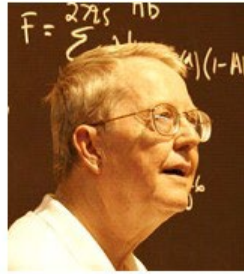
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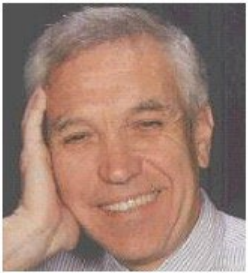
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R. R. R.

ABSTRACT

The intent of this publication is to revise the assumptions associated with Einstein's relativity theories, thereby postulating an alternate theory, somewhat analogous to Einstein's concepts, however, now compatible with the existence of the ether. Therefore, as will be revealed, relativity and quantum mechanics, rather than being disconnected, are then a part of one overall unified theory.

PROLOGUE

For those individuals who read this book, it will be readily obvious that the author is not a physicist nor an engineer, since this publication uses only minimal math. In addition, the vocabulary differs from accepted scientific terminology, and its organization deviates from conventional scientific standards. Consequently, most scientists and physicists will not even consider evaluating this dissertation.

Nevertheless, the author's guess is that the only reason you are reading it, is this: The concepts presented in Chapter 3 demonstrate that the Michelson–Morley experiment (MMX), as classically performed/interpreted, as well as other experiments, which are used as proof of the ether's absence, are instead shown to be silent as to whether or not the ether exists.

So, presuming this postulate is accepted, furthermore, given the other observations presented in Chapter 3, which virtually prove the ether's existence, a new theory of relativity needs to be formulated, moreover, based on the ether. Hopefully, because of the credibility of Chapter 3, even though the author is not a physicist, the scientific community will then be motivated to read and evaluate this entire treatise. However, please keep in mind that it is not in the classical sense a scientific publication. Pay attention to its substance and ideas, rather than its superficial form.

Notice to the reader.

There are numerous references to websites in each chapter of this book. However, for a variety of reasons, over time URLs become unavailable. Nevertheless, they still can be accessed at the website: Wayback Machine, an internet archive [<https://archive.org/>]. Please refer to that site if necessary.

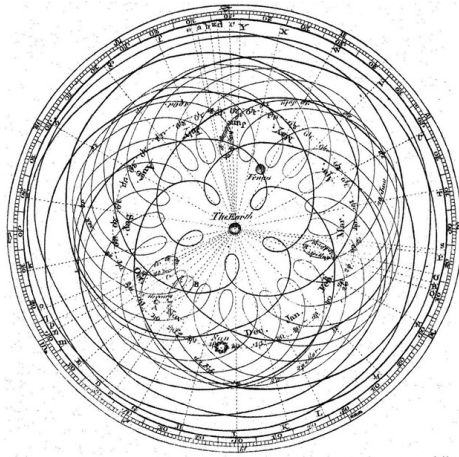
PREFACE

Einstein's relativity theories (SRT, GRT), as well as quantum mechanics (QM) are extremely difficult to fully grasp without the use of intricate mathematics. For instance, four-dimensional space-time is not easily visualized. In addition, quantum mechanics utilizes mathematical relationships that correctly predict outcomes, even though the theory makes no visual common sense. As a result, it is very difficult for the average person to appreciate them, let alone understand them. Here is a statement by the famous quantum physicist Richard Feynman, a Nobel Laureate, supporting this belief, "If you think you understand QM, then you don't understand QM."

In contrast, this publication uses three-dimensional space, logic, and a few equations to postulate a new alternative theory that encompasses, moreover, interconnects SRT, GRT, and QM. It is the author's conviction that modern-day physics (regarding relativity and QM) has lost sight of reality by using complex mathematical equations to produce correct outcomes. Nevertheless, the math employed does not characterize the actual and true universe. This paradox is apparent with present-day high school/college physics courses, whereby students often manipulate equations with no basic understanding as to how the math actually represents reality.

For instance, to clarify this divergence of mathematics versus reality, follow this logic. There are several methods by which math (and geometry) can portray the physics of the solar system, such as the Ptolemaic versus Copernican theories, as pictured in figures 0.1 and 0.2. With the use of mathematics, both theories accurately predict the orbital mechanics of the solar system, but one represents reality while the other does not.

It is generally accepted that the best theory is the simplest (Copernican and Kepler), or in other words, Occam's razor, the theory that is closest to what makes common sense (Copernican and Kepler). In essence, determining the best theory should be pursued first, then followed by the mathematics. The point being, the focus should be on the theory representing reality rather than just mathematics.



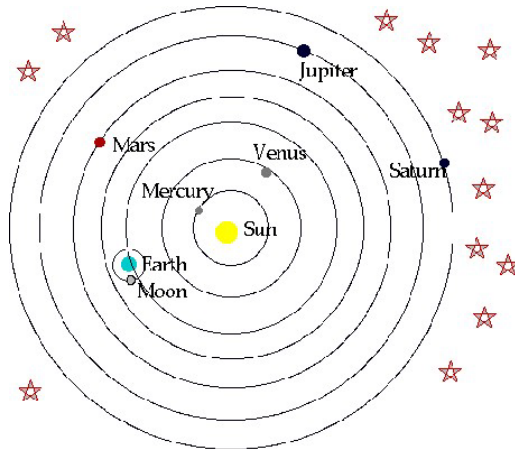
Wikimedia Commons



Ptolemy

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Figure 0.1 Ptolemaic Model of the Solar System [Fair Use]



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Copernicus

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Figure 0.2 Copernican Model of Solar System [Fair Use]

Having stated all this, math is absolutely crucial for a rigorous proof of any given reality theory. So one should not demean math, only place it in its proper perspective. For this reason, one primary goal of this book is this: The average nonscientific individual should be able to read, moreover, easily comprehend, this dissertation and its concepts, without the use of math.

The Michelson–Morley experiment (MMX) is the main foundational block used as a validation for Einstein’s relativity theories. Its null outcome (as classically performed/interpreted)

implies there is no ether. Consequently, another basic goal of this publication is to demonstrate that the "null result" is, in fact, also compatible with the ether existence, rather than only a proof of its absence.

Essentially, this new pictorial theory, defined in Chapter 1 of this book as the Preferred Frame Special Relativity Theory (PFSRT), combines Galilean transformation theory and Newton's theories (three-dimensional space) with Maxwell's EM theory (velocity of light (c) relative to the observer) to propose a new relativity theory somewhat equivalent to SRT, but now, in this case, the speed of light (c) is a function of an ether (PFSRT) not a constant (c) in empty space ($=c$ relative to the observer of SRT irrespective of the observer's velocity).

In order to accomplish this objective, one needs to read, grasp, and accept the theories and assumptions presented in this work. They are extremely logical. As a result, it will eventually become crystal clear why the MMX always demonstrates isotropy, as classically portrayed/interpreted, specifically when performed on the rotating surface of the Earth, even in the presence of the ether wind. If correct, Einstein's SRT main foundation block validating the MMX is eliminated, and his relativity theories then collapse. As a result, a new groundwork of physics is required: **The Ether**.

CHAPTER 1

SRT/PFSRT

1.1 Introduction

For an overall review of Einstein's relativity theories with respect for the neophyte, the book *Relativity For The Layman, a Simplified Account of History, Theory and Proofs of Relativity* by James Coleman, The New American Library of World Literature Inc., is recommended, since in order to comprehend this book, one must have at least some rudimentary knowledge of both Einstein's Special Relativity Theory (SRT) and General Relativity Theory (GRT).

In addition, before evaluating Chapter 1, for those individuals who have little experience with SRT, it would be beneficial to peruse Appendix A of this publication, which explains the reasoning behind Einstein's SRT. Furthermore, the websites listed below would also be highly helpful.

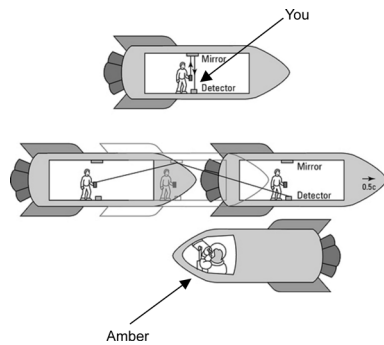
"Understanding Einstein's Special Theory of Relativity"

"Special Relativity Explained In Under Three Minutes"

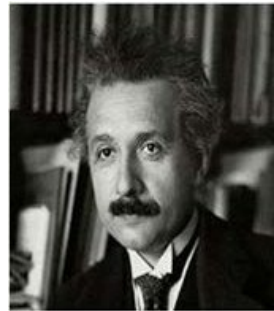
"Theory Of Relativity Explained In Seven Minutes"

A brief section of Appendix A is now presented below (from Andrew Zimmerman Jones and Daniel Robbins authors of *String Theory for Dummies*):

- *Einstein's theory of special relativity created a fundamental link between space and time. The universe can be viewed as having three space dimensions up/down, left/right, forward/backward, and one-time dimension. This four-dimensional space is referred to as the space-time continuum.*



Credit: Daniel Robbins



Albert Einstein

Figure 1.1 Spaceship Model for SRT [Fair Use]

- If you move fast enough through space, the observations that you make about space and time differ somewhat from the observations of other people who are moving at different speeds.
- You can picture this for yourself by understanding the thought experiment depicted in Figure 1.1. Imagine that you're on a spaceship and holding a laser so that it shoots a beam of light directly up, striking a mirror you've placed on the ceiling. The light beam then comes back down and strikes a detector.
 - (Top) You see a beam of light go up, bounce off the mirror, and come straight down. (Bottom) Astronaut Amber sees the beam travel along a diagonal path.
 - However, the spaceship is traveling at a constant speed of half the speed of light ($0.5c$, as physicists would write it). According to Einstein, this makes no difference to you; you can't even tell that you're moving. However, if astronaut Amber were spying on you, as in the bottom of the figure, it would be a different story.
 - Amber would see your beam of light travel upward along a diagonal path, strike the mirror, and then travel downward along a diagonal path before striking the detector. In other words, you and Amber would see different paths for the light and, more importantly, those paths aren't even the same length. This means that the time the beam takes to go from the laser to the mirror to the detector must also be different for you and Amber, so that you both agree on the speed of light.

With reference to the above excerpt, if the speed of light is (c) for both observers, then time and distance must differ with respect to you and Amber in order to maintain the speed of light at (c) ; $(c) = \text{distance}/\text{time}$. So if (c) remains constant, then distance/time must change proportionally. Referring to this example, the definition of (c) , as well as the concept of distance, are both a function of "time." And other than a mathematical equation, no rational reason or physical process is given as for why, relative to the observer, both distance and time change as a function of a constant (c) , essentially, no underlying cause and effect is presented. Please commit this example to memory, for it will be referred to at the end of this chapter from a different perspective.

There are two postulates of Einstein's SRT. The first, with respect to inertial motion, is that all is relative; therefore, the laws of physics are the same in all inertial reference frames. And second, the velocity of light is always (c) in empty space ($= (c)$ relative to the observer of SRT = regardless of the observer's inertial velocity).

From these postulates, Einstein then deduced that with respect to the observer, as an object increases its velocity, its inertial mass increases, its "rate of time" slows down, and distance in the direction of motion decreases (including the physical length of the object in the direction of motion). In addition, Einstein assumed the ether as nonexistent.

In contrast, this alternative SRT, now defined as the **Preferred Frame Special Relativity Theory (PFSRT)**, posits the presumption of the ether, the preferred frame for the speed of light of (c), with very similar, although not identical, outcomes. Listed below are the four basic assumptions of PFSRT.

1.2 Assumption of the Structure of the Universe

Please refer to Figure 1.2 below and the following discussion. Figure 1.2 depicts the expansion of the universe over time. This is a 2D representation of a 3D universe.

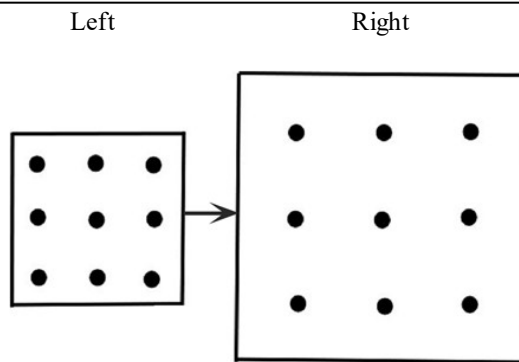


Figure 1.2 Expansion of the Universe

- *The ether (box) of the universe expands from left to the right. As a result, the galaxies (black dots) located within the box then separate from one another. However, the galaxies still remain at rest with the ether. Take note with reference to Figure 1.2 that the gravitational fields of the galaxies are ignored. This will be dealt with later on in Chapter 2 (GRT).*

The box on the left is smaller compared to the box on the right. The boxes represent the space (ether) of the universe. As shown above, the change in size from left to right represents the expansion of the universe over time. The black dots located within the box portray individual galaxies. They are all at rest with space, or by the terminology used in this book, the ether. For now, assume the galaxies are not associated with their own gravitational fields. This will be discussed later on in this publication in Chapter 2.

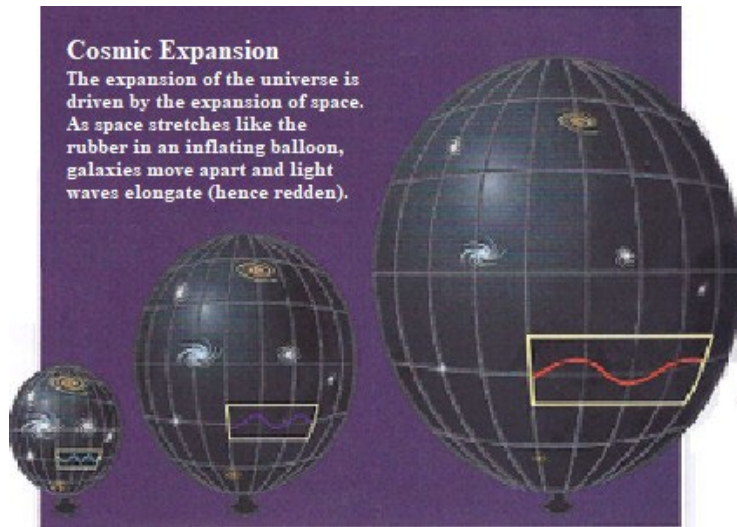
Notice, regarding Figure 1.2, as the ether or space expands in the areas between the galaxies (dots), the universe also expands. Nevertheless, the galaxies still remain at rest with the ether. With reference to this expanding ether frame, the velocity of light is fixed at (c). This basic model is the preferred frame of the universe, again for future reference, defined as the **Preferred Frame Special Relativity Theory (PFSRT)**.

Observe also, as the universe expands, from the perspective of an observer located within each galaxy at rest with the ether, the further a galaxy is initially from the observer, the faster is its movement from that observer. This applies to any observer associated with any galaxy; so each observer perceives the same effect. In addition, as the ether expands (space of universe expands), it then stretches the wavelength of the light traveling within it at (c).

Consequently, the further a galaxy is from an observer, then for that observer, the greater the redshift of light from that galaxy. This matches the redshift of galaxies observed by astronomers; the greater the redshift, the greater its distance with respect to the observer on Earth.

For further clarification, here is another analogy. See Figure 1.3.

The expansionary principle is illustrated below:



Michael S. Turner, "Origin of the Universe," *Scientific American Special Collector's Edition: Extreme Physics, Probing the Mysteries of the Cosmos*, August 2013, 39

Figure 1.3 Balloon Expansion [Fair Use]

This is analogous to Figure 1.2 but now with reference to the surface of a balloon.

This example is the classic illustration, whereby the universe is depicted as limited to the surface of a balloon, with the galaxies painted on its surface (2D illustration representing a 3D universe).

As the balloon is blown up, it expands; the galaxies spread further and further apart from one another. Nevertheless, the galaxies still remain at rest with the balloon's surface. In other words, as space or the ether expands (the surface of the balloon), the universe also expands, but the galaxies remain at rest with space/ether (surface of the balloon).

The fundamental distinction between PFSRT versus SRT is that this new theory posits that space is the ether, **the medium where light travels within it at a constant (c)**. In contrast, SRT denies it exists; moreover, (c) is constant in empty space (c relative to the observer).

1.3 Assumption of Inertial Mass

From The Physics Classroom online comes this classical definition of inertia: *The resistance an object has to a change in its state of motion. In other words, it is the tendency of objects to keep moving in a straight line at constant linear velocity.*

Newton's first law of motion states: *An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force. Objects tend to "keep on doing what they're doing." In fact, it is the natural tendency of objects to resist changes in their state of motion. This tendency to resist changes in their state of motion is described as inertia.*

So, the inertial mass of an object is defined as its resistance to acceleration by an applied force.

Einstein's SRT presumes that the inertial mass of an object, which is a group of associated atoms, is the intrinsic property of the object. What is more, no other factor is involved.

Alternatively, PFSRT differs considerably. It postulates that the ether is the entity, which resists an object's acceleration, although not its velocity. In addition, each of the elements elicits a different degree of resistance (the more the atomic weight the more the resistance). In other words, an object's degree of resistance to its acceleration by force from the ether is defined as its inertial mass.

This new theory →also← posits: The greater an object's velocity with respect to the ether of PFSRT, the greater then is the resistance to its further acceleration derived from that ether (Lorentz transformation equation). This is to some extent, at least superficially, analogous to an exponential function. However, one important different aspect to acknowledge is that the velocity of the object cannot exceed the speed of light.

The mathematical equation that expresses this concept is called the Lorentz transformation, which is depicted below followed by a graph of that equation.

Lorentz Transformations

See Lorentz equations below and the following discussion.

$$B(\mathbf{v}) = \begin{bmatrix} \gamma & -\gamma v_x/c & -\gamma v_y/c & -\gamma v_z/c \\ -\gamma v_x/c & 1 + (\gamma - 1) \frac{v_x^2}{v^2} & (\gamma - 1) \frac{v_x v_y}{v^2} & (\gamma - 1) \frac{v_x v_z}{v^2} \\ -\gamma v_y/c & (\gamma - 1) \frac{v_y v_x}{v^2} & 1 + (\gamma - 1) \frac{v_y^2}{v^2} & (\gamma - 1) \frac{v_y v_z}{v^2} \\ -\gamma v_z/c & (\gamma - 1) \frac{v_z v_x}{v^2} & (\gamma - 1) \frac{v_z v_y}{v^2} & 1 + (\gamma - 1) \frac{v_z^2}{v^2} \end{bmatrix},$$

It is not necessary for the novice to understand the actual equation, but it is essential to comprehend the graph of the equation as shown below.

A graph of the Lorentz transformation equation for mass vs. velocity is shown in Figure 1.4 below. The inertial mass is represented by vertical axis and the velocity, from left to right, up to the speed of light is depicted by the horizontal axis. The increased relativistic mass as a function of velocity is much more pronounced as the object approaches the speed of light (graph is skewed to the right). Furthermore, the object's velocity cannot exceed the speed of light because of infinite relativistic mass.

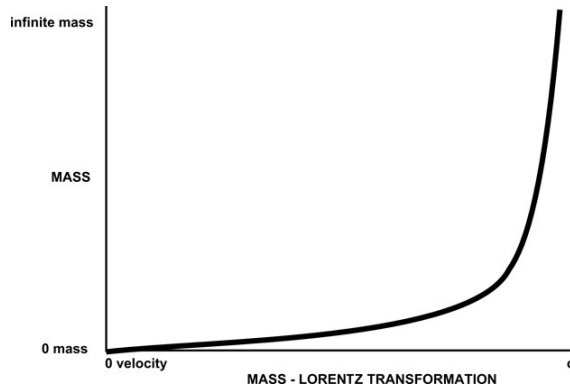


Figure 1.4 Mass vs. Velocity

In his specific case, the author's use of the Lorentz transformation function (LTF) only refers to how inertial mass increases as the object's linear velocity increases relative to ether. SRT's LTF equations cannot describe this new theory. Actually, the graph alone best depicts this new concept, however, not the above LTF equation which is specific to only SRT. For future reference, the concept depicted by this graph will be defined as the **Lorentz transformation function (LTF)**. Again, the graph is skewed and only superficially similar to an exponential function, but is not, in fact, the latter of which doubles at a set constant rate.

Nevertheless, for the benefit of the novice and for simplicity of visualization, the author has decided to define/picture it this way. Because, in the author's opinion, the novice will understand exponential function better than Lorentz transformation function, even though exponential function is technically not correct. So for future reference, the letters **LTF** refers to the Lorentz transformation function concept, specifically the LT curve as depicted in Figure 1.4.

For example, compared to an observer at rest with the PFSRT, an object at a high velocity relative to the PFSRT, exhibits increased inertial mass. In addition, as illustrated in the above graph, when the object's velocity increases linearly, again relative to the PFSRT, its inertial mass increases by an LTF. Again, the velocity of the object cannot exceed the speed of light as a consequence of infinite relativistic inertial mass. **Regarding the new PFSRT, all is not from the observer's reference frame (SRT), rather from the frame of the ether at rest (PFSRT).**

This is somewhat, and the author emphasizes somewhat, analogous to a boat being propelled in water: the greater the velocity of the boat in the water, the more force needed to further increase its velocity (acceleration), in this case, as an exponential function. Yet, there is a difference: water resists both the velocity and acceleration of the boat, whereas the ether only resists the acceleration of the object but not its velocity.

For review, see Figure 1.5 below and the following caption. →Take note when reviewing this figure that an observer is also an object←. This connection will be applied/relevant later on in this chapter.

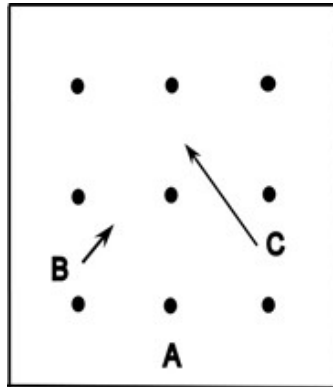


Figure 1.5 Rest Mass, Inertial Mass, and Relativistic Inertial Mass

- Assume A, B, and C are identical objects (observers). The box represents the ether of the universe (PFSRT). The dots portray individual galaxies.

The lengths of the arrows depict the relative velocities of objects (observers) B and C, (the longer the arrow the greater the velocity), whereas object/observer A is at rest, all relative to the PFSRT. An object/observer at rest with the PFSRT (A) resists acceleration derived from the ether. This is defined as the object's rest inertial mass.

- Alternatively, if an object/observer (B or C) possesses a velocity (arrows) relative to the PFSRT ($B < C$), then, as the velocity increases linearly ($C > B$), the resistance to its acceleration, again as a function of the ether, increases by an LT function. This is defined as the object's relativistic inertial mass (B or C).
- Once more the velocity of the object/observer is limited by the speed of light.

1.4 Assumption of the "Rate of Time"

The great Aristotle thought time is fundamentally linked to change and movement. "Where there is alteration or movement, there is time, for everything that comes to be and ceases to be are in time."

In essence, time is the motion of matter through space; the latter word defined within this publication as the ether. You cannot describe time without motion, whether a clock, a pendulum, or an atomic clock (vibrations). In fact, all descriptions of time portray motion of matter through space, whether inertial or accelerated.

Therefore, if the ether slows the acceleration of matter, then it also slows the ensuing velocities derived from those accelerations. Thus, it determines the overall rate of motion, within a given inertial reference frame, or in other words, the "rate of time." Fundamentally, "time is just our counting of motion by comparing all motion to some repetitive motion, like the vibrating atoms of an atomic clock." (Lindner) So without motion, there is no time.

Accordingly, an atomic clock placed with B or C will have a slowing in the rate of its vibrating (acceleration) atoms compared to one positioned with A. This is because with respect to B and C, there is more resistance from the ether ($C > B$). In other words, from the perspective of A, the preferred frame, the atomic clocks placed with B or C, then will "tic" slower (C slower than B). This example illustrates the slowing in the rate of time from the frame of PFSRT.

As another example, assume you are absolutely alone in empty space (ether) where nothing else exists. One would assume that you would have the "notion of time" just by thinking. But if

all the chemical reactions (accelerations), as well as the vibrations (accelerations) of the atoms and molecules in your body slowed, including your brain molecules and chemical reactions, then all movement in your frame slows down, including your "rate of thinking." You would not perceive this effect, as you exist within this slowing frame.

In contrast, someone else in a nonslowing frame, observing you, would notice it. In addition, if all motion in your inertial frame suddenly ceased, then for you, time stops. No motion. No time. For instance, in Hollywood science fiction movies, when time stops, all motion stops.

Now, given all of the above, as shown in Figure 1.5, when observer B or C (object) travels at a high velocity relative to the PFSRT, his/her relativistic mass increases, and his/her rate of time decreases. Additionally, as the object's (observer's) velocity increases linearly, the inertial mass increases by an LTF. And as the inverse, as the velocity increases linearly, because accelerations slow, the rate of time decreases (time dilation) by an LTF.

This last conception is shown and described below in Figure 1.6.

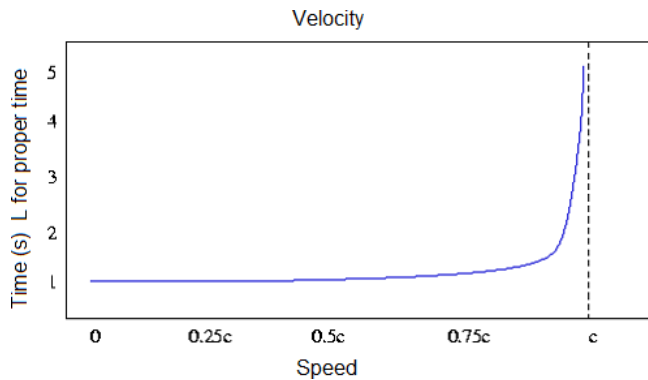


Figure 1.6 Velocity vs. Rate of Time

- The horizontal axis represents the velocity of the object as a percentage of speed of light relative to the PFSRT.
- The vertical axis depicts "time dilation" or the slowing in the "rate of time" as a function of velocity.
- This is a Lorentz transformation curve, defined in this chapter as an LT function. However, in this instance, rather than relativistic inertial mass as just described, it is relevant to "time dilation" or rate of time.
- Notice, the graph shown above is not really an exponential curve, which doubles at a constant set rate. However, it is presented by the author in this way so that the average individual can easily visualize and understand the basic idea.
- It is not necessary for the novice to understand the Lorentz transformation equation, but it is necessary for him/her to know the meaning of the graph.

In his specific case, the author's use of the LTF only refers to how rate of time decreases as the object's (observer's) linear velocity increases relative to ether. SRT's LTF equations cannot describe this new theory. Actually, the graph alone best depicts this new concept, however, not the above LTF equation which is specific to only SRT.

As just described, this inverse mathematical relationship (inertial mass/rate of time) occurs because both are functions of the increased resistance to matter's acceleration derived from the

ether. Obviously then, they are intertwined by that ether. This is the visual reason that shows why inertial mass and rate of time are always inversely proportional to one another.

Return again to the figure below.

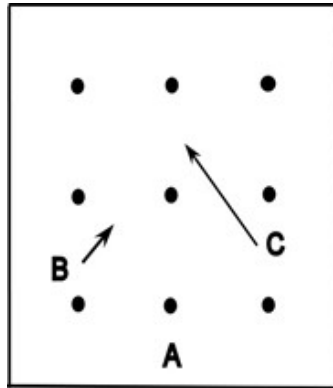


Figure 1.7 Repeat of Figure 1.5

Rest Mass, Inertial Mass, and Relativistic Inertial Mass

For reinforcement, compared to observer A located at rest with the PFSRT, both observers B and C possess increased relativistic inertial mass, (as a function of their velocity relative to the ether of PFSRT) moreover $C > B$ (C velocity $>$ B).

Furthermore, our measuring sticks for evaluating time all involve repetitive motions, such as an atomic clock, and those repetitive motions are accelerations. Therefore, again, as a function of the ether, an atomic clock placed with B/C will have increased resistance to the acceleration of its vibrating atoms, and it slows down. For that same reason, an observer located at B/C will experience a slowing of all of his/her bodily chemical reactions, including thinking (time dilation).

→So compared to the frame of A (PFSRT), B and C possess not only increased relativistic inertial masses but also a slowing of their "rates of time" in the mathematical LTF as just presented←.

1.5 Distance, Velocity, and the Laws of Physics Versus Time

In order to understand this fourth assumption, acceptance of the extremely abstract following concept is paramount.

1. The concept of distance as determined by a physical measurement (e.g., ruler), now defined as the **measuring stick distance**, is a distinct idea from the **motion of distance** as a function of time ($d = r \times t$); it is defined as the motion distance. Each is totally independent of the other; they are not the same thing. Essentially, the measuring stick distance is a universal constant with no time element (length of matter). But the motion distance is a direct function of the observer's rate of time ($d = r \times t$) which, again, is an effect of motion. See Section 1.4 of this chapter.

2. By using **only** the motion distance and →not the measuring stick distance←, if the observer's rate of time changes, then his/her *perception* of distance also changes ($d = r \times t$).

3. By using **only** the motion distance and \rightarrow not the measuring stick distance \leftarrow , if the observer's rate of time equally changes as in 2 above, then his/her *perception* of velocity also changes ($v = d/t$).

4. As a result, considering both of the above, by using **only** the motion distance and \rightarrow not the measuring stick distance \leftarrow , then the observer's new *perception* of velocity of light and his/her new *perception* of the motion counteract each other ($d = r \times t$) ($v = d/t$) in such a way that the observer's *perception* of the velocity of light remains a constant (c) regardless of his/her time rate—this is purely a mathematical function without the use of measuring stick distance.

5. \rightarrow The measuring stick distance is a constant, whereas the motion distance varies as a function of the observer's rate of time \leftarrow . So $\text{vis-}\hat{a}\text{-vis}$ explicitly, our local time frame on Earth, we define/observe the two different concepts as equivalent to one another. Because, in order to define motion distance, one must incorporate the measuring stick distance ($d = r \times t$), specifically from our own frame of time. Essentially, for us, this is our only possible frame of reference for time.

6. We at present have no ability to change our local Earth frame of time and then define/observe the velocity of light and distance from that other frame. However, if we could, in fact, change our time frame, the amalgamation of motion distance and the measuring stick would then be observed/defined as equal from the perspective of that other frame. Therefore, it would differ compared to our local frame on Earth, even though the equations remain the same.

7. For that reason, when comparing divergent observer time frames, the equations $d = r \times t$ and $v(c) = d/t$ (also utilizing the measuring stick distance), it makes no sense; it is incomprehensible.

8. The laws of physics such as ($\text{force} = ma$) and ($\text{momentum} = m \times v$) also involve time and distance; accordingly, the same principles hold true.

9. In conclusion, here is a recap; please review.

- By using **only**, and the author emphasizes **only**, the observer's perception of motion distance and his/her perception of velocity, (specifically **only** the equations of $v = d/t$ and $d = r \times t$), then for that observer, the velocity of light and the laws of physics remain constant regardless of his/her time frame.

- In addition, as discussed above, one cannot compare different observer frames of time by using the classic equations of ($v(c) = d/t$), ($d = r \times t$) while also employing the measuring stick distance.

- What is more, given the fact that motion distance (variable) and measuring stick distance (constant) are defined/amalgamated/observed only with respect to a given/specific observer's time frame, then his/her perceived laws of physics and the perceived velocity of light will diverge when equating diverse frames of time, once again not comparable by using the equations ($v(c) = d/t$), ($d = r \times t$) and also with the use of the measuring stick distance. In essence, an entirely new mathematics would be required.

At this time, the concepts described above will be employed to describe how the perception of distance, the perception of the velocity of light, and the perception of the laws of physics are a function of the observer's "rate of time." Now please apply the above concepts to the descriptions/mental imagery as depicted below, especially the distinction between the motion distance and the measuring stick distance.

The following descriptions are extremely abstract/confusing, so for the benefit of novice, explained from multiple different perspectives; for that reason, there is considerable redundancy. Hopefully, the many different viewpoints pictured below will help the reader to conceptualize this novel theory (PFSRT). The outline is as follows:

- A. The Perception of Distance as a Function of the Observer’s Rate of Time
- B. The Perception of Distance and the Perception of the Velocity of Light as a Function of the Observer’s Rate of Time
- C. The Perception of Distance, the Perception of the Velocity of Light, and The Perception of the Laws of Physics as a Function of the Observer’s Rate of Time
- D. Further clarifications including how the above concepts relate to SRT and PSRT

A. The Perception of Distance as a Function of the Observer’s Rate of Time

Distance = rate x time. Essentially, distance is a direct function of time. Likewise, with reference to PFSRT, the rate of time is also assumed to be directly proportional to distance.

Now, refer to Figure 1.8 below and the following discussion.

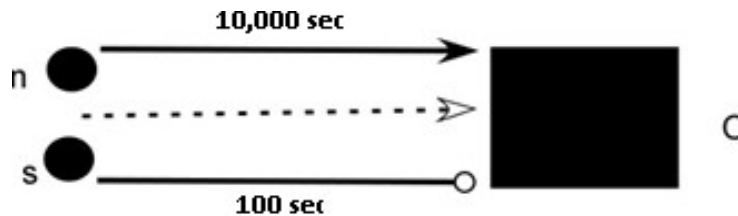


Figure 1.8 Two astronauts, different rates of time but with the same motion.

- (Black box O) = object.
- (Upper black circle) = astronaut (n), our local time frame.
- (Lower black circle) = astronaut (s) slow time frame compared to n.
- Time = solid lines labeled in seconds.
- Dotted line represents equal velocity of (n) and (s) towards O. Dotted line actually represents equal motion, since the concept of velocity has a component of time and (n) and (s) have different "rates of time." **Essentially, the term motion has no time element.**
- One way of perceiving this concept of equal motion is this: n and s have the same velocity but (s) exists in a slower time frame. Therefore, $d = r \times t$ or the idea of velocity ($v = d/t$) does not adequately define this example.

In order to give explanation to this concept, imagine two astronauts, one named (n) and the other (s), located side by side and at rest within the assumed ether of the universe (PFSRT). In addition, envision an object (O) positioned at a given interval of the ether from (n) and (s), moreover, also at rest with the PFSRT. Furthermore, visualize there are no other objects in this hypothetical universe.

Assume astronaut (n) exists in our local time frame. In contrast, compared to ours, the time frame of (s) is extremely slow. Subsequently, presume they both move towards object O (black square = O) at precisely the same velocity, →actually motion← (single dotted line = motion with no time element). Both astronauts count seconds. Now, (n) counts 10,000 seconds before he/she arrives at (O).

Alternatively, (s) counts only 100 seconds before arrival, since he/she exists in a slower time frame compared to (n).

So, from the perspective of (n), he/she assumes a long distance to the object, because it took a considerable length of time to get there—10,000 seconds. In contrast, (s) presumes a short distance to the object, since he/she got there right a way—100 seconds. In other words, the defi-

nition of distance, in this instance, is the time interval between two events or the \rightarrow perception \leftarrow of the amount of space between two objects (in this case, the starting point and object O).

Discern again, motion distance and measuring stick distance are two separate concepts/things. Therefore, regarding the following discussions, please pay close attention to when both the observer's perception of motion distance ($d = r \times t$) and that observer's perception of velocity ($v(c) = d/t$) are used together, alone, compared to whenever the measuring stick distance is also incorporated.

For further clarification as to how the observer's reference frame of time relates to his/her *perception* of motion distance, assume there is a preferred frame (PFSRT, ether at rest, universe). If it takes me, with respect to my time frame, six billion years to travel through space (ether) at a \rightarrow given motion \leftarrow , $1/100$ across the visible universe, it is a long distance.

But relative to your slower time frame, if it takes you only one second, moreover, at the \rightarrow same motion \leftarrow , it's a short distance. So this concept of motion distance is a function of the rate of time. It is not related to physical measurement of matter (measuring stick distance), but rather the observer's perceived distance through space (motion distance). Recall that our notions of distance and velocity involve time ($d = r \times t$ and $v = d/t$). Again, this distance definition is not a function of the physical measured length of ether traveled through, nor the physical length of our bodies (measuring stick distances). Rather, it is the observer's perception of distance through space/ether in the direction of motion as a function of that observer's time frame (motion distance).

Question: If as given above, your time frame slows down vis-à-vis mine, then compared to my perception, do both the universe (space/ether) and you physically contract (length) in the direction of motion? Or does the universe, as well as you, remain unaffected, moreover, only your perception of distance through space decreases (relative to me) as a function of your slower frame of time (motion distance)? For the latter, you would see objects of the universe pass you by faster than for me (measuring stick distance), but your perception of distance would still be based on how long it took to get there = one second (motion distance).

B. The Perception of Distance and the Perception of the Velocity of Light as a Function of the Observer's Rate of Time

Observe once again, motion distance and measuring stick distance are two separate concepts/things. In addition, recollect the amalgamation/unification of the measuring stick distance with the motion distance changes from the perspective of the observer when/if that observer's "rate of time" changes. Once more, please pay close consideration as to when the observer's perception of motion distance ($d = r \times t$) and that observer's perception of velocity ($v(c) = d/t$) are used together, alone, versus when the measuring stick distance is included.

This distance concept is exceedingly abstract, therefore, confusing. In addition, in the author's opinion, the classic equation of ($d = r \times t$) and the idea of velocity ($v = \text{distance}/\text{time}$) cannot adequately define or describe this concept.

For instance, relevant to our own local rate of time reference frame, everything is logical, moreover, makes common sense ($d = r \times t$) ($v = d/t$). Alternatively, for an observer existing within a reference frame of a different rate of time, when comparing the two different frames, it becomes confusing since both scenarios (the two equations listed above) involve the mathematical symbol t (time). Essentially, if an observer's "time frame" changes, then between those two frames, perception of d and v also changes. For this reason, relative to the observer, when equating different frames of time, by using only ($d = r \times t$) ($v = d/t$), the explanations are not only very difficult to describe but perplexing. The author finds it very challenging to define this complex and abstract topic.

Therefore, this velocity/distance concept will now be re-explained from multiple different perspectives or reference frames, mainly involving mental imagery as given below. However, before proceeding, take note that the velocity of light (c) is a function of distance and time ($c = d/\text{time}$). So an apples-to-apples comparison for the definition of distance should also be a function of motion through space/ether, again, a function of time ($d = r \times \text{time}$). Note this assumption does not involve the measuring stick distance.

1. Regarding astronomy, recall that the distance to the stars is measured in light years. Distance = (c) (speed of light) \times t (light years, which is a function time). And velocity (c) = distance/time. So, if the observer's "rate of time" affects the perceived distance to a star through space/ether in the direction of motion (object in Figure 1.8). And, more importantly, if they are directly proportional to one another (t/d), moreover, using **only** the concepts/equations of $v(c) = d/t$ and $d = r \times t$, then the speed (velocity) of light remains at a constant (c) for all inertial observers. This concept is abstract but will be clarified in the following passages. Again, this assumption does not involve the measuring stick distance.

2. Take note, the above concept depends upon the definition of rate of time as just elucidated (Section 1.4) and how that time frame relates to an observer's perceived distance through space in the direction of motion (Section 1.5) vis-à-vis specifically the speed/velocity of light. So, as a consequence, inertial motion produces a constant value of (c) for all observers, irrespective of their different time frames, which is one of the two basic assumptions of Einstein's SRT but now a function of the ether not the observer (see examples below). Once again, this assumption does not incorporate the measuring stick distance.

3. For instance, assume an individual on Earth is observing reflected sunlight from Jupiter. That light is traveling towards that person at a velocity of 186,000 mps, through a given measuring stick distance x . Now, if the observer's rate of time slows down by one-half and if nothing else changes, including the \rightarrow fixed movement of light through the ether/space \leftarrow , the light is then traveling towards that observer at $(186,000 \times 2)$ mps. (Recall, the movement of light is a universal constant with no time element.)

But that observer's perception of the traveling distance to Jupiter is cut by one-half as well, since at the same \rightarrow slower time frame \leftarrow , it only takes one-half the time to get there from Earth ($d = r \times t$) = \rightarrow motion distance \leftarrow (not the measuring stick distance which is another universal constant). Taking into account both of these factors, then no matter what the observer's rate of time, the perceived velocity of light through space/ether, specifically in the direction of motion, remains at (c), or relative to the latter example $(186,000 \times 2)$ mps \times (one-half the distance) = 186,000 mps. Yet again, this assumption does not involve the measuring stick distance. Notice, regarding this example, it is fairly easy to envision from the observer's reference frame, the first part, how that observer's "time rate" relates to his/her perception of the velocity of light through space/ether as just described.

- $V = d/t$ (rate of time). So if the time frame of the observer slows, then for that observer the velocity of light increases. This conception is an inverse proportional function. \rightarrow This assumption does not involve the measuring stick distance \leftarrow .

However, it is more difficult to imagine the second part, as to how the observer's time rate affects perception of distance through space in the direction of motion. Nevertheless, both are a function of the observer's rate of time.

- $D = r \times t$ (rate of time). So, if the time frame of the observer correspondingly slows, then for that observer distance decreases (motion distance). This is a direct proportional function. \rightarrow This assumption does not involve the measuring stick distance \leftarrow .

Observe that the two *perceptions* depicted above (direct/inverse) counteract one another. So, for the observer, the speed of light remains constant at (c) . →This assumption does not involve the measuring stick distance←.

Again, with respect to this theory, distance as measured by a physical ruler, defined as a measuring stick distance, is a different concept compared to distance as a perception of movement through space (ether), which involves the rate of time ($d = r \times t$). This latter concept is the motion distance.

4. For example, assume an object emits light directly towards an observer on Earth, moreover, is located 300,000,000 (x) distance away from Earth as physically measured by a given length of matter $(x) =$ a measuring stick distance. →This definition of distance **includes** the measuring stick distance.←

Scenario 1: If the light travels through this given measuring stick distance (space/ether) in one second, its velocity with respect to that observer is then 300,000,000 x per second. Furthermore, if the same observer moves from Earth towards that object at 1 (x) per second, it will then take a person 300,000,000 seconds to get there ($d = r \times t$).

Scenario 2: If the observer's rate of time slows by one-half, the →fixed movement← of light then travels that same measuring stick distance in one-half second or 600,000,000 (x) per second. Additionally, if that observer travels to that object with the same →slower time frame← as compared to Scenario 1, then that observer will be moving towards the object at 2 (x) per second; moreover, it takes 150,000,000 seconds to get there. The observer will perceive the distance to that object as one-half the distance compared to Scenario 1 ($d = r \times t$) for the same observer with the other rate of time.

Scenario 1: (300,000,000 (x) per second) equated to (1 (x) per second).

Scenario 2: (300,000,000 (x) per half-second) equated to (1 (x) per half-second).

Pertaining to the reference frame of Scenario 2 above: for both the light and the observer traveling with per unit of time of one second, they move at twice the physical measuring stick distance when compared to Scenario 1. Take note, the ratio remains constant. So, if the ratio remains constant, then from the observer's reference frame the perception of the velocity of light remains unchanged for both scenarios 1 and 2 (see below).

In other words, relative to this example, the observer's perception of the velocity of the light and his/her perception of the motion distance are both a function of the observer's rate of time. Furthermore, they are proportional (direct and inverse) to one another; moreover, counteract one another. As a result, the velocity of light remains constant for both scenarios 1 and 2, →in this example, using only the motion distance but not the measuring stick distance.← The author once again denotes that the mathematical equations of $d = r \times t$ and $\text{velocity} = d/t$ cannot be readily applied to explain this concept when using the measuring stick distance.

5. So again, distance, as calculated by a physical measuring stick, is a different concept when compared to the perception of distance as a function of motion (time) through space/ether ($d = r \times t$). Observe that the latter concept involves the rate of time, whereas the first concept does not.

→The measuring stick distance is the absolute frame (universal constant). But the motion distance ($d = r \times t$; the variable) is a function of the observer's rate of time while moving through that absolute frame←. Now, in our local rate-of-time reference frame, the two different distance concepts are mathematically equal to each other (defined/observed that way). On the other hand, with reference to a traveling observer with a different time frame →compared to ours,← they are unequal/different.

The same observer in inertial motion, instantaneously transferring from one time frame into another, then perceives both the fixed movement (universal constant) of light and the motion

distance as different (changed). In addition, for that observer, those two changing perceptions counteract one another (direct/inverse) in such a way that the velocity of light remains at (c) . Yet again, the author denotes that the mathematical equations of $d = r \times t$ and $\text{velocity} = d/t$ cannot be readily applied to explain this concept when also using the measuring stick distance.

This is because in order to describe/define motion distance ($d = r \times t$) one must incorporate the measuring stick distance (length of matter/ether). Therefore, when comparing different time frames, the unification/amalgamation of the two diverse concepts/definitions does not make any sense.

Relevant to the PFSRT, both light and the observer possess movement/motion (no time frame) through the measuring stick distance, but the perception of velocity and the perception of only motion distance are a function of the observer's time frame. In addition, in the scenario whereby the observer changes his/her rate of time (increased/decreased velocity relative to the PFSRT), then the new altered perception of velocity and the new altered perception of only motion distance always counteract one another, so, for that observer, maintaining the perceived velocity of light as (c) ($v = d/t$ and $d = r \times t$) furthermore, not by using the measuring stick distance, rather only the motion distance.

6. Notice, the author used the words "motion/movement" which have no time element. This is because the observer's time rate converts that fixed motion/movement through the ether into his/her perception of velocity and perception of motion distance (also $\text{rate} = \text{e.g., meters/sec}$). The reasoning is very abstract.

- The concept of velocity is a function of time ($v(c) = \text{distance}/\text{time}$). And "rate" is also a function of time (e.g., meters per second).

- The concept of motion distance is a function of time ($d = \text{rate} \times \text{time}$). Moreover again, "rate" is also a function of time. This is motion distance not physical length measuring distance (measuring stick distance), which has no time element.

- As a result, frequency and wavelength (motion distance) are both functions of time.

- →So, the time frame of the observer then affects these equations/concepts. It converts fixed light movement (constant) and defined fixed motion into the perception of the velocity of light ($v = \text{distance}/\text{time of observer}$) and the perception of motion distance ($d = r \times \text{time of observer}$)←.

C. The Perception of Distance, the Perception of the Velocity of Light and the Perception of the Laws of Physics

Take note yet again, motion distance and measuring stick distance are two separate concepts/things. In addition, the amalgamation/unification of the measuring distance (constant) and the motion distance changes as a function of the observer's time frame. Pay close attention as to when both the perception of motion distance ($d = r \times t$) and the perception of velocity ($v(c) = d/t$) are used together, alone, as opposed to when the measuring stick distance is also integrated.

Up to this juncture, the focus has been centered on the perception of motion distance and the perception of the velocity of light as a function of the observer's rate of time. So now let us include the perception of the laws of physics as a function of the observer's time frame.

Recall, when we calculate the speed/velocity of light/the laws of physics with instruments/experiments, we always measure/gauge it by using, in one form or another, time, $v = d/t$ and $d = r \times t$ →(only from the perspective of our local reference frame of time on Earth)←.

In our own local time frame on Earth, for the observer, all these equations/concepts correlate and make common sense. This is because it is our only reference frame for the rate of time. We, at present, have no ability to change our own local time frame and then measure the speed/velocity of light using the laws of physics from that other frame. Therefore, we define

the above concepts (equations) from our observations only within our own specific local frame of time.

Alternatively, with respect to PFSRT, an observer at high velocity relative to the PFSRT will have a slower rate of time, a different time frame. Consequently, relative to that scenario, moreover, with reference to the above equations/concepts, everything changes. Observe, with respect to this new scenario, all together they do not make common sense explicitly by incorporating the measuring stick distance. So one cannot easily define/describe this theory by using the above standard classic concepts/equations of ($d = r \times t$), ($v = d/t$), and also the measuring stick distance, particularly when contrasting dissimilar observer time frames.

To recap, with respect to our local reference frame of time, for the observer, motion distance and measuring stick distance correlate with one another (defined/observed that way). Then, regarding a person/observer with a different time frame, \rightarrow compared \leftarrow to our local frame, motion distance and measuring stick distance then segregate. So regarding that non-local observer, the laws of physics/velocity of light would differ \rightarrow compared \leftarrow to our local perspective, not by using the motion distance alone, rather in conjunction with the use of measuring stick distance (Project Serpo).

This conception is extremely abstract/confusing. Consequently, for further clarification, it will be re-explained from a different perspective. For example, the mathematics of Kepler's laws uses time, distance, and velocity in their equations (or their derivatives). Regarding our local time frame on Earth, motion distance and measuring stick distance are equal to one another (observed/defined that way). This is our local frame of reference. So, in this instance, Kepler's equations make common sense, moreover, represent reality from this specific perspective. Alternatively, for an observer with a different time rate \rightarrow compared \leftarrow to our local frame, motion distance and measuring distance then differentiate. So, one cannot utilize these equations to describe this second scenario especially when \rightarrow comparing \leftarrow them to our local time frame. A totally different mathematics would be necessary.

For that reason, conceivably, if one could travel to a distant planet orbiting a star whereby that planet had a slower time frame compared to our local frame, Kepler's laws would be different (Project Serpo). **Just as we on Earth (observer) presume motion distance and measuring stick distance are equal as a function of our local time frame observations, the individual on that other far planet will define/observe motion distance and measuring stick distance as the same from his/her reference frame (a different rate of time).** So compared to our Earth frame, Kepler's equations would still be the same, but the mathematical numerical values and geometry would then differ.

Bear in mind that some of the examples described above involve gravity, therefore, not compatible with SRT/PFSRT which involves only inertial motion. It is only presented to show the correlation between the observer's time frame with the idea/perception of how motion distance and measuring stick distance relate to each other (from his/her time frame perspective).

Now, regarding the movement of light (specific to GRT) $v_{is-\hat{a}}-v$ is its perceived velocity, as a partial explanation, and the author emphasizes partial, an observer viewing light emitted/traveling towards him/her from a massive astronomical object perceives that light as $<c$. This effect is, in part, a function of that observer's rate of time. Again, the time frame of the observer partly determines the observer's perception of the light's velocity ($<c$) even though the absolute velocity of light is a fixed universal constant (c) (based on GRT using only mathematics with no observational proof—we observe the velocity of light as $<c$ but presume, without actual experimental or observational proof, it is a constant (c) \rightarrow using only mathematics \leftarrow).

For future reference regarding this chapter (relevant to only PFSRT), the velocity of light (c) and the laws of physics are the same in all inertial frames \rightarrow based upon only the

mathematics← of both motion distance and the perception of velocity, moreover, **not** with the use of measuring stick distance. Basically, it is only a mathematical equivalence similar to the example given as presented on the previous page using GRT regarding the velocity of light. **The above assumption is just like the example whereby the speed of light emitted from a massive astronomical object as observed far from that object = $<c$ but assumed to be (c) (the constant) if both the observer and light were in the same reference frame (only mathematically using the equations of GRT).**

It is even more complicated, since the original definition of a meter was as measured length of matter with no time factor (measuring stick distance). Presently, a meter is defined as $1/299,792,458$ of the distance light travels in a vacuum in one second, again a function of rate of time (motion distance). In the author's opinion, this new redefinition of a meter involving time (motion distance) rather than physical length of measured matter (measuring stick distance) is a fundamental error, moreover, a key concept regarding the understanding and acceptance of this new theory (PFSRT).

For the reader, here is a key query: regarding the equations of Einstein's SRT, is the mathematical distance symbol used equivalent to the motion distance, the measuring stick distance, or both? In the author's opinion, Einstein incorrectly intermingled the two distinct concepts/definitions—a fundamental miscalculation.

D. Further Clarifications including How the Above Concepts Relate to SRT and PSRT

Now, referring back to our "n" and "s" astronaut example. When n and s travel to object O, both travel through the same measuring stick distance (ether), moreover, with identical →fixed motion←. However, n and s possess different rates of time. Their perception of that same measuring stick distance then differs. So s perceives a shorter motion distance than n. Nevertheless, the physical measuring stick length/distance relevant to the astronaut's physical bodies (n and s) remains constant, independent of their individual rates of time.

In summary, only the →perception← of distance (the motion distance) changes as a function of the astronauts' differing rates of time. In contrast, given the same scenario, the measuring stick length/distance of their physical bodies and the ether (space) in the direction of motion does not change/contract.

What is more, if object O admits light, at a given frequency, then s perceives a shorter wavelength compared to n, because of the number of light waves observed per second by (s) $>$ (n). In other words, each of the astronauts overall observes the exact same total number of light waves, but s observes more per second than n, because for s, the "time frame" is slower.

PFSRT differs considerably compared to the above example, wherein both astronauts possess equal velocities (motion), although different time rates. That example was only used to simplify how the rate of time of the observer correlates to motion distance through space (ether) as well as the perceived—and perceived is emphasized—velocity of light.

In contrast with reference to PFSRT, given that both B and C possess different velocities relative to the PFSRT, they then possess different relativistic inertial masses ($C > B$), moreover, different rates of time (C slower than B), thus different perceptions of only motion distance (C distance $<$ B), all as a function of their different velocities with respect to the ether (PFSRT).

For reinforcement once again, please refer to Figure 1.9 below and the following captions and paragraphs.

Given the existence of the ether (box), now shift the focus away from observer A to observers B and C.

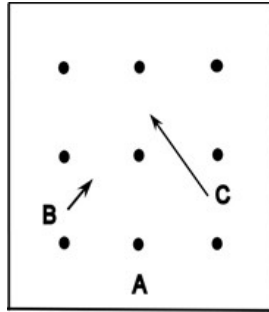


Figure 1.9 Rest Mass, Inertial Mass, and Relativistic Inertial Mass

Recall, B and C have increased velocity relative to the ether of PFSRT (C velocity > B = length of arrows), therefore, increased relativistic mass (C > B) and a slowing in the "rate of time" (C "time frame" slower than B).

Therefore, from the positions of B or C, which is from the reference frame of a velocity relative to the ether (PFSRT), his or her perceived motion distance to any given object at rest with the PFSRT is directly proportional to each individual's rate of time (C motion distance < B).

So, as a result of this proportional interrelationship, (t/d) then for all observers, regarding all inertial frames, notwithstanding their different rates of time, the velocity of light remains at (c). This is a function of $v(c) = d/t$ and if t/d remains proportional, then (c) is constant (*not using the measuring stick distance*).

In addition, assuming that the PFSRT is the preferred frame for light, then for C and B as the perceived motion distance to any object decreases (C < B), relative to A, then the observed wavelength of light emitted from that object to C and B also decreases proportionally (C wavelength < B wavelength < A).

In summary, here is a crucial concept, for all inertial observers, irrespective of their different rates of time, the speed of light remains at (c) and the laws of physics are identical within all inertial reference frames (using only $v(c) = d/t$ and $d = v \times t$ but not the measuring stick distance), just like Einstein's SRT, except now, as a function of **the ether**.

A major distinction between the two theories (SRT, PFSRT) is that regarding SRT, by definition, the main focus is the assumption that the velocity of light is (c) relative to the observer (c constant in empty space). Whereas, with PFSRT, the key concept is the observer's rate of time as a function of that observer's velocity with respect to the ether of PFSRT, which in turn again produces (c) relative to the observer (*not using the measuring stick distance*). **Note both theories revolve around the observer, but PFSRT has a preferred frame other than the observer, the ether (PFSRT).** See Figure 1.10 below for a summary.

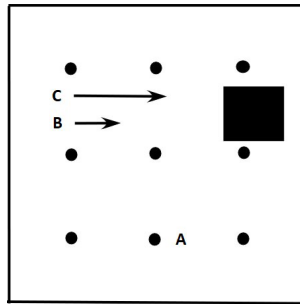


Figure 1.10 Summary

- Length of arrows depicts velocity relative to the ether of PFSRT.
- Black box = an object at rest with the ether.
- B and C (observers) both exist at a high velocity relative to the PFSRT, with $C > B$.
- Assuming the new model, then B and C, as a function of the ether, also possess higher relativistic inertial masses ($C > B$) compared to the rest mass of A.
- In addition, B and C, again as a function of the ether, manifest a slower "rate of time" (C slower than B) compared to A.
- Given that the rate of time and motion distance are directly proportional ($d = r \times t$), for any single given object in the universe (black box), B and C then perceive less motion distance ($C < B$) compared to A.
- Furthermore, the observed wavelength of light from an object (black box) can change for (A, B, C).
- However because the rate of time is directly proportional to motion distance ($d = t \times r$) and inversely proportional to perceived speed ($v = d/t$) the velocity of light remains at (c) for (A, B, C), irrespective of their different rates of time, and the laws of physics remain the same within all inertial reference frames (A, B, C) using **only** the mathematics of both motion distance and perception of velocity (not in tandem with measuring stick distance).
- This new model (PFSRT) demonstrates most of the outcomes of Einstein's SRT; however, now there is **the ether**.
- In the author's opinion, there must be some sort of mathematical constant (like the gravitational constant G) related to the perceived movement of light through the PFSRT as a function of the observer's rate of time frame, thus producing a constant velocity of (c) for that observer, regardless of the observer's time frame (without the use of the measuring stick distance). In addition, there would be two universal constants = the movement of light with no time element and the measuring stick distance (length).
- This mathematical constant should involve (c) but also the observer's rate of time.

1.6 Visualizing SRT vs. PFSRT

See Figure 1.11 below. SRT's four-dimensional space-time is a mathematical construct; therefore, one cannot readily visualize it with reference to three-dimensional space. Alternatively, using PFSRT, it is comparatively easy to do so. For instance, picture in your mind a cube with the inner part representing all of space/ether/universe/ PFSRT. For purposes of this illustration, this cube represents the three-dimensions of the universe (PFSRT) but in the real universe without walls. Fundamentally, in the real universe, the dimensions are up-down, left-right, and forward-backward.

Next, imagine an observer possessing a velocity relative to and within the cube depicted by the arrow. Recall, the faster his/her velocity (length of arrow), the slower the observer's "rate of time." In effect, the velocity of the observer determines that individual's "reference frame of time." So the arrow then represents the temporal fourth dimension (time).

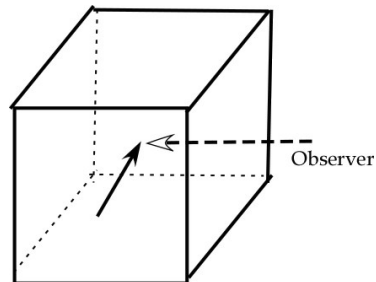
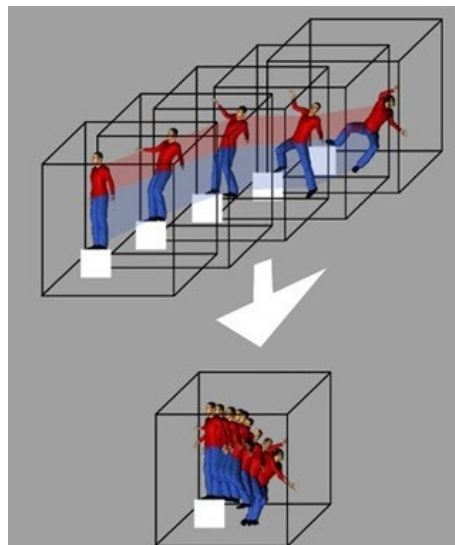


Figure 1.11 The cube has three dimensions. The arrow is the fourth dimension.

Now with reference to Einstein's SRT, is the fourth dimension mathematically perpendicular/orthogonal to the other three dimensions as shown above? That is the mathematics of SRT.

Depicted in Figure 1.12 is another 3-D presentation of 4-D space-time.



Sahil Kulbhaskar*

*<https://www.quora.com/If-fourth-dimension-is-true-how-could-one-draw-the-fourth-axis-perpendicular-to-the-other-3-axis-3d>

Figure 1.12 Einstein's Snapshot [Fair Use]

• "Einstein's theory of special relativity postulates that space and time are related to each other in forming a space-time continuum of three spatial dimensions and one temporal dimension. It is still possible to visualize space-time simply by treating time as 'time' and examining 'snapshots.'"

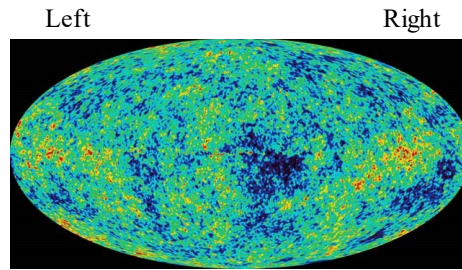
Quora.com

Observe, the series of snapshots in Figure 1.12 is analogous to the arrow in Figure 1.11 (movement).

1.7 The Real Universe

Please, now refer to Figure 1.13 below and the following discussion.

However, the information just presented is not that simple. The cosmic microwave background radiation (CMBR) observed from Earth has an anisotropy of approximately 378 km/sec in the direction of the constellation Leo.



NASA

Figure 1.13 Cosmic Microwave Background Radiation [Fair Use]

This image shows the cosmic microwave background radiation, which is almost, although not completely, uniform. The difference in color is equal to about 1 in 100,000. This radiation is at rest with the PFSRT.

This radiation permeates uniformly all of the ether (PFSRT), or in classic terminology, all of the space of the universe. In addition, it is assumed to be at rest with respect to the PFSRT. Furthermore, it expands symmetrically along with the expansion of the universe (ether). Nonetheless, there are some minimal fluctuations; although they are fairly evenly distributed as portrayed in Figure 1.13 by the different colors/shades.

Now, please refer to Figure 1.14 below and the following discussion.

The redshift of the CMBR, as observed from Earth, represents our velocity relative to the PFSRT. This is due to the fact that the CMBR is at rest with the PFSRT. This observed redshift from Earth is the summation of the velocity of the galaxy, velocity of the Sun around the galaxy, and the velocity of the Earth around the Sun, all relative to the PFSRT (Figure 1.14). Recall again, this chapter ignores gravitational fields, which will be discussed in Chapter 2.

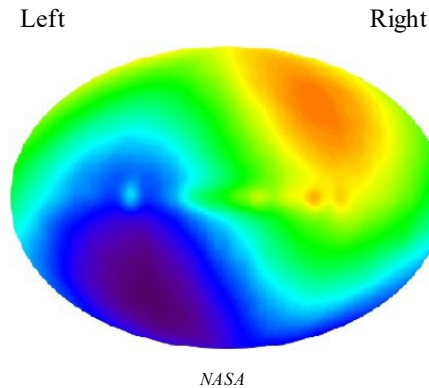


Figure 1.14 Redshift and Blueshift [Fair Use]

The Earth has a velocity of 378 km/sec relative to the cosmic microwave wave background radiation (PFSRT). This is represented by redshift in one direction (Right) and a blueshift in the opposite direction (Left) as depicted above.

What this signifies is that we on Earth are not absolutely at rest with the PFSRT. It means we possess a velocity of 378 km/sec relative to the PFSRT. This is extremely slow compared to the speed of light, nevertheless, not zero. Additionally, it is also presumed that the majority of the galaxies, although not all, have a fairly low velocity with respect to the PFSRT. So they, as we, are almost at rest with the PFSRT.

To recap, in the vast universe, an observer (A, B, C) is either at rest or else at a velocity relative to the PFSRT. As such, each observer (object) is associated with a specific inertial mass and a given rate of time, both as a function of his/her velocity with respect to the PFSRT. In addition, an individual's perception of the motion distance to any given point in the universe is dependent upon his/her time frame. Furthermore, for all observers, no matter what their velocity relative to the PFSRT, they still perceive the speed of light as c , not using the measuring stick distance.

What is more, the observed wavelength of the light emitted from any object in the universe is a function of the observer's velocity (rate of time) relative to the PFSRT, the object's velocity (rate of time) relative to the PFSRT, the intrinsic wavelength of emitted light from the object, and finally, the relative velocities of the observer and object with respect to each other.

As for the latter, this explains why light emitted from an object traveling towards the observer is blueshifted, whereas light from an object traveling away appears redshifted. This is defined as the classic longitudinal Doppler effect.

This is analogous to the sound emitted from a truck that approaches you, passes, and then recedes from you. The pitch of the sound drops as it passes you by. The higher-pitch sounds represent sound waves piling up as it approaches you (blueshift). And the lower pitch represents sound waves stretching out (redshift) as the truck passes and subsequently recedes from you. To most individuals with a minimal scientific background, it is obvious that there is a preferred frame for sound, which in this case, is the atmosphere.

Likewise, considering this new theory (PFSRT), the exact same function occurs, but this time regarding light, with a preferred frame of the ether. What is interesting is this: in the past, this analogous relationship and connection was far easier for the non-physicist to assume, since they did not understand SRT. As for the physicist, the similarity was clear but obscured

by the complexities and mathematics of SRT. Therefore, this obvious interconnection was then ignored.

1.8 SRT vs. PFSRT

1. SRT assumes that all inertial motion is \rightarrow relative to the observer \leftarrow .
PFSRT presumes all inertial motion is \rightarrow relative to the PFSRT \leftarrow .
2. SRT assumes, that \rightarrow relative to the observer \leftarrow , as the velocity of an object increases linearly, its inertial mass increases by an LT function. In addition, \rightarrow relative to the observer \leftarrow , the velocity of the object cannot exceed (c).
PFSRT presumes that \rightarrow relative to the PFSRT \leftarrow as velocity of an object increases linearly, its inertial mass increases by an LT function. Furthermore, \rightarrow relative to the PFSRT \leftarrow , the velocity of the object cannot exceed (c).
3. SRT assumes, that \rightarrow relative to the observer \leftarrow , as the velocity of an object increases linearly, its "rate of time" decreases by a LT function.
PFSRT, presumes that \rightarrow relative to the PFSRT \leftarrow as velocity of an object increases linearly its rate of time decreases by an LT function.
4. SRT assumes that \rightarrow relative to the observer \leftarrow , as an object approaches the speed of light, distance in the direction of motion, including physical length contraction of matter, decreases, (see Figure 1.15 below).

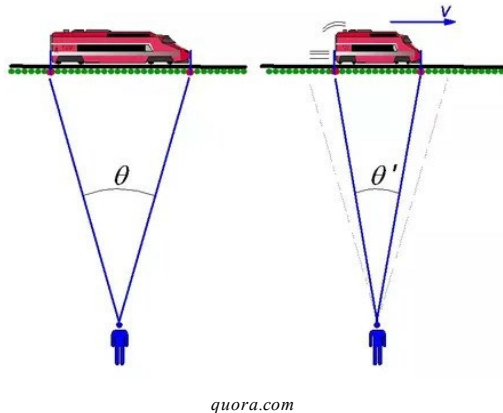


Figure 1.15 Length Contraction with Two Trains [Fair Use]

The illustration shows that relative to the observer, as an object approaches the speed of light, its physical length contracts.

\rightarrow PFSRT, presumes that *only the perception of motion distance* through space (ether) in the direction of motion decreases as the observer's velocity increases relative to the PFSRT. It does not *posit physical length contraction of matter* in the direction of motion (measuring stick distance). \leftarrow

5. SRT assumes the speed of light is always (c) \rightarrow relative to the observer \leftarrow (c constant in empty space, regardless of the rate of inertial motion). In addition, it also presumes there is no preferred frame; thus all motion is relative. Therefore, the laws of physics are the same in all inertial reference frames.

PFSRT presumes there is a \rightarrow preferred frame of the ether \leftarrow (the medium where light travels), wherein the movement (no time element) of light travels at (c for the observer's time

frame—using only mathematics). Furthermore, for all observers, no matter what their velocity relative to the PFSRT, they still perceive the speed of light as c , and the laws of physics are the same in all inertial observer reference frames (once more using only the mathematics of motion distance and the perception of velocity—without employing the measuring stick distance).

1.9 Resolution of the Paradoxes and Inconsistencies Associated with SRT

SRT – the twin paradox problem.

Einstein's SRT assumes all inertial motion is relative. For example, imagine two astronauts (A and B) traveling in the far regions of outer space where nothing else exists, moreover, in opposite directions with respect to one another. Therefore, assuming SRT is correct, if astronaut A travels at $0.5c$ relative to stationary astronaut B, then this is no different compared to if astronaut A is stationary and B is traveling in the opposing direction, again at $0.5c$.

Now, given the postulates of SRT, furthermore, as these astronauts pass by each other, with respect to their different inertial frames, A observes B as having increased inertial mass and a slowing in the "rate of time" and B vice versa. This is nonsensical, for by logic, both scenarios cannot be correct. In contrast with reference to PFSRT, there is no twin paradox conundrum, because there is a preferred frame—the ether.

Regarding the resolution of the twin paradox problem, the author does not concur with the classical SRT explanation given by physicists, whereby acceleration and a gravitational field are evoked. In the author's opinion, since SRT involves only inertial motion, the answer to the paradox cannot be a function of gravity or acceleration, which is what physicists attempt to do, an erratum.

This new nonclassical portrayal of the twin paradox problem offered by the author better illustrates the conundrum, furthermore, devoid a solution relevant to the assumptions of SRT. Again, it can be explained with the presumption of an ether (PFSRT): there is then an alternative explanation absent symmetry, because there is a preferred frame (PFSRT).

SRT – the simultaneity problem.

From the Physics Forums website: "In special relativity, the relativity of simultaneity is explained with the following example. We have one frame of reference, a train moving from left to right with constant speed (v) relatively to the embankment, and a second frame of reference, the embankment itself. On the embankment, there are points A and B and their midpoint M.

"On the train, there is the point M'. When M and M' meet each other, two bolts of lightning strike both A and B. The observer on the embankment sees that the two flashes of light meet at the midpoint M. But since the train is moving and the point M' with it, M' moves towards B and therefore, the observer on the train will see that the beam from B will arrive first at point M' and after that will arrive the beam from A. And so simultaneity is relative—for one observer the two events are simultaneous, but for the other, they are not."

So as presented above, referring to various diverse inertial frames, the perceived timing of events is different. In contrast, if there is a preferred frame (not the observer), with an ether wind, then the above classic example can be explained by another methodology.

For instance, in the scenario where there is a relative ether wind with respect to the Earth-centered frame ECF/Earth's gravitational field EGF/ether, then as a result, neither the observer of reference frame M or M' receives the flashes simultaneously. This is because the observer of frame M and the two lightning bolts possess the same velocity relative to the ECF/EGF/ether as a consequence of all three rotating synchronously along with the spinning Earth at its surface. This is assuming the train is traveling west-east and the flashes of lightning are in front of and behind the train; then it takes light longer to travel west-east compared to east-west.

On the other hand, the observer of frame M' possesses a different velocity with respect to the ECF/EGF/ether given the fact that, while riding on the train, M' is then traveling at a greater velocity with respect to the rotating surface of the Earth. As a result, M' velocity relative to the ECF/EGF/ether is greater than M . Therefore, the time interval of the asynchrony of the observed lightning bolts is greater for M' compared to M .

This alternative explanation of simultaneity as a function of the relative ether wind will be much clearer after reading chapters 2 and 3 of this publication and referred to again at that time.

As with all theories, given sufficient time, Einstein's relativity will eventually be overturned. And when it is, the whole world will wonder why these inconsistencies were ignored; nevertheless, the theory is still accepted, without question, as absolute gospel truth.

Notice, all the inconsistencies of Einstein's SRT vanish if its assumptions are modified with PFSRT. This modification includes a single preferred frame for the speed of light, motion of objects, rest inertial mass, and finally, the rate of time, other than from the frame of the observer.

1.10 Lorentz Theory

Lorentz posited a theory with a stationary luminescent ether, somewhat similar to PFSRT with (c) relative to that ether and \rightarrow physical \leftarrow length contraction of objects (matter) in the direction of motion. In addition, this contraction is postulated to be a function of an object's velocity relative to a preferred frame (ether) and not with respect to the observer. (Figure 1.16 below.)

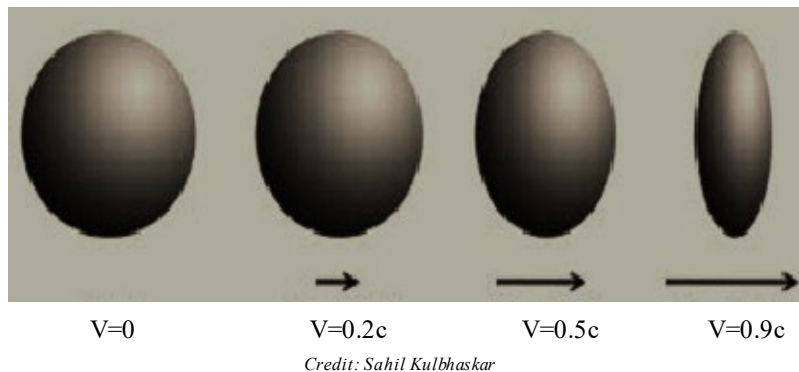


Figure 1.16 Length Contraction, Different Speeds [Fair Use]

Relative to the preferred frame of the ether, as an object approaches the speed of light, its physical length contracts.

However, Lorentz's length contraction of actual physical objects has never been experimentally observed so remains unproven. In contrast, PFSRT presumes perceived distance, through space/ether in the direction of motion, decreasing or increasing as an effect of the observer's rate of time, which in turn, is a function of that observer's velocity relative to a preferred frame (PFSRT). The key point is perceived motion distance through space, not physical length contraction of objects (measuring stick distance) in the direction of motion. PFSRT is more intuitive and logical, in essence, more consistent with common-sense reality. So given SRT, Lorentz theory, and PFSRT, which theory is more compatible with reality and Occam's razor?

1.11 Conclusion

PFSRT is extremely abstract/bewildering. For that reason, this conclusion is divided into two parts. After evaluating, moreover, comprehending the first part, apply the principles presented to the second part.

Part 1

As referred to numerous times, this new theory (PFRST) cannot be explained by using the classic mathematics of $d = r \times t$ and $v(c) = d/t$, because motion distance (variable) and measuring stick distance (constant) are two different things.

This concept is extremely puzzling, because in order to describe/define motion distance, one must incorporate the measuring stick distance. Consequently, for the observer, when comparing different observer time frames the amalgamation of the two definitions/concepts does not make common sense (perhaps abstract sense but not common sense).

So as the result of this dichotomy, moreover, regarding PFSRT, then (c), relative to the observer and the laws of physics, are the same in all inertial frames by using only the mathematics of motion distance but not in tandem with the use of measuring stick distance. The author chose to present it this way for ease of understanding/comparison (SRT vs. PFSRT). PFSRT would be expressed by a new mathematical theory with two universal basic constants = the measuring stick distance and the fixed movement of light with no time factor which are nontemporal-related entities (both are actual physical structures derived from the ether as depicted earlier in this chapter and the following chapters 2 and 3).

Once again for emphasis/reinforcement, all experiments/observations regarding physics that have ever been performed are a specific function of our own local frame of time. Mankind has never performed any experiments/observations from the perspective of a different time frame.

Now assuming motion distance and measuring stick distance are two distinct independent things, as posited by this book, then with reference to observers/physicists performing physics within different rates of time, the equations/concepts will be identical between those frames; however, the numerical values/geometry will differ. This is the reason why one cannot utilize/compare/comprehend $v = d/t$ and $d = r \times t$ between dissimilar time frames (again when using the measuring stick distance).

With respect to Part I, the three pertinent concepts the author wishes to convey are:

- Motion distance ($d = r \times t$) and the measuring stick distance (length of measured matter/ ether) are two different things/concept. Therefore, just as we, within our own specific time frame, presume/define motion distance and measuring stick distance as equal, a function of our local time frame observations, an individual existing within another time frame will define/observe motion distance and measuring stick as the same from his/her reference frame (a different rate of time). So, when comparing diverse observer frames of time, the velocity of light and the laws of physics will differ explicitly when incorporating the measuring stick distance. On the other hand, by only using the mathematics of ($d = r \times t$ and $v = d/t$) without integrating the measuring stick distance, then the velocity of light and the laws of physics are the same within all disparate inertial frames → this is only a mathematical equivalence and not real ←.
- SRT and GRT are only proven/observed from our local specific time frame, furthermore, only assumed to be correct in other frames of time not by observation/experimentation but rather with the use of only the mathematics of relativity. In essence, there is no observational/experimental proof vis-à-vis different observer time frames that SRT is correct.

- Relevant to PFSRT (Chapter 1) and PFGRT (Chapter 2), because motion distance and measuring stick distance segregate between different time frames, one cannot describe/define this new abstract theory via present-day mathematics.

Part 2

Now please apply the above principles to Part Two as now provided below.

As stated in the preface, this new visual theory (PFSRT) combines Galilean transformation theory and Newton's theories (three-dimensional space) with Maxwell's EM theory (velocity of light of (c) relative to the observer) without altering either of them but now from the rest frame of the ether of (PFSRT) not the observer (SRT).

Fundamentally, Einstein's synthesis had to choose between Maxwell vs. Newton and Galileo. He either had to modify Maxwell's theory to make it compatible with the Newton and Galileo theories or vice versa. He chose the latter. This new theory (PFSRT) accomplishes almost the same outcome as SRT but now from the frame of the ether rather than the observer (SRT = (c) constant in empty space irrespective of the observer's velocity), furthermore, visually, not mathematically.

Conceiving all this from a different point of view, regarding Einstein's SRT by definition (c) is relative to the observer (constant in empty space). As such, the focus is on (c) , and all else (time and distance) revolves around this basic assumption, moreover, by using purely mathematical means.

Alternately, *vis-à-vis* the new PFSRT, the crucial concept is the observer's velocity relative to the physical ether of PFSRT (the medium where light travels within). In other words, there exists a preferred frame (PFSRT), but regarding that frame, both the *perception* of motion distance and the *perception* of the velocity of light are an effect of the observer's time frame, which in and of itself, is a function of his/her velocity relative to the PFSRT.

And as previously explained, if the observer's rate of time and his/her perceived motion distance are directly proportional to one another, as well as inversely proportional to the perceived speed of light, then the velocity of light always remains at (c) for all inertial observers ($d/t = (c)$ or $t = d/c$) irrespective of the observer's time frame (not using the measuring stick distance).

In addition, assuming PFSRT is apropos, then, the observer's rate of time (velocity relative to the PFSRT) proportionally and equally effects the perceived laws of physics, a gain pertaining to all inertial frames (using, again, only the mathematics of both motion distance and perception of velocity and not the measuring stick distance). Thus, regarding PFSRT, as with SRT, the laws of physics are the same in all those frames.

Notice, both theories are from the viewpoint of the observer (SRT and PFSRT). With respect to SRT, (c) is relative to the observer (c in empty space) irrespective of different observer inertial frames. Accordingly, there is no preferred frame. Then again, concerning PFSRT, the observer's perception of (c) is related to his/her velocity relative to a preferred frame (PFSRT) (not using the measuring stick distance).

In a nutshell, here is the critical difference: With SRT, (c) is constant in empty space (= (c) relative to the observer of SRT) and the laws of physics are identical in all observer inertial reference frames, but with PFSRT, all is ultimately a function of the ether.

In other words, as opposed to that SRT example which was presented at the onset of this chapter (Amber and you), where the assumption of (c) from the observer's frame, determines time and distance ($c = d/t$), but only as a mathematical function, with no corporal attribute as for why, PFSRT alternatively posits that the speed of light is actually a product of a true three-dimensional physical ether (PFSRT).

1.12 Epilogue

After completing Chapter 1, the author recognized that the novel concepts as just presented above in this chapter are very intricate, abstract, and confusing, especially the idea of distance. So, in order to clarify the new theory (PFSRT), a re-explanation from a more thorough perspective is now offered.

The primary purpose of this epilogue is to demonstrate to the reader the interrelationship/connection of the measuring stick distance and the motion distance, both as a function of the observer's time frame. To be more specific, this sequel will show how the overall interconnection relates to the observer's \rightarrow perception \leftarrow of the velocity of light and his/her \rightarrow perception \leftarrow of the motion distance applicable to the new PFSRT. However, before appraising the following section, for ease of comprehension, one must understand the concepts/lexicology as just conveyed in Chapter 1; otherwise, it will be very difficult for one to appreciate the meaning/relevance of this postscript.

Einstein's SRT assumes there is no preferred frame, moreover, no ether, so all-inertial motion is relative. In addition, the theory assumes (c) is relative to the observer (c constant in empty space) regardless of the observer's rate of inertial motion. Therefore, with respect to the observer, as a function of an object's velocity, its (object) distance and time change (direct/indirect/LTF), nevertheless only mathematically centered on (c). Accordingly, for all that above, the laws of physics are identical within all inertial reference frames. **It also posits there is no distinction between the measuring stick distance (physical length of matter, i.e., ruler) and the motion distance ($d = r \times t$), as a function of the observer's rate of time.** Alternatively, PFSRT posits there is the ether (preferred frame). Furthermore, it is the resistance derived from the ether to the acceleration of objects/matter/observer that gives rise to inertial mass and the rate of time. This concept was previously explained and illustrated in the beginning of Chapter 1 and can be easily understood/visualized.

However, the difficult part to grasp is how the observer's rate of time (velocity relative to the ether) correlates to that observer's \rightarrow perception of motion distance \leftarrow . This is because **PFSRT, as opposed to SRT, posits that the measuring stick distance and the motion distance ($d = r \times t$) are two distinct things.** This is a core difference between the two theories (PFSRT vs. SRT). Fundamentally, in order to appreciate how the two theories differ from one another (PFSRT vs. SRT), this one key factor must be accepted.

In all probability, it is very challenging for the average individual to understand how the measuring stick distance (physical length of matter, i.e., ruler) and the motion distance ($d = r \times t$; = a function of time/motion) in conjunction with one another relate to the observer's time frame vis-à-vis his/her *overall perception* of the concept of distance. Therefore the author presents the following 18 disparate attributes, which, when woven together, give explanation to this concept. The ideas portrayed below focus primarily, but not exclusively, to PFSRT rather than SRT. Even so, both SRT and GRT are referred to and labeled in the attributes (see directly below).

Bear in mind, that before proceeding, some of the following attributes depicted involve gravity/gravitational field, therefore, not specific to PFSRT/SRT. The author has composed it in this manner for simplicity of explanation as to how the measuring stick distance and the motion distance relate to each other as a function of the observer's time frame, which for the latter, in the specific case of PFSRT, is a function of the observer's velocity relative to the ether (PFSRT). Gravity/gravitational field will be deliberated in Chapter 2 (**PFGRT**).

Here are the 18 disparate attributes.

1. One way to determine the distance to the closest stars is by observing their changing orientations whenever the Earth is located on opposite sides of the Sun compared to other illuminating objects which are sited exceedingly distant from the Sun (i.e., galaxies/quasars). As a result, by using trigonometry, one can then calculate their distance. This is a measuring stick distance.

2. In the same manner, one can calculate the distance to the planets and Sun by using trigonometry, again a measuring stick distance,

3. In contrast, the motion distance is a function of time ($d = r \times t$), or in the case of light, the equation is ($d = c \times t$). This is not the same concept as the measuring stick distance (physical measured length of matter). They are two separate entities.

4. When the speed/velocity of light was calculated by using the occulting orbiting moons of Jupiter (R"omer), the trigonometric measuring stick distance was correlated to the time divergence of occultation as a function how far the Earth was from Jupiter, as both revolve about the Sun in different orbital patterns. This determination then gave the value for the speed of light. Take note, the time frame used was only from the specific reference frame of the observer on Earth.

5. In addition, all speed of light experiments, performed on Earth, always correlate the measuring stick distance with a given observer rate of time (e.g., Fizeau and Foucault), which for us (observer) is again the local frame of time on the Earth's surface. In essence, with respect to the observer situated on Earth, there is no other time frame possible.

6. Fundamentally, from our Earth reference frame, we incorporate the measuring stick distance into the equation of ($d = r \times t$). We observe and define it that way for this is our only frame of reference (our observations). In effect, on the surface of the Earth, we (observer) are confined to and trapped within this specific time frame. →The measuring stick is the constant whereas the motion distant distance varies as a function of the observer's rate of time/motion←.

7. However, if we (observer) could, in fact, change our Earth frame of time, we would then incorporate the constant (measuring stick distance) with this new time frame relative to the equation ($d = r \times t^*$). The t^* represents the new time frame, which is the variable.

As a result, the equations would remain the same, but the numerical values and geometry would differ between those two observer frames—so the comparison between 6 and 7 is ($d = r \times t$) vs. ($d = r \times t^*$). In addition, recall rate is a function of time; therefore, the contrast between 6 and 7 is also ($r = d/t$) vs. ($r = d/t^*$).

8. On one hand, using only the mathematics of SRT where the measuring stick distance and the motion distance are indistinguishable, then with respect to and within different inertial frames, there is no difference in the velocity of light (c), and the laws of physics are identical.

9. On the other hand, vis-à-vis PFSRT, whereby the measuring stick distance and the motion distance segregate, then when comparing diverse inertial observer time frames, the velocity of light of laws of physics will diverge between those frames, because distance is defined/observed in a different way again between those frames ($d = r \times t$) vs. ($d = r \times t^*$).

10. The problem/confusion associated with PFSRT is that one cannot equate different observer inertial time frames by using the equation/mathematics of ($d = r \times t$) vs. ($d = r \times t^*$) →plus the measuring stick distance←, since, in this specific case, when the observer's rate of time changes between those frames (the observer's velocity relative to the ether), it then alters the definition of distance (therefore, the velocity of light t differs from t^*) In other words, both the notion of motion distance and the velocity of light are a function time ($c = d/t$ and $d = r \times t$). As a result, that comparison mathematical outcome between varied observer time frames then

does not make common sense, again ($d = r \times t$) vs. ($d = r \times t^*$) and ($v = d/t$) vs. ($v = d/t^*$) and (rate = d/t) vs. (rate = d/t^*), moreover, along with the use of the measuring stick distance.

11. (Specific to the mathematics of SRT) SRT presumes (c) is relative to the observer (c in empty space) regardless of the observer's velocity.

12. (Specific to the mathematics of GRT) GRT assumes a universal constant (c). Accordingly, the individual/observer perceives the velocity of (c) so long as the observer and light are in the same reference frame.

13. (Specific to the mathematics of GRT) Now, our (observer) only reference frame for the speed of light/motion distance ($c = d/t$ and $d = r \times t$) is a function of our local time frame on Earth. We have no ability to change our Earth rate of time and observe the speed of light from that other frame. We presume by using only the mathematics of GRT that the speed of light is (c) within all the different reference frames of time as long as the observer and light are in the same frame. Nonetheless, there is no observational/experimental proof that this presupposition is so. It is purely a mathematical concept/assumption.

14. (Specific to PFSRT) Alternatively, regarding PFSRT, because the motion distance and the measuring stick distance are two separate things, one cannot compare dissimilar observer time frames by using the equation ($d = t \times r$) since the amalgamation/interconnection/synthesis of the two concepts is specific to each separate time frame (divergent).

15. (Specific to PFSRT) But this also means that when comparing different observer time frames, the equations regarding the laws of physics are identical, but the numerical values and geometry are dissimilar.

16. (Specific to PFSRT and PFGRT) The moon's surface has a decreased gravitational field contrasted to Earth, therefore, an infinitesimally small faster rate of time compared to that on the surface of the Earth.

17. (Specific to PFSRT/PFGRT) Now presuppose on the surface of the Moon, that we carry out all of the speed of light experiments that have already been implemented on the Earth's surface. For that reason, one would observe a minuscule difference in the value of the speed of light compared to that on Earth, infinitesimally slower but, in fact, real. In addition, the laws of physics would also differ, not the equations, but the numerical values and geometry (e.g., $F = m \times a$). Recall the fact that those laws and the velocity of light involve the concept of distance, which changes between diverse observer time frames because the amalgamation/synthesis of the motion distance and measuring stick distance are observed/defined as different between those frames.

18. (Specific to PFSRT/PFGRT) Furthermore, by using these principles, an observer located just external to the event horizon of a black hole will then perceive the speed of light as markedly different compared to if he/she were on the Earth's surface. Furthermore, the greater the difference regarding his/her rate of time, the more the divergence of velocity. Once more, the laws of physics would also differ, not the equations but only the numerical values and geometry (e.g., momentum = $m \times v$). Again, those physical laws and the velocity of light incorporate the concept of distance, which changes between divergent observer time frames given the fact the amalgamation/synthesis of the motion distance and measuring stick distance are observed/defined as different between those frames.

The intention of this epilogue was not to reinterpret from a different perspective the entire new proposed PFSRT, but rather to specifically focus on the confusing/abstract concept of the relationship of how the motion distance ($d = r \times t$) and the measuring stick distance relate to PFSRT vs. SRT, moreover depending on those different assumptions (PFSRT vs. SRT), how the outcomes are different (PFSRT = ether vs. SRT = no ether). Therefore, after evaluating this section and rereading Chapter 1, the explanations may now be clearer. Hopefully, then,

even though the subject is still complex, one will have a better appreciation/understanding of the new PFSRT.

One more time. The following is an additional explanation of the new PFSRT, however, now with an accompanying illustration. It portrays the new PFSRT from two different perspectives as referenced below.

Perspective A

The new PFSRT, whereby only the motion distance ($d = r \times t$), a function of the observer's time frame, is used alone →without incorporating the measuring stick distance← (physical measuring length of matter = constant). This is purely a mathematical description, and its outcome (A) is somewhat similar to Einstein's SRT; nevertheless, there is now an ether. Again, →it is only mathematical concept and not real←.

Perspective B

The new PFSRT, wherein the motion distance ($d = r \times t$) is used →along with the measuring stick distance← (physical measuring length of matter). The outcome (B) of this theory is totally different compared to Einstein's SRT since the →perception← the velocity of light and the laws of physics are divergent when comparing different observer time frames; moreover, there is also again an ether. →This is the real the theory. ←

See Figure 1.17 below.

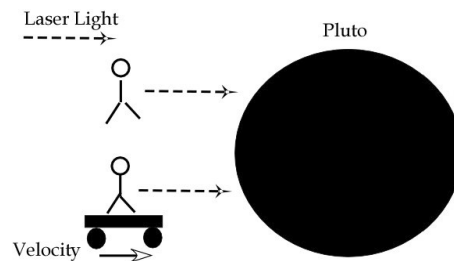


Figure 1.17

- Black circle = Pluto.
- Observer A (top) at rest with the ether (PFSRT) is shining a laser light towards Pluto.
- Observer B is on the cart at a velocity relative to the ether (PFSRT) (.7 c) again shining a laser light towards Pluto.
 - Observer A and observer B are at an equal interval of the ether (measuring stick distance) from Pluto, both simultaneously shining a laser light towards Pluto.
 - The dotted line with the hollow arrowheads represents the movement of laser light towards Pluto. Take note, the movement of light has no time element (constant); thus, the observer's time frame converts that concept of movement (constant) into his/her perception of the velocity of light.
 - Observer B's velocity relative to the ether (PFSRT) is greater than A's. Consequently, observer B's rate of time is slower than A's (time dilation) and observer B's inertial mass is greater than A's.
 - Observer B's rate of time (t^*) contrasts with observer A's rate of time (t) differentiated by the asterisk. (t^*) is slower than (t); therefore, the equations, when comparing these two different observer time frames would be ($d = r \times t$) vs. ($d = r \times t^*$), ($v = d/t$) vs. ($v = d/t^*$), and ($r = d/t$) vs. ($r = d/t^*$).
 - Observer A: Therefore, from that observer's perception/observation/definition, he/she would then incorporate the constant (measuring stick distance = length of measured matter/ether) into the motion

distance ($d = r \times t$). This equation is a function of the observer's rate of time (t). Additionally, the equation of $r = d$ (measuring stick distance)/ t is also a function of the observer's time frame.

• *Observer B:* Therefore, from that observer's perception/observation/definition he/she would then incorporate the constant (measuring stick distance = length of measured matter/ether) into the motion distance ($d = r \times t^*$). This equation is a function of the observer's rate of time (t^*). Furthermore, the equation of $r = d$ (measuring stick distance)/ t^* is also a function of the observer's time frame.

• *Observer's A time frame (t) is different from observer B's time frame (t^*). Therefore, observer (A vs. B) →perception← of both distance and velocity differs between those frames. ($d = r \times t$) vs. ($d = r \times t^*$), ($v = r/t$) vs. ($v = r/t^*$), and ($r = d/t$) vs. ($r = d/t^*$). So one cannot use the classic equations ($d = r \times t$), ($v = d/t$) and ($r = d/t$) when comparing diverse observer frames of time along with the use of measuring stick distance.*

Perspective A

The following conception (A) with reference to PFSRT uses only the equations of ($d = r \times t$), ($v = d/t$), and ($r = d/t$), moreover, **without the use of the measuring stick distance**. If so, then with respect to different observer time frames (Observer A vs. Observer B), the perception ← of the movement of light (no time element) and the →perception ← of the motion distance ($d = r \times t$) counteract one another, accordingly, maintaining the observer's →perception← that the velocity of light is c , regardless of that observer's time frame. This is only a mathematical explanation and not real←. See below.

1. (PFSRT - **distance**) The time frame of the observer and his/her →perception← of only motion distance within that same frame are →directly proportional← to one another, irrespective of diverse observer frames of time ($d = v \times t$). This is purely a mathematical concept, furthermore, not with the use of the measuring stick distance. →The author again emphasizes that this is purely a mathematical concept and not real←.

2. (PFSRT - **velocity**) The observer's time frame and his/her →perception← of velocity within that same frame are →**inversely**← proportional to one another, notwithstanding different observer time frames ($v = d/t$). This is only a mathematical construct, not with the use of the measuring stick distance. →Once again, this is only a mathematical explanation and not real←. Recall that the movement of light is a constant with no time element, but the observer's time frame (velocity relative to the ether) converts that constant movement of light into his/her →perception← of velocity, because the →perception← of velocity is a function of the observer's time frame.

3. Therefore, using **only** the mathematical equations as given above ($d = t \times r$) and ($v = d/t$) without the distinction between the motion distance and the measuring stick distance, when there is no differentiation of the perceived velocity of light between t and t^* . So regardless of the observer's time frame, his/her →perception← of velocity of light remains constant at c . Again, this is because with respect to any given observer's rate of time, Both the →perception← of distance and the →perception← of velocity (light) always interact/counteract (**direct and inverse**) with one another in such a way as to maintain the →perception← of c relative to the observer (not using the measuring stick distance). → One more time, this is a mathematical explanation and not real←.

4. In addition, the laws of physics also remain constant relevant to different observer time frames, yet again, because those laws are based upon the →perception← of distance and the →perception← of velocity, both functions of the observer's time rate as just elucidated in 3 above, whereby they counteract one another (direct/inverse), therefore, leaving those laws of physics unchanged between diverse observer time frames (not with the use of the measuring stick distance).

5. So overall, just like Einstein's SRT, PFSRT is very similar; nevertheless, there is now an ether. →This is only a mathematical explanation and not real←.

Perspective B

The following conception (B) regarding PFSRT uses the equations of ($d = r \times t$), ($v = d/t$) and ($r = d/t$) but now **with the use of the measuring stick distance**. If so, with respect to different observer time frames (Observer A vs. Observer B), the →perceived← velocity of light and the perceived laws of physics will then differ between those diverse frames of time, not the equations, but rather, the numerical values and geometry. See below.

1. Now, with respect to PFRST, whereby the measuring stick distance (constant = length of measured matter/ether) and the motion distance (a function of the observer's rate of time = variable) segregate (not the same thing), then the observer's →perception← of the velocity of light and the observer's →perception← of the motion distance will differ between various time frames ($d = r \times t$) vs. ($d = r \times t^*$), ($v = d/t$) vs. ($v = d/t^*$) and ($r = d/t$) vs. ($r = d/t^*$).

2. So, relative to perspective (B), when comparing diverse observer time frames, →perceived← motion distance (direct) and →perceived← velocity (inverse), now, unlike perspective (A), in this instance, to not counteract one another in such a way as to maintain the velocity of c , relative to the observer, regardless of their different time frames.

3. In addition, the →perceived ← laws of physics also differ when contrasting diverse observer frames of time, again, because, as in 2 above, perceived distance and perceived velocity diverge, vis-à-vis disparate observer time frames; they now, as opposed to perception A, do not counteract one another (direct/inverse). Thus, those laws of physics will vary when comparing different observer time frames (using the measuring stick distance), though in this case, only the numerical values/geometry but not the equations. **This is the real theory.**

→In conclusion, one cannot mathematically describe the new PFSRT using the equations ($d = r \times t$) and ($v = d/t$), along with the measuring stick distance, when comparing divergent observer time frames (velocity of the observer relative to the ether). An entirely new mathematics would be required beyond the capability of this author←.

CHAPTER 2

GRT/PFGRT

With respect to this and the following chapters, in order to simplify the explanations, especially for the newcomer, the distinction between the measuring stick distance and the motion distance is ignored. Otherwise, the following discussions would be so complicated, that for the average individual, it would be too confusing to appreciate, moreover, understand.

2.1 Introduction to the Preferred Frame General Relativity Theory (PFGRT)

Chapter 1 established/hypothesized the existence of ether. Chapter 2 will demonstrate how the ether relates to gravity and the gravitational field. Nonetheless, the problem with Einstein's SRT is that it involves only linear inertial motion but not accelerated motion. Consequently, the dilemma with reference to the figures presented in Chapter 1 is that the dots portraying the galaxies generate their own gravitational fields. However, this fact was ignored. This is why the observers and astronauts (A, B, C) portrayed in those figures were generally, although not exclusively, positioned outside the influence of a gravitational field (outside of the galaxies). Furthermore, their own infinitesimal intrinsic gravitational fields were also overlooked.

So, where in the universe is there no gravitational field, resulting in acceleration? In the author's opinion, the answer is, most likely, nowhere. As a result, Einstein posited GRT. Now before proceeding, if the reader is not familiar with Einstein's GRT, the author recommends a perusal of Appendix B of this book, where it is explained in much greater detail. In addition, for the beginner, the following YouTube videos would be helpful.

<https://www.youtube.com/watch?v=fEZupmpTcOU->
It is titled "Einstein's General Theory of Relativity"

<https://www.youtube.com/watch?v=6XSAVqm0XBI->
It is titled "Einstein 100—Theory of General Relativity"

GRT is even less intuitive compared to SRT, since its assumptions are significantly more mathematical. So relative to SRT, it is even less visually perceptible. Additionally, with GRT, it is mathematics first; then we attempt to make pictorial sense of it. For that reason, it is exceedingly difficult for the nonscientist individual to comprehend. Regardless, the postulates of Einstein's GRT are presented below (from online *The Physics Hypertextbook*).

1. *The absence of a gravitational field (true weightlessness) is indistinguishable from free fall acceleration in a gravitational field (apparent weightlessness).*

2. *Accelerated motion in the absence of a gravitational field is indistinguishable from unaccelerated motion in the presence of a gravitational field. The local effects of gravity are the same as those of being in an accelerating reference frame.*

In other, moreover, simpler words, gravity and inertia are equivalent, then defined by Einstein as the equivalence principle. Subsequently, he used this assumption in conjunction with the two postulates of SRT: that with respect to all inertial reference frames, the laws of physics are identical, and second, the speed of light is (c) in empty space ($= c$) relative to observer of SRT, regardless of observer velocity) to then create GRT. Essentially, GRT is an extension and modification of SRT.

2.2 Outcomes Associated with Einstein's GRT

So, by using GRT's basic assumptions, the following are 10 outcomes.

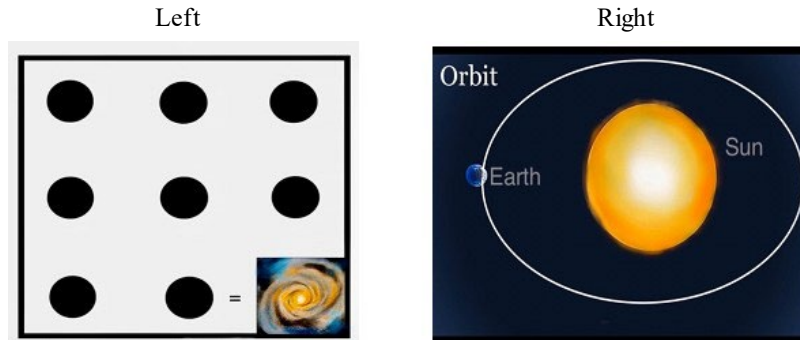
1. GRT posits that gravity is curved space-time (four-dimensional space-time).
2. GRT posits that gravity and inertia are equivalent (the equivalence principle).
3. GRT posits that due to the gravitational field, light is deflected or bent toward a large astronomical object. This function is defined as the gravitational lens effect.
4. GRT posits the existence of black holes, wherein the gravitational field is so intense that light cannot escape from its influence.
5. GRT posits that from the observer's reference frame, specifically located outside the gravitational field produced by a massive astronomical object, when a small object approaches that structure, then the object's inertial mass increases, its "rate of time" decreases, and for that object, distance/physical length in the direction of motion contracts.
6. GRT posits that from the reference frame of the observer, located outside the gravitational field produced by a massive astronomical object (star), he/she then perceives a delay of velocity of light as it travels from that star towards that observer. This is a function of a decrease in the rate of time, as well as changes in distance produced by the gravitational field (four-dimensional space-time). In addition, as light climbs out of the gravitational well due to energy loss, that light is redshifted.
7. GRT posits that while under the influence of a gravitational field, light waves undergo a redshift or blueshift.
8. GRT posits an advancement of the perihelion of Mercury's orbit, mathematically distinct, furthermore, more accurate, when compared to Newtonian physics.
9. GRT posits the concept of "frame dragging." This is where a massive, spinning astronomical object drags a minuscule portion of its nonrotating gravitational field/four-dimensional space-time (4-D S-T) into its own revolving motion.
10. GRT posits that gravity waves travel at (c).

2.3 Postulates Associated with the New PFGRT

So, exactly how does one modify the new PFSRT, as proposed in Chapter 1, in order to make it compatible with the assumptions and outcomes classically associated with Einstein's GRT? Here is the rationale. PFSRT as portrayed in Chapter 1 consists of, even though expanding, a static ether. In other words, the ether is motionless, and although it expands over time, it does not flow like a river.

Therefore, let us modify the PFSRT of Chapter 1 with three postulates presented below. For future reference, this modified PFSRT will be defined as the **Preferred Frame General Relativity Theory (PFGRT)**.

Postulate 1

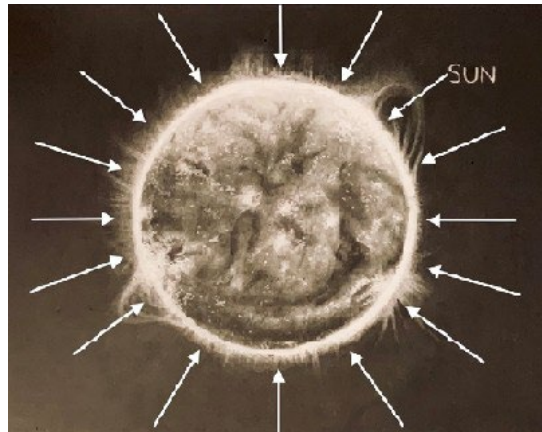


Credit: JCW

Figure 2.1 Left: Many galaxies (dots) and the ether (box); Right: Sun and the Earth

With reference to Figure 1.3 of Chapter 1 (PFSRT), let us remove all the galaxies symbolized by the dots (Left, Figure 2.1). In their place, presume only two astronomical objects: the Sun with the Earth orbiting it (Right, Figure 2.1). And so with respect to this hypothetical universe, there exists only the ether, the Sun, and the Earth. Next, let's focus only on the Sun.

Presuppose the ether (space) flows into the Sun as water flows into a sink but without rotation. See Figure 2.2 below.



Credit: JCW

Figure 2.2 Inflow of Space or Ether

The arrows depict the inflow of space or ether (gravitational field) into the Sun. This is a two-dimensional representation of the gravitational flow of Newtonian–Lorentzian, inertial–electromagnetic space into all matter. The acceleration explains the ballistic effects of gravity; the velocity explains the electromagnetic (relativistic) effects. (From Physics Essays 25 online) [Credit: Lindner]

In other words, the ether of PFSRT, after entering into existence between the galaxies, resulting in the expansion of the universe, then flows, →without rotation←, directly towards, then into, matter (e.g., Sun) and subsequently disappears. Additionally, as it flows towards the Sun, it accelerates, stretches, and compresses. Take note: →The analogy to a sink is not totally appropriate, because as water flows into a sink, it can rotate and does not compress.

Even so, the comparison is useful for visualizing the concept←.

Postulate 2

The ether flows with a velocity/acceleration. Furthermore, it carries light (electromagnetic radiation) along with its own motion, comparable to how a river transports a wave with its own flow.

Postulate 3

Matter (object) interacts with the ether at a velocity or with force of acceleration (Scenario A). Contrariwise, the ether interacts with matter at a velocity or with acceleration by force (Scenario B). Both scenarios are referred to in much greater detail in the following figures and deliberations.

(Scenario A) See Figure 2.3.

When an object travels at a velocity relative to stationary ether (PFSRT), there is no resistance effect. On the other hand, if the same object is accelerated by force, again with respect to stationary ether, there is, in this case, a resistance (force) to its acceleration, furthermore, as a function of the ether.

The primary force (e.g., rocket) is exerted upon one side of the object, moreover, initially directed at its surface atoms. This force is then transmitted to the next internal adjacent set of atoms, then again to the following set, and so on and so forth. Essentially, this series of successive interactions occurs throughout the object in the direction of the force. For future reference, this function will be termed (**linear sequential acceleration = LSA**).

Alternately, when compared to the direction of the primary force, the responding force of resistance derived from the ether is oriented in the opposite direction. Additionally, it is directed upon each atom separately within the object. This is because the ether occupies everything including the inner space of the object. In this case and for future reference, this latter concept will be termed (**individual atom resistance = IAR**).

Therefore, as a function of acceleration, the object is compacted from both the initial/primary force (LSA) oriented in one direction and the responding resistance force on individual atoms derived from the ether in the opposite direction (IAR). This bidirectional interaction of two opposing forces is the definition of both inertia and inertial mass as already presented in Chapter 1 (PFSRT).

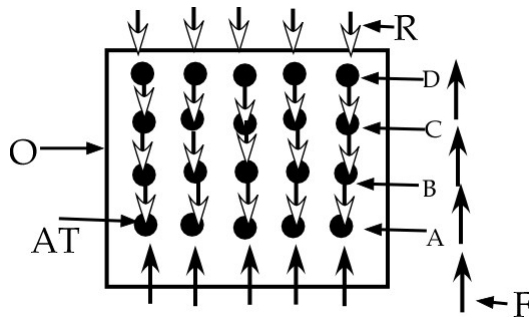


Figure 2.3 Picture of Inertia and Inertial Mass

- The square box (O) symbolizes an object made up of atoms (AT).
- The solid black arrowheads (F) represent the primary force (e.g., rocket) directed upon the object's surface atoms initially from the bottom side of O, therefore, producing acceleration.

- This primary force, starting from the bottom side of the object, is then transmitted from atom to atom, in the direction of the force, to the other side of *O*. This successive series of interactions is portrayed by the vertical line of black arrows located on the right, from *A* to *B* to *C* to *D* (LSA).
- The hollow white arrows depict the responding force of resistance to acceleration (*R*) derived from the ether, moreover, acting on each atom separately within the object (IAR).
- Therefore, between the functions of the primary force and the resistance force, the object is then compacted.
- This is a pictorial representation of inertia and inertial mass.
- Bear in mind that two forces in opposition acting separately on each and every individual atom within the object would not result in its compaction. In order for compaction to occur, at least one of the opposing forces must be transmitted from its (object) surface atoms to adjacent internal set of atoms, to the next set and so on and so forth, through the object, from one of its sides to its other side (LSA).

(Scenario B) See Figure 2.4 below.

When the ether flows at a velocity with respect to an object, there is no acceleration (force) effect. In contrast, if the ether flows with acceleration, relative to the same object, it acts upon, moreover, accelerates with force each and every atom separately within the object, now defined as **individual atom acceleration (IAA)**.

This is because, again, the ether occupies all of space, including the inner space of the object. So with reference to Scenario B as opposed to Scenario A, even though all the object's individual atoms are being accelerated, there is, in this setting, no compaction, as there is no opposing force (LSA). This unidirectional interaction represents geodesic motion (e.g., curved space–time). In addition, this is another way of perceiving exactly how a gravitational field produces an object's free–falling motion (Newton). Furthermore, it gives explanation to tidal forces, because the inflowing ether angles inwards towards a large astronomical object such as the Sun.

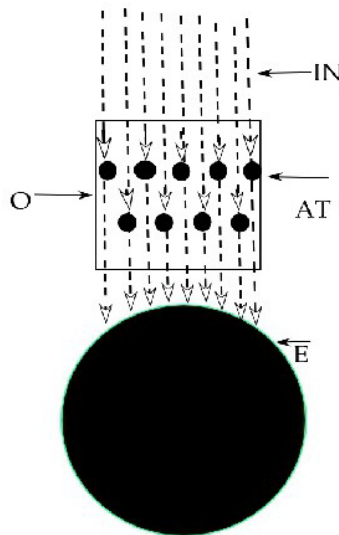


Figure 2.4 The Square = Free–Falling Object Towards Earth (Black Ball)

- The vertical striped lines (IN) symbolize the inflow of space (ether) or in more-accepted terminology, the gravitational field. Note, the inflowing ether possesses both a \rightarrow velocity factor \leftarrow as well as an \rightarrow acceleration factor (IAA) \leftarrow .
 - The large, black solid circle located at the bottom is the Earth.
 - O is the object (hollow square) made of atoms (AT) = small black circles.
 - The hollow arrowheads represent individual atom accelerations located throughout the object as a function of the inflow of the ether (acceleration force factor only) (IAA).
 - Recall the \rightarrow velocity factor \leftarrow of the inflowing ether at the Earth's surface is equal to 11.2 km/sec. And at the same location, the \rightarrow acceleration factor \leftarrow of the inflowing ether is $9.8m/s^2$.
 - So, as a function only of acceleration of the inflowing ether (force) (IAA) but no corresponding opposing force (LSA), the object then is free-falling towards the Earth (weightless geodesic motion/curved space-time).
 - This is also a pictorial representation of a gravitational field (Newton) producing an object's free-flowing motion.
-

2.4 GRT vs. PFGRT

When compared to GRT, the new PFGRT exhibits many of the same outcomes. Even so, there are significant differences. Unlike GRT, PFGRT is much simpler, therefore, more comprehensible, since it is based on three-dimensional space rather than the mathematics of four-dimensional space-time. And for that reason, when compared to GRT, it is fairly easy to visually grasp. Furthermore, math is not involved, since it utilizes common sense logic based upon observations in the real world.

Listed below are the ten outcomes associated with **GRT** as already briefly offered in Section 2.2 but now explained in greater detail. Next, the same outcome, with reference to **PFGRT**, is presented using the new postulates. And finally, both the similarities, as well as the differences, are delineated (**GRT vs. PFGRT**).

Again, the ten outcomes are listed below.

- 2.4.1. Gravitational field
- 2.4.2. Equivalence principle
- 2.4.3. Gravitational lens effect
- 2.4.4. Black hole
- 2.4.5. Inertial mass, rate of time, perception of distance in a gravitational field
- 2.4.6. Decreased in the speed of light in gravitational field
- 2.4.7. Redshifts, blueshifts in a gravitational field
- 2.4.8. The advancement of the perihelion of Mercury's orbit
- 2.4.9. Frame dragging
- 2.4.10. The speed of gravity

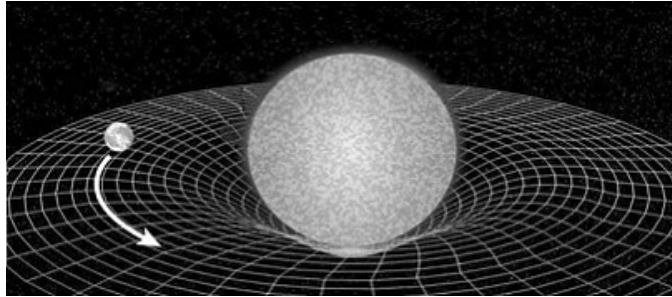
2.4.1. Gravitational Field

GRT

GRT defines a gravitational field as curved four-dimensional space-time (4-D S-T), the underlying reason an object moves towards a large astronomical structure, such as the Sun. The object moves towards the Sun not because there is a force, but rather, because curved space-time changes. Again, there is no force called gravity (gravitational field), only warped space. In other words, the object remains in inertial (geodesic) motion, but its trajectory is altered as a function of the distortion of space shaped by the Sun.

Fundamentally, GRT is a mathematical construct. For that reason, it is very difficult to picture in your mind a three-dimensional image that accurately illustrates the mathematics of

four-dimensional curved space-time, in fact, almost impossible. There are some analogies offered in the literature depicting a hypothetical small object orbiting another theoretical massive large body, the latter of which is located within a well, as pictured below in Figure 2.5. Nevertheless, the concept of time is not easily perceived relative to this two-dimensional figure of four dimensions.



Credit: NASA

Figure 2.5 Bending Space-Time [Fair Use]

- *In general relativity, the warping of the geometry of space-time due to mass distributions accounts for the effects of "gravitational attraction." This principle allows one to replace the effects of gravity by equivalent effects based on the geometry of space-time.*
- *Once gravity is "abolished" in this way, and there is no "force of gravity," then all (gravitating) objects will have motions described by Newton's first law of motion. That is, those in motion will continue in a straight line at constant velocity. However, "straight line" now means only locally straight (locally parallel to a coordinate axis in space). The geometry of space is now "warped" (no longer Euclidean) in such a way that the object's actual trajectory is "similar" to that calculated in the classical way.*
- *Einstein wrote a field equation, which allowed the warping of the geometry of space-time to be calculated given a certain mass distribution. The trajectory of the moon around the Earth is locally straight in a space-time region warped by the presence of the Earth's mass. Such straight lines are called geodesics, defined as the shortest distance between two points in a curved space.*
- *Just as a bowling ball placed on a trampoline stretches the fabric and causes it to dimple or sag, so planets and stars warp space-time—a phenomenon known as the "geodetic effect." Thus, the planets orbiting the Sun are not being pulled by the Sun; they are following the curved space-time deformation caused by the Sun. (From online Cosmotography CCD Images of the Heavens)*

In addition, for the beginner, the following YouTube videos would be helpful.

<https://www.youtube.com/watch?v=fEZupmpTcOU>

Einstein's General Theory of Relativity

URL: <https://www.youtube.com/watch?v=eGWIoSICtEU>

PFGRT

Alternatively, PFGRT presumes an object "falls" inwards towards the Sun because of the Sun's own inflow of space (ether), which then carries the object along with its own motion (acceleration factor only, IAA).

PFGRT vs. GRT

GRT underlying assumptions as to what constitutes a gravitational field differs considerably from PFGRT; nevertheless, the outcome is basically the same. GRT is mainly mathematical. In

contrast, PFGRT's inflow of space concept is visual, furthermore, strictly three-dimensional. And for that reason, when compared to GRT, it is relatively easy to comprehend.

2.4.2 Equivalence Principle GRT

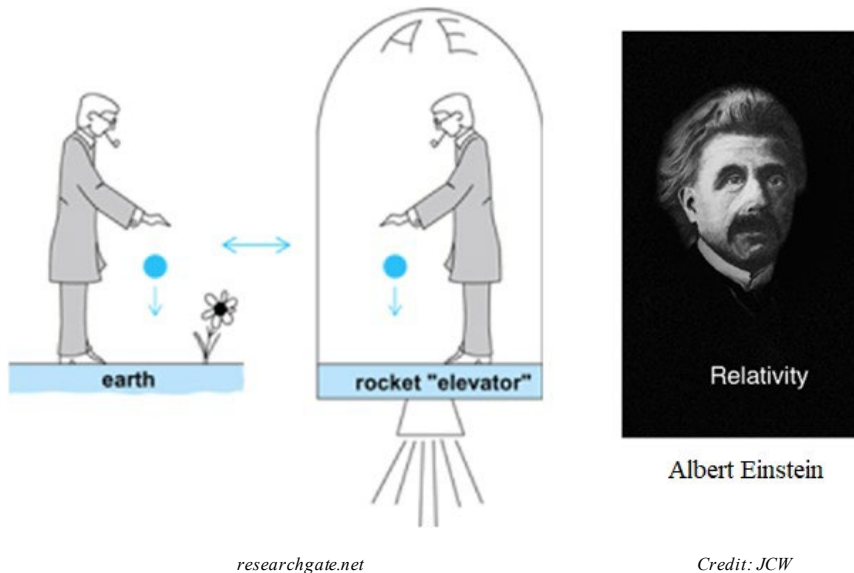
GRT posits that inertia and gravity are equivalent; although the theory gives no underlying visual reasoning for why, it is only a mathematical relationship. Again, its postulates are listed below as found in *The Physics Hypertextbook*.

a. *The absence of a gravitational field (true weightlessness) is indistinguishable from free-fall acceleration in a gravitational field (apparent weightlessness).*

b. *Accelerated motion in the absence of a gravitational field is indistinguishable from unaccelerated motion in the presence of a gravitational field. The local effects of gravity are the same as those of being in an accelerating reference frame.*

<http://physics.info/general-relativity>.

(Figures 2.6 and 2.7 demonstrate this concept, Equivalence Principle.)

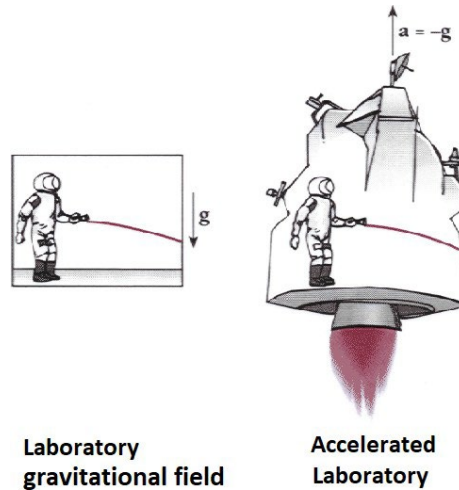


researchgate.net

Credit: JCW

Figure 2.6 Equivalence Principle [Fair Use]

According to General Relativity, objects in a gravitational field behave similarly to objects within an accelerated enclosure. For example, an observer will see a ball fall to Earth provided that the acceleration of the rocket provides the same relative force. [Wikipedia]



http://psi.phys.wits.ac.za/teaching/Connell/phys284/2005/lecture-01/lecture_01/model7.html#warp

Figure 2.7 Equivalence of Bending Light (astronaut with flashlight) [Fair Use]

Special relativity is generalized to accommodate non-inertial reference frames. This is done via the principle of relativity. It is not possible to distinguish (in a closed system) between the effects produced by a gravitational field and those produced by an acceleration of the closed system. Note the curvature of the light beam with respect to both scenarios. (The Particle Solids Interactions Group, University of Witwatersrand)

The following YouTube site refers to the equivalence principle.

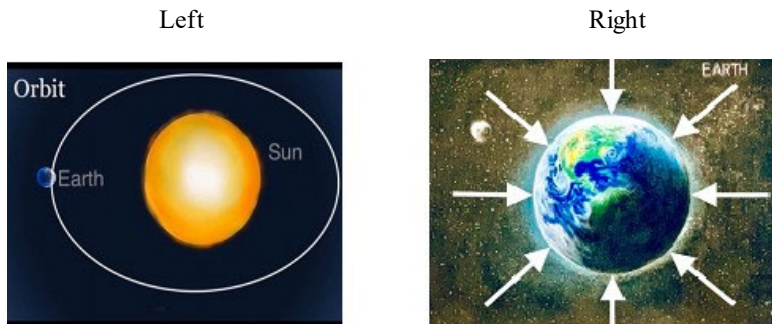
<https://www.youtube.com/watch?v=2MquzTW5nq0>

PFGRT

With reference to PFGRT as compared to GRT, the explanation for the equivalence principle differs considerably as the former is a visual description rather than mathematical. For example, please review Figure 2.8 with its hypothetical model containing the Sun, Earth, and ether. So now instead, imagine there exists only the box (ether of the universe) and the Earth. In essence, we eliminate the Sun, leaving only the Earth and the inflowing ether.

As posited by this new theory, the ether flows into the Earth as water into a sink without rotation, and then disappears. In addition, as it flows inward, it accelerates, stretches, and compresses. The velocity of the inflow at Earth's surface is the sum of all of the accelerations of the inflow, from infinity to the Earth's surface.

For that reason, the →velocity factor← of the inflow located at the Earth's surface is **11.2 km/sec**, and its → acceleration factor← is **9.8 m/sec²**. Basically, this visual imagery is the equivalent to the definition of the Earth's gravitational field.



Credit:JCW

Figure 2.8 Sun (Left) and Earth (Right) Inside The Ether

Left: Square represents the ether of the universe containing only the Sun (S) and the Earth (E) orbiting it. Right: Inflow of space/ether into the Earth.

Therefore, given the assumptions and conclusions of PFSRT as presented in Chapter 1, combining them with postulates 1 through 3, Section 2.3 of this chapter, then the three-dimensional visual description for the equivalence principle is as follows.

Explanation 1

If an object, sighted far from the Earth where there is no flow of space (ether) is then accelerated by a primary/initial force (LSA) at 9.8 m/sec^2 , it becomes compacted from the responding/opposing force of resistance produced by the ether exerted on the object's individual atoms (IAR) as explained in Postulate 3, Scenario A of this chapter. This bidirectional compressive interaction by two forces is the definition of inertia and inertial mass.

Explanation 2

Presuppose the same object is dropped from the very top of a steel tower, located 1,000 meters above the Earth's surface. Moreover, presume there is no atmosphere. And so, as a function of only the Earth's acceleration factor of the inflowing ether, each and every individual atom within the object is then being separately accelerated at 9.8 m/sec^2 (IAA).

However, in contrast to Explanation 1, there is now no compaction, because in this setting, there is no responding resisting/blocking force (LSA). In essence, the object is in geodesic motion or what is called "free falling motion in a gravitational field" as described in Postulate 3 Scenario B of this chapter.

Explanation 3

Presume again the same object is sited on the Earth's surface. Recall that the acceleration of the inflow at the Earth's surface is 9.8 m/sec^2 . In addition, the accelerating factor of the inflowing ether (force) acts separately upon each and every individual atom within the object, analogous to Explanation 2 (IAA). However, in this setting, given that the object lies on the Earth's surface, the Earth then blocks its geodesic path with an opposing force (LSA).

As a result, for that object, compared to the direction of the inflow, there is then a **relative** acceleration oriented in the opposite direction away from Earth, moreover, against this inflowing ether frame. Consequently, the object is compacted from two forces just like Explanation 1 for inertia. However, now in this situation, this is the definition of gravity.

It is rather difficult to perceive that there is, in fact, acceleration from Earth. Therefore, picture this. Imagine that you are sitting on the Earth's surface, and adjacent to you, there is a

very large hole, within which you observe a functioning rocket, oriented in the direction away from Earth.

Envision that this rocket possesses an \rightarrow internal thrust acceleration of $9.8 \text{ m/sec}^2 \leftarrow$. Observe, even in the face of the rocket's internal acceleration, it remains stationary with respect to you on the Earth's surface. This is because the acceleration factor of the inflow at the Earth's surface is also 9.8 m/sec^2 . However, when compared to the rocket's acceleration, it is oriented in the opposite direction. So if you think about it, relative to the inflowing ether frame, both you and the rocket are being equally accelerated away from Earth, one obvious, while the other not apparent. An analogous example is presented below in Figure 2.9.

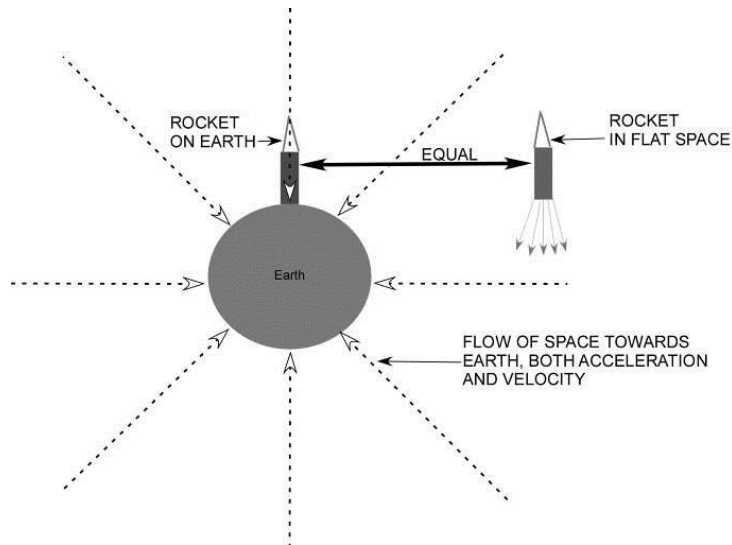


Figure 2.9 Equivalence Principle

- Both of the above rockets have an acceleration of 9.8 m/sec^2 .
- One is sitting quietly on the surface of the Earth with a **relative** acceleration, with respect to the inflowing ether, of 9.8 m/sec^2 , therefore producing a responding resistance force from that ether frame.
 - The other is located in flat space (outside of the influence of a gravitational field) with a **primary acceleration** force of 9.8 m/sec^2 (LSA), but this time, with respect to stationary ether, producing a responding force of resistance from that ether frame.
 - They are equally compacted from two forces (acceleration and resistance), therefore equivalent.
 - Now, even if the rocket sited on the surface of the Earth were functioning with an \rightarrow internal thrust acceleration of $9.8 \text{ m/sec}^2 \leftarrow$, it would still remain stationary with respect to the Earth's surface.
 - Again, this is the equivalence principle.

Explanation 1 assumes the object is accelerated (LSA) at 9.8 m/sec^2 relative to stationary ether, then defined as inertia. Observe the primary/initial force of acceleration (LSA) is in one direction, and the responding resistance force produced by the ether (IAR) is in the opposite direction = compaction. *This is inertia.*

Explanation 3 presumes the same object is also accelerated (LSA, blocking Earth) at 9.8 m/sec^2 , but in this case, **relative to the inflowing ether**, again with resistance (IAR) from that

same frame. Even so, it remains stationary on the Earth's surface. This function is then defined as gravity = a gain, compaction. *This is gravity. And so, gravity and inertia are equivalent.*

The author has found that the following subject matter is extremely difficult to describe, so one needs to really reflect in order to appreciate it. Given the fact that it is so complex, with reference to the following discussion, there is considerable redundancy. Hopefully, the many viewpoints presented will help the reader eventually appreciate this highly abstract topic. However, before proceeding, please take note of the symbols LSA, IAA, IAR, as well as the terms velocity factor/accelerating factor of the inflowing ether as defined earlier in this chapter (pages 36 through 46). One must understand the meaning of those symbols and terms before one can comprehend the following concepts. Now, assuming PFGRT can explain the strong equivalence principle as just presented above, then in order to be valid, it must also give explanation to the weak equivalence principle, as imparted below.

The weak equivalence principal:

"Gravity accelerates all objects equally regardless of their masses or the materials from which they are made. It's a cornerstone of modern physics" (NASA).

So here is the explanation, vis-à-vis the scenario, whereby there is a free-falling object (gravity), which subsequently impacts/strikes the Earth.

- Recollect that earlier in this chapter (pages 36 through 46), the inflowing ether frame has a →velocity factor← as well as an →acceleration factor←. The following explanation refers to only the acceleration factor, which has two basic functions/aspects as defined below. Additionally, at least for now, in order to avoid confusion and to simplify the explanations, the velocity factor will be ignored and dealt with at another time and place (see Appendix N).

- The accelerating factor of the inflowing ether frame (IAA, aka free-fall ether frame) acting alone, thereby producing a free-falling object, possesses two separate aspects/functions that are distinct but still interconnect with one another, the "**falling-force aspect**" (IAA*) (dependent on atomic weight) and the "**acceleration aspect**" (independent of atomic weight) (IAA**).

- For further clarity regarding a free-falling object, since the acceleration aspect of inflowing ether (space) (IAA**) acts equally and separately on all of the individual atoms, including atoms of different atomic weights within the object, moreover, →without a counteracting opposing force/resistance←, then objects of different atomic weights "free fall" at the same rate—the weak equivalence principle. So, for that object, no compaction transpires; the object is in geodesic/weightless/free-falling motion. Observe, with respect to this scenario, atomic weight has no effect on the rate of fall. See site <http://aether.lbl.gov/www/science/equiv.html>.

- For purpose of future reference, the letter A will characterize this concept.

- In contrast, the falling-force aspect (IAA*) exerted on those same atoms (falling objects) is a function of their atomic weights. Consequently, this force will vary, even though the accelerations are all the same.

- **Assume the resistance from the ether, which is a function of the acceleration of objects, relative to itself (ether) by an outside force (e.g., rocket/blocking Earth, LSA) as what produces inertial mass.** So, if there is no relative acceleration, there is no resistance = no compaction/inertial mass. And if there is no inertial mass, then the falling-force aspect (IAA*) will accelerate all objects (atoms) equally (→**because there is no resistance**←) independent of their different atomic weights; essentially, it transforms into the acceleration aspect (IAA**). This is now the falling-force aspect (IAA*) and the acceleration aspect (IAA**) interconnect (IAA = IAA+ IAA**). →They are actually two aspects of the same thing←. For this reason, again atoms of different atomic weights free fall at the same rate, but their falling forces will differ.

- In summary, given the assumptions just presented, picture a free-falling object in geodesic motion towards the Earth. The object's motion is a product of both the acceleration aspect (IAA**) and the falling-force aspect (IAA*), which are distinct, yet they still interconnect with each other ($IAA = IAA^* + IAA^{**}$). As a result, objects of different atomic weight free fall at the same rate, but their falling forces differ dependent upon atomic weight.

- It is only when a free-falling object strikes/impacts the Earth (blocking Earth = $F = ma$, LSA), therefore instantaneously accelerated (relative) against its own free-fall inflowing ether frame, that the opposing resistance from that same ether frame appears (IAA + IAR). So, at that time, the object becomes compacted, which is the definition of inertia and inertial mass.

- What is more, regarding this specific →free-falling object then impact on Earth scenario←, the relative acceleration (force) of the object against the frame of inflowing ether (LSA), inducing an opposing resistance from that frame (IAR, $IAA^* + IAA^{**} = \text{inertia}$), is in part, a function of atomic weight. In essence, the amount of resistance/compaction derived from **only** the inflowing ether frame (IAA) in response to acceleration of an object ($F = ma$, LSA) is the determinant factor for inertia/momentum.

- Again, for future reference, let's now label this second compaction perception by the letter B.

- Now, we'll weave all of this together in one imaginary perception: When an object (matter) free falls to Earth from the acceleration aspect of the inflowing ether (IAA**) without compaction (as there is no resistance), then conception A applies (IAA**). In contrast, when it strikes the Earth, instantly there exists a relative acceleration (force, LSA) of that object against the frame of the inflowing ether, what is more, with resistance generated by that same frame (IAR, $IAA^* + IAA^{**}$). And so, there is compaction (inertia) on impact. Now, concept B is apropos.

- Take notice that A (= no inertial mass) is unrelated to an atom's atomic weight, whereas B (= inertia) is contingent on atomic weight. Consequently, the more the overall atomic weight a free-falling object has and the more its velocity as it crashes into the Earth, then in response, the greater the resistance from that inflowing ether frame ($IAR, IAA^* + IAA^{**}$) = increased compaction on impact (momentum).

- Essentially, when A (geodesic motion/curved space time/free fall) converts upon impact to B, then instantly, there exists a relative acceleration against the inflowing ether frame (LSA force); therefore, the responding resistance force emerges, derived from that same ether frame ($IAR, IAA^* + IAA^{**}$) = object becomes compacted as it strikes the face of the Earth.

- Regarding this specific scenario, what all this indicates is that the inertial mass of an object is only manifested when there is compression/compaction from two opposing forces; one of the forces transfers atom to atom from one side to its other side (LSA), while the other opposing force acts individually and separately on each atom within the object ($IAR, IAA^* + IAA^{**}$). Alternately, when acceleration/force is separately applied to each and every atom within an object (IAA**), without a corresponding opposite resistance/force, inertial mass is not apparent (e.g., free-falling object).

- →So, as above, the measure of resistance exerted on different objects (diverse atomic weights) being accelerated by an outside force (e.g., rocket/blocking Earth—LSA) from **only** the ether (IAR) is what produces differential inertial masses←.

- Viewed from another perspective, but with more detail, fundamentally, the compaction specifically of a →fallen object← or its inertia/momentum is a product of both the initial force (LSA), since the Earth blocks its geodesic path/motion and the opposing resistance/force from the inflowing ether frame ($IAR, IAA^* + IAA^{**}$) oriented in the opposite direction. Or, in other words, the relative acceleration of the object, against the frame of the inflowing ether,

thereby producing resistance from that frame = compaction (inertia). In contrast, if there is no compaction (geodesic motion/free-falling object), there is no inertial mass.

• → **Essentially, objects free fall at the same rate, because they possess no inertial mass (no compaction), but when they reach/strike the Earth's surface, inertia/inertial mass instantly becomes apparent (compaction)** ←.

• The following description is only to some extent analogous to this hypothesis; nevertheless, it does simplify the general idea. Presuppose that you are swimming in a river, and subsequently, you flow along with the river over a waterfall. During this downward motion with the water, you are not compacted, in fact, you are weightless. In addition, everything in your frame free falls at the same rate, independent of inertial mass (atomic weight). →This is A←. In this weightless state, you manifest no inertial mass. Next assume there is a large lattice that blocks your falling motion, it, nevertheless, still allows the water to pass through, so as you strike it, your motion changes; as such, you now possess relative acceleration (compaction, LSA) against the frame of the falling water (the falling water is →somewhat← analogous to the inflowing ether frame). Regarding this falling water compaction correspondence/scenario/analogy, you now possess inertial mass. →This is B dependent on atomic weight←.

In summary:

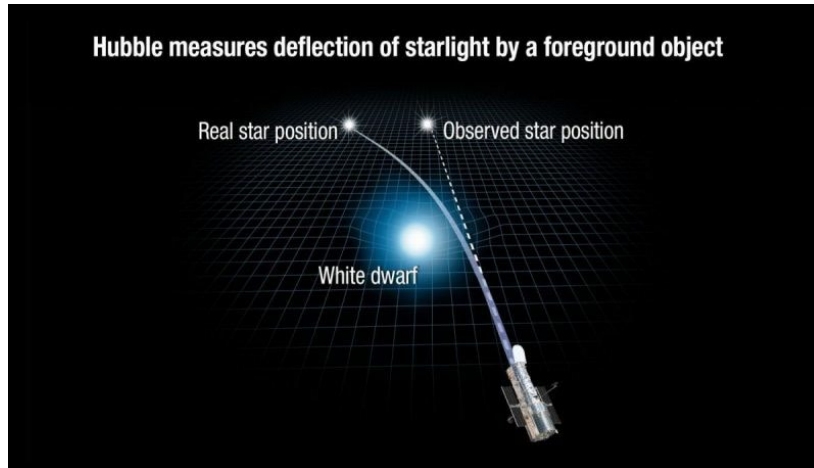
1. Inertia mass (inertia) is always associated with compaction, as is gravity.
2. In addition, the ether's acceleration aspect (AA**) acts equally on atoms of different atomic weights, even though the falling-force aspect (IAA*) varies as a function of atomic weight. As a result, diverse objects of different atomic weights free fall at the same rate; nonetheless, their falling forces will differentiate again dependent upon atomic weight.
3. Furthermore, it is the resistance explicitly from **only** the ether (IAR) to the acceleration of matter by an outside force = (LSA relative to itself [ether]) that gives rise to inertial mass—different atomic weights elicit different amounts of resistance as a function of **only** the ether.
4. So, if there is no inertial mass (resistance from the ether), then the falling force aspect (IAA*) will accelerate all objects (atoms) equally, independent of their different atomic weights; essentially, it transforms into the acceleration aspect (IAA**). This is how the falling force aspect (IAA*) and the acceleration aspect (IAA**) interconnect (IAA = IAA+ IAA**). →They are actually two aspects of the same thing←.
5. Again, for this reason (4), atoms of different atomic weights free fall at the same rate, but their falling forces will differ.

For a complete and much more extensive explanation, see Chapter 5, Section 5.6.11 (pages 273 to 278, Inertial Mass) as well as Appendix N.

2.4.3 Gravitational Lens Effect

Einstein's theory predicts that the direction of light propagation should be changed in a gravitational field. We have already seen a spectacular consequence of the deflection of light in a gravitational field: gravitational lensing. [Source: <http://csep10.phys.utk.edu/>]

Figures 2.10, 2.11, and 2.12 below portray this phenomenon.



Credit: NASA

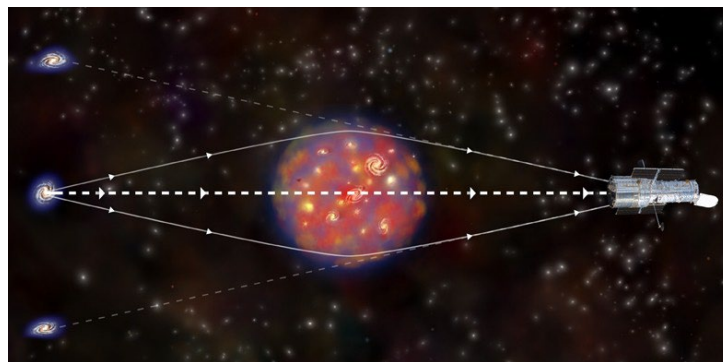
Figure 2.10 Space–Time Bends Light [Fair Use]

Figures 2.10 and 2.11 show the bending of light by a gravitational field (GRT) or in the lexicology used in this book, the inflow of space (PFGRT–ether).

The following YouTube presentations explain the gravitational lens effect:

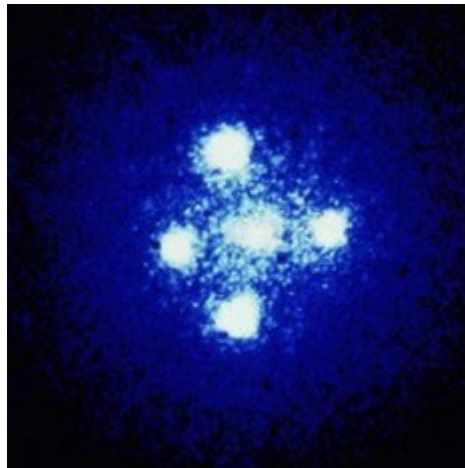
<https://www.youtube.com/watch?v=H1bZcdE9zP0>

<https://www.youtube.com/watch?v=eGWIoSICtEU>



Credit: NASA

Figure 2.11 Bending of Light [Fair Use]



Wikipedia

Figure 2.12 Gravitational Lens (Einstein's Cross) [Fair Use]

The photograph is of four separate images of the same central distant galaxy! It appears as multiple images because the light is bent into four separate paths by the intervening lens (mass). (Science Blogs.)

GRT

GRT posits that light traveling tangential to the Sun's surface bends towards the Sun. The underlying cause for why is given by a mathematical equation that represents changes in the "rate of time" and distance. This is known by the phrase "four-dimensional space-time." It assumes there is no force called gravity, rather it is "space-time" that changes (warped space). And for that reason, light then shifts towards the Sun.

PFGRT

PFGRT also posits that light traveling tangential to the Sun's surface is deflected towards it. However, in this case, it is a function of the Sun's inflow, because this is what carries the light along with its own motion. This is similar to the way a river transports its waves along with its own movement. In addition, PFGRT posits that both the velocity factor and the acceleration factor of the inflowing ether transport electromagnetic radiation (light). In contrast, matter (object) is only affected by the acceleration factor of the inflowing ether. So what significance does this dichotomy then indicate? **Light is a part of the ether, whereas matter is separate from the ether.**

For that reason, this assumption means that even though light (c) travels faster when moving tangentially to a large astronomical object (e.g., Sun) compared to matter ($< c$), then, as a function of the inflowing space/ether, connected to that structure (velocity factor and acceleration factor), the light is deflected \rightarrow per unit of time \leftarrow more towards that object (electromagnetic effect = both velocity and acceleration) compared to matter (ballistic effect = only acceleration).

PFGRT vs. GRT

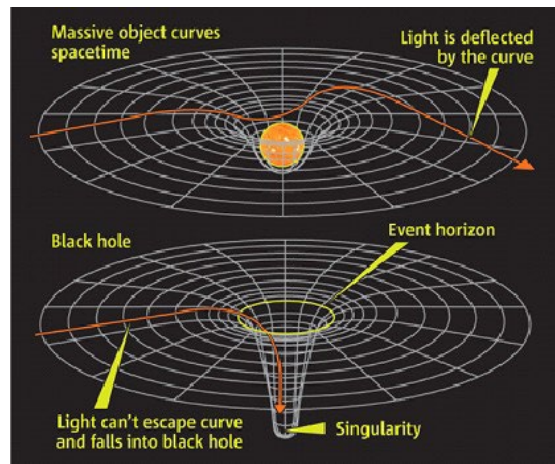
GRT utilizes four-dimensional space-time defined by Einstein as curved space-time to explain the Gravitational Lens Effect. This concept is extremely difficult to visualize, as it is almost purely mathematical.

Alternatively, PFGRT is a three-dimensional concept, therefore, fairly easy to imagine. In other words, both GRT and PFGRT predict, as well as produce, basically the same outcome. One is mathematical, while the other is visual. The most important factor to recognize is that PFGRT is considerably easier to comprehend (Occam's razor).

2.4.4 Black Hole

GRT

GRT posits that a black hole is a product of four-dimensional space-time, which is so powerful that it then curves back around upon itself. Consequently, light cannot escape from its influence. Please review Figure 2.13, which attempts to show the concept of four-dimensional space-time including a black hole. The lower schematic portrayed below is representative of a black hole. Observe it is difficult to illustrate four-dimensional space-time with respect to two-dimensions, especially the concept of space-time.



Young Scientists Journal Online
 Courtesy of Caleb Scharf
www.nyas.org/publications/

Figure 2.13 Large Object vs. Black Hole Bending Space Time [Fair Use]

The effect of a mass on space and time is best illustrated by the analogy of an object placed on a rubber sheet. The object deforms the sheet just as a mass distorts space and time around itself (top).

A super-massive object, such as a black hole (a highly dense and compact mass), stretches the sheet so far that it becomes a funnel from within from which nothing can escape (bottom). [Source: www.nyas.org/publications/]

Alternatively, **PFGRT** posits that a black hole represents the inflow of space towards an enormous astronomical object at velocity of greater than (c) . Therefore, light traveling at (c) , moreover, in opposition, then cannot escape. See figures 2.14 and 2.15 below. Observe, this concept is easily comprehensible, moreover, clearly visualized. Note: This concept uses only the measuring stick distance.

GRT VS. PFGRT

Both GRT and PFGRT essentially produce the same outcome as pictured below in Figure 2.15. However, one is mathematical(GRT), while the other visual (PFGRT). Nonetheless, PFGRT is much easier to understand (Occam's razor).

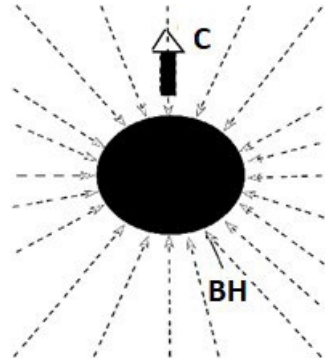
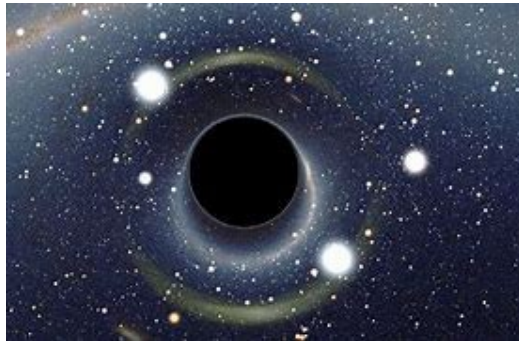


Figure 2.14 Light Trying to Escape

- *BH = black hole.*
- *The dotted lines portray the inflow of space $> (c)$.*
- *The vertical single, thick black arrow depicts light traveling away from the BH at (c) .*
- *As a result, light cannot escape.*



Wikimedia Commons

Figure 2.15 Light Cannot Escape [Fair Use]

Light cannot escape from a black hole. For that reason, there is a central void as pictured above. Both GRT and PFGRT produce the same result.

2.4.5 Inertial Mass, Rate of Time, Perception of Distance in a Gravitational Field

GRT

GRT postulates, from the frame of an observer located far from the Sun, that when an object moves closer to the Sun, its inertial mass increases, its "rate of time" slows down, and, for that object, distance/length in the direction of motion shrinks. Principally, GRT is a mathematical equation representing these conclusions. Nevertheless, other than math, the visual rationale for why this transpires is not apparent.

PFGRT

In contrast, PFGRT posits that as the ether inflows towards the Sun, it accelerates, stretches, and compresses. Remember, the velocity of the inflowing ether located at the Sun's surface is the sum of all of its accelerations, from infinity to the Sun's surface. Recollect as well, as presented in Chapter 1, that an object's resistance to acceleration by force derived from **only** the ether is what gives rise to inertial mass (LTF), the rate of time (LTF), and the perception of motion distance through space (ether).

Therefore, given all of the above, and with reference to the Sun, what happens to a small orbiting object, when its orbital radius suddenly contracts? Listed below: A, B, and C are those results.

A. When the orbital radius of the object decreases, relative to the Sun, its interaction with the velocity of the inflowing ether then increases. This is because, at that new location, there is an increased velocity/acceleration of the inflowing ether. For that reason, moreover, for that object, as a LTF, there is then an increased resistance to its acceleration by force—increased inertial mass.

B. In addition, while in orbit, the object also possesses a transverse velocity relative to the Sun's inflow. So as a function of being closer to the Sun, its orbital velocity relative to the inflowing ether then increases. In turn, as an LTF, this effect produces increased resistance again to its acceleration by force—increased inertial mass.

C. Furthermore, presupposing that the inflowing ether self-compresses (becomes denser) when it travels inwards towards the Sun, then as the orbital radius of the object diminishes, this third factor again produces a further increased resistance to acceleration by force. The denser the ether, the more the resistance from the ether, once again causing increased inertial mass.

In conclusion, linking them together, when an object's orbital radius contracts, its overall relative velocity with respect to the ether increases (A and B). In addition, at that new location, the density of the ether also increases (C). Therefore, for that object, all three functions then produce an increased resistance to acceleration by force once again increased inertial mass.

As such, overall, the object's inertial mass increases, its rate of time slows, and an observer located with that object →perceives← a decrease in motion distance to other objects. Furthermore, following the orbital contraction, the vibrating atoms within the object then slow down (rate of time). So, assuming light is emitted from that object, it is then redshifted.

As an aside, given the attributes of the inflowing space theory, an object's "time dilatation" (rate of time) when located inside a gravitational field (PFGRT) is a different process compared to an object's time dilatation as a function of its velocity relative to the ether of PRSRT. Essentially, time dilatation in a gravitational field (inflow of space) is related to three factors—compression (density), velocity, and possibly acceleration, whereas time dilatation relevant to flat space (PFSRT) is a function of only velocity (or relative velocity). Pertaining to PFGRT, acceleration is described as possible, because its only function may be that it gives rise to velocity. The following website refers to this hypothesis:

<https://www.researchgate.net/post/>

(Does acceleration affect the rate of a clock?)

GRT vs. PFGRT

Both GRT and PFGRT produce similar outcomes. However, PFGRT is much easier to visually comprehend, since it is not mathematical.

2.4.6 Decrease in the Speed of Light in Gravitational Field

GRT

Light slows down traveling in the direction away from a massive astronomical object such as the Sun. Why? GRT assumes that light slows down traveling from the Sun as a function of a decreased rate of time, as well as changes in distance (four-dimensional space-time).

Keep in mind, this perception is only from the frame of an observer position far from the Sun: a different reference frame. But if the observer is located in the same frame as the light, then its speed remains at (c) . This theory is fundamentally a mathematical concept and very difficult to visualize.

Here is a citation describing this concept.

In GR, the speed of light is locally invariant, that is, if you measure the speed of light at your location, you'll always get the value of (c) . However, if you measure the speed of light at some distant location, you may find it to be less than (c) .

The obvious example of this is a black hole, where the speed of light falls as it approaches the event horizon and, indeed, slows to zero at the event horizon. The reason we may measure the speed of light at a distant location to be less than (c) is because space-time is curved by mass/energy. The coordinates that you use for measuring space-time will not match the coordinates a distant observer uses, and that's why the two of you measure different values for the speed of light. To calculate the speed of light at some distant point, you need to solve Einstein's equations to find out how space-time curves relative to your coordinate system. (From online Stack Exchange, Physics)

PFGRT

PFGRT also presumes that light slows down traveling from the Sun. However, in this case, it is due to the presumption that light travels at (c) , against the inflow of the ether. Therefore, from the perspective of an observer located far from the Sun, it appears to travel towards him/her at a velocity $<c$. Again, this is because the inflow is in one direction, whereas the light beam travels in the opposite direction. It is comparable to the concept of a black hole as just described in the prior section, but in this instance, light is able to escape.

This concept is analogous to a boat traveling upon a river, as observed from a bridge located upstream that crosses that river. If the river is flowing at 10 mph downstream (inflow) while the boat is traveling at 30 mph upstream (c) , then from the perspective of the observer, the boat appears to be traveling towards him/her at 20 mph $(<c)$.

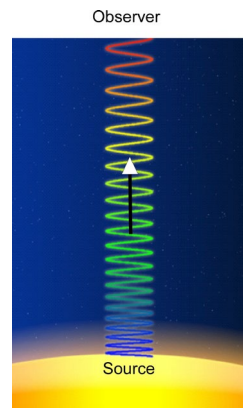
GRT vs. PFGRT

GRT's underlying assumptions as for why light slows down in a gravitational field differs significantly compared to PFGRT. Nonetheless, the outcomes are analogous. Once again, GRT is mathematical, whereas PFGRT is three-dimensional, and what's more, visual. Therefore, PFGRT is much easier to comprehend.

2.4.7 Redshifts, Blueshifts in a Gravitation Field GRT

GRT

Einstein's GRT posits that light traveling away from a strong gravitational field exhibits a shift to a lower frequency (redshift) as shown in Figure 2.16 below. GRT posits that the redshift is the result of the loss of energy of the electromagnetic radiation as it climbs out of a gravitational well. Conversely, it is blueshifted due to a gain in energy while traveling into a gravitational field.



Wikimedia Commons

Figure 2.16 Gravity Inducing Redshift [Fair Use]

Redshift = longer wavelength; blueshift = shorter wavelength. Here is an intuitive explanation of frequency shift induced by gravity. While escaping it, light has to fight the gravitation field or force of gravity. Just as a stone thrown from the ground up into the sky loses speed or energy, light waves emitted from the surface and away from it must lose energy. And light rays happen to lose energy, not through lower speeds, but through lower frequencies or a shift toward the red frequency, which is lower than the blue frequency. <http://gravimotion.info/gravity-frequency.php>

PFGRT

As one peruses the following paragraphs, it will become apparent that this topic is extremely complicated, consequently lengthy. Most likely it will be difficult for the average individual to comprehend.

Nevertheless, the author will attempt to make the explanation as simple as possible. PFGRT also postulates that light emitted from an object located close to the Sun appears redshifted from the perspective of an observer positioned far from the Sun. This is because the number of wavelengths per second observed at that location decreases (redshift) since light travels $<c$ (c minus the inflow of space) as presented in the prior section. In addition, given that the inflow stretches as it accelerates towards the Sun, then light traveling against the inflow also stretches, so again redshifted for the observer far from the Sun. Furthermore, photons emitted from the vibrating atoms of an object located close to the Sun are associated with a slower rate of time relative to the observer far from the Sun, so once again redshifted from the perspective of the observer sited far from the Sun.

In conclusion, regarding this description now defined as Scenario 1, the redshift of light as observed far from the Sun for light emitted from an object located close to the Sun is a function of:

1. The perceived velocity $<c$, (c minus the velocity of the inflow); thus, the number of observed wavelengths per second decreases (redshift).
2. The stretching of the inflowing ether as it accelerates in towards the Sun (redshift).
3. And finally, the **relative** slowing of the rates of time, emitter slower than the observer (redshift). So, regarding Scenario 1, the overall number of wavelengths perceived by the observer per second, then decreases when compared to the emitter.

Conversely, light is perceived as blueshifted relative to an observer located close to the Sun with respect to light emitted from an object positioned far from the Sun, now defined as Scenario 2. This is a function of:

1. The velocity of light is greater than (c) (c plus the velocity of the inflow). Consequently, the number of wavelengths perceived by the observer per second increases (blueshift).

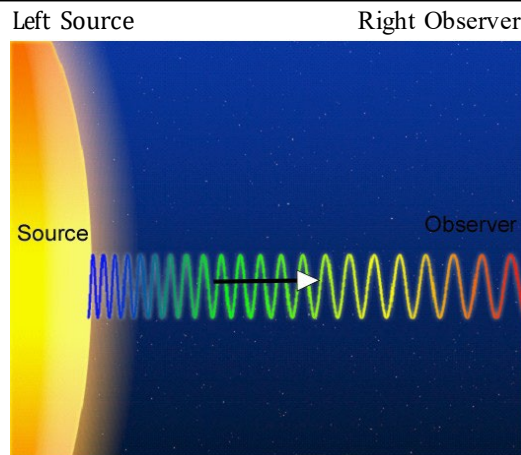
2. There is a relative increase in the rates of time, emitter faster than the observer; therefore, the number of wavelengths per second perceived by the observer increases (blueshift).

3. However, with respect to Scenario 2, as opposed to Scenario 1, take note of this. The inflowing ether stretches as it accelerates towards the Sun. Consequently, with reference to this specific function and only this function, electromagnetic radiation traveling both to and from the Sun is stretched in both directions, **accordingly redshifted in both directions**. This means that with respect to this blue versus redshift model, light emitted from an object close to the Sun as observed far from the Sun (Scenario 1) is not anti-symmetrical with respect to light emitted by an object located far from the Sun as observed from close to the Sun (Scenario 2).

4. Even so, with reference to Scenario 2, the overall number of wavelengths perceived per second by the observer still increases (blueshift).

This model is extremely complex. Therefore, for reinforcement, it will now be reexplained from a different perspective. This concept is considerably easier to understand if analyzed from the perspective of only the observer, comparable to Einstein's SRT/GRT. So, with respect to this specific concept, imagine it from the perspective of only the observer as now summarized below.

Scenario 1 is from the observer's perspective, located far from the Sun (right side), relative to a light beam emitted from an object close to the Sun (left side). This scenario is depicted in Figure 2.17 below, moreover, with a following summary.

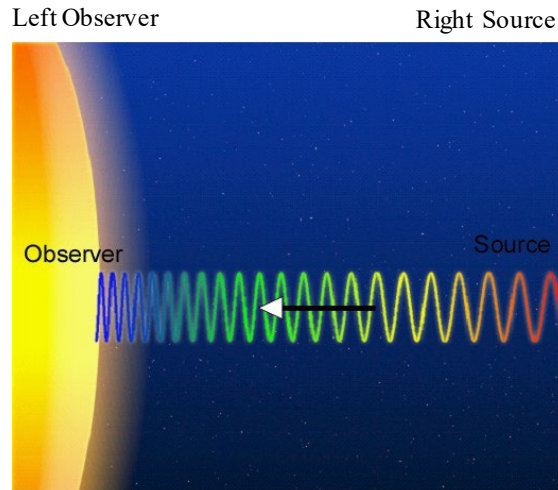


Wikimedia Commons

Figure 2.17 Redshift [Fair Use]

- *Decrease in the speed of light $< c$ (c - the inflow) = redshift.*
- *Relative slower "rate of time" of the emitter (left) compared to the observer (right) = redshift.*
- *The stretching of accelerating inflowing ether (space) = redshift.*
- *Overall, there is a redshift.*

Scenario 2 is from the observer's perspective located close to the Sun (left side), relative to a light beam emitted from an object (right side) positioned far from the Sun. This concept is shown in Figure 2.18 below—again with a following summary.



Wikimedia Commons

Figure 2.18 Blueshift [Fair Use]

- Increase in the speed of light $> c$ ($c + \text{the inflow}$) = blueshift.
- Relative faster "rate of time" of the emitter (right) compared to the observer (left) = blueshift.
- The stretching of the inflowing ether = redshift.
- Overall, there is still a blueshift.

Essentially, the specific function of the stretching of the inflowing ether in both directions, to and from the Sun, produces a redshift of light in both directions, which is actually a loss of energy. So overall, considering all the functions, the energy loss of the outgoing light wave from the Sun is greater compared to the energy gain of the incoming light wave directed towards the Sun.

Scenarios 1 and 2 are not anti-symmetrical, in view of the fact that the stretching of the inflowing ether produces a redshift of light in both directions, whether traveling to or from the Sun.

GRT vs. PFGRT

GRT posits that light travels from the Sun at $< c$, as observed far from the Sun because "time" slows down and distance decreases the closer to the Sun (four-dimensional space-time).

But most importantly, this perception occurs only as observed outside that increasing gravitational frame. In addition, it presumes light loses energy as it travels against the gradient of a gravitational field. Recall, the longer the wavelength, the less energy. Of course, then, light traveling inwards towards the Sun is the converse.

In contrast, PFGRT pictures the underlying physical mechanism whereby they are connected, not with math, rather visually with respect to three-dimensional space (ether). Both GRT and PFGRT produce somewhat similar outcomes. Both theories are complex, one mathematically (GRT), the other visually (PFGRT). Perhaps with time, they can be tested with new observations along with experiments. Then, eventually, either one could be corroborated with

a rigorous mathematical proof. Yes, in the final analysis, math is absolutely necessary for confirmation of any given theory. Nevertheless, it should not be the primary driving force for the theory.

Bear in mind, as a speculation and only a conjecture, presupposing all of that presented above is germane (PFGRT), then reflect on this. There are unsolved mysteries rewarding present-day cosmology. First, this includes the anomalous increased peripheral rotational rate of galaxies, the unexplained increased gravitation lens effect, and the formation of the large-scale cosmic web-like structure of the universe. Physicists hypothesize dark matter as an explanation. And second, \rightarrow over time \leftarrow , there is the observation of an inexplicable increasing rate of expansion of the universe. In this instance, as a cause, physicists theorize dark energy. Then again, there is another option: The inflowing space/ether theory (PFGRT) with its associated redshifts is an alternative premise relevant to those aberrant observations (compared to the expectations of Newtonian mechanics).

For instance, PFGRT may not exactly correspond to Newton's gravitational theory applicable to the large-scale matter structures of the universe. This is due to the proposition regarding PFGRT, that there is an overall loss of space/ether located about matter (galaxies/super-clusters of galaxies, etc.), given the idea that space/ether flows into matter and then vanishes. As such, PFGRT could give rise to a different hypothesis vis-à-vis the observed incongruities as depicted above, instead of being attributed to dark matter.

And as for dark energy, \rightarrow over eons \leftarrow , as matter coalesces/contracts into the large-scale cosmic web-like pattern of the universe (progressively larger and denser clumps/webs of matter), then as observed from Earth, there would be a **relative** increased redshift of light generated from galaxies, located within a web close to Earth, as compared to other galaxies sited in different webs positioned far from Earth. Furthermore, this form of gravitational redshift (inflow of space) would be superimposed upon the redshift of expanding space—Hubble constant (distance from the observer on Earth).

This is because, for the former (not the Hubble constant), the ether stretches as it flows into matter (thus a redshift of light emitted from a large astronomical object). And second, this phenomenon is also because, with reference to light, there is an intensifying redshift whenever it is generated close to/within increasing vast amounts of matter versus light sourced from lesser amounts of matter. Light emitted from enlarging/merging galaxies, which are located within the ever-concentrating cosmic webs, will exhibit over eons an ever-increasing redshift as a function of an ever-strengthening gravitational field.

Viewed from another perspective, \rightarrow over time \leftarrow , as the cosmic web-like pattern of the universe continually forms/contracts, the greater then is the overall density of matter within in that coalescing structure (strengthening gravitational influence). In turn, light emitted from galaxies (matter) sited within that changing configuration will show, \rightarrow again over time \leftarrow , an increasing redshift, more pointedly, not a function of distance from the observer on Earth (ballooning space—Hubble constant).

And so, from our reference frame on Earth, the observed redshift of light from galaxies is a function of the following:

1. The distance from Earth, as an effect expanding space, (the voids of the ballooning ether) located between the webs—e.g., Boötes void). Once again this is the Hubble constant.
2. Over time, the increasing density/coalescence of matter into the formation of the cosmic web-like structure of the universe, a product of inflowing space/ether (PFGRT) into matter (e.g., galaxies, etc.) whereby space/ether then disappears. This is similar to, but not exactly like, Newton's gravitational theory.

So in summary, light emitted from galaxies positioned close to Earth, sited within the webs, is associated with a greater →**relative redshift**← (not taking into account the expansion of space) compared to light generated from other galaxies located far from Earth, again within the webs (further back in time). Furthermore, this function is not based upon distance from Earth but rather from the intensifying redshift gravitational effect related to the coalescing/denser webs of matter (e.g., galaxies) that occurs over time. This outcome would then **mimic** dark energy **as observed from Earth**.

In addition, as an assumption of functions 1 and 2, as we (observer on Earth) look out into the universe, →back in time←, the Hubble model is not a straight-line constant (mathematical function) nor for that matter, perhaps not even a constant at all. Also, the inflowing space theory (PFGRT) clarifies why there is no local expansion (our galaxy and the local group of galaxies). This is because close by we exist within one local cosmic web-like structure consisting of inflowing space/ether into matter where it subsequently vanishes (PRGRT). One more time, this premise is somewhat but not exactly like Newton's gravitational theory, which holds the local group of galaxies together since it counteracts the expansion. What is more, we are not located within the expanding bubbles of empty space/ether.

Finally, the author poses this question. Given all that as just described above, does the minimal variation detected in the cosmic microwave background radiation (1 to 1,000,000, refer to Figure 1.13) epitomize what occurred, →back in time←, at the origin/beginning of the universe, or is it a function of its large-scale, web-like structure but now observed →presently← from our local reference frame on Earth, or possibly even both?

For a video review of the classic modern theory of cosmology, →not the author's theory← (PFGRT), please refer to the websites provided below, vis-à-vis the development over time of the large-scale, web-like structure of the universe.

HubbleSite: Video - Cruising the Cosmic Web, V2 (Dome Version)

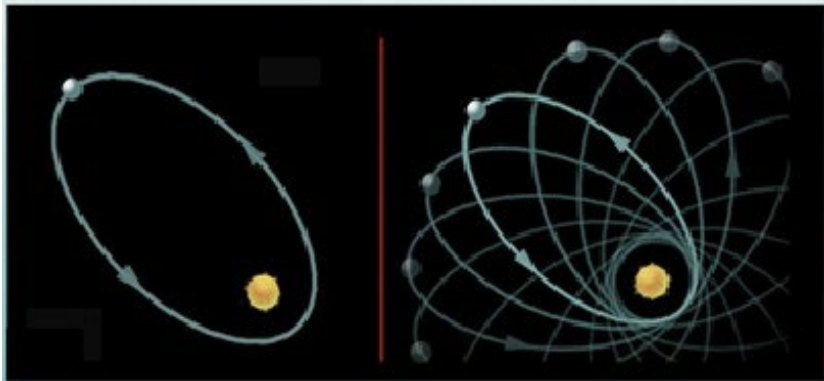
Large-scale Structure of the Universe - Bing video

(119) Formation of Large-Scale Structure in the Universe (Intro Astronomy module 14, lecture 6) - YouTube See especially starting at about 19 minutes 30 seconds

2.4.8 The Advancement of the Perihelion of Mercury's Orbit

Figure 2.19 below portrays the advancement of the perihelion of Mercury orbit. Following the figure, there is a quote explaining this phenomenon.

Mercury's Orbit



Phys. Rev. D, open access

Figure 2.19 Mercury's Perihelion Advance [Fair Use]

This is an artist's version of the precession of Mercury's orbit. Most of the effect is due to the pull from other planets, but there is measurable effect due to the corrections to Newton's theory predicted by the General Theory of Relativity. [http://physics.ucr.edu/~wudka/Physics7/Notes-www/nod_e98.html]

"The orientation of Mercury's orbit is found to precess in space over time, as indicated in the above figure (the magnitude of the effect is greatly exaggerated for purposes of figure). This is commonly called the 'precession of the perihelion,' because it causes the position of the perihelion to move around the center of mass. Only part of this can be accounted for by perturbations in Newton's theory. There is an extra 43 seconds of arc per century in this precession that is predicted by the Theory of General Relativity and observed to occur (recall that a second of arc is 1/3600 of an angular degree). This effect is extremely small, but the measurements are very precise and can detect such small effects very well." (University of Rochester, Department of Physics and Astronomy)

See the YouTube presentation of this subject:

http://physics.ucr.edu/~wudka/Physics7/Notes-www/nod_e98.html

GRT

One major celebrated proof of Einstein's GRT is that it gives explanation to the advancement of the perihelion of Mercury's orbit more precisely compared to Newtonian physics. GRT's explanation for the advancement of the perihelion of Mercury's orbit is mathematical, as it involves changes in rate of time and distance (four-dimensional space-time), thus very difficult to mentally visualize.

PFGRT

PFGRT is compatible with Mercury's true orbital mechanics as well. This concept is also somewhat difficult to mentally visualize. Even so, this concept is to some extent pictured in Figure 2.20 below. Furthermore, it is explained in the following passages.

Mercury's orbit is proportionally more elliptical compared to the Earth's orbit. As a result, during perigee, when it moves closer to the Sun, it then transverse through more condensed space (ether). This is because the inflow of space compresses as it inflows towards the Sun. So, during this interval, it then advances its orbit relative to Earth's orbit. Again, this is because it is traveling through denser space **compared** to that of the Earth.

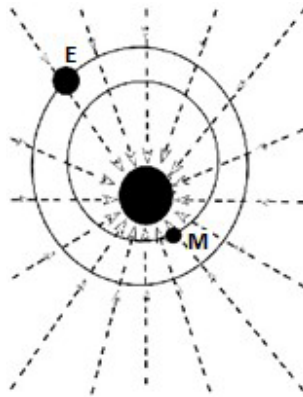


Figure 2.20 Mercury's Orbit vs. Earth's Orbit

- *The dotted arrows represent the inflowing space or the inflowing ether.*
- *M = Mercury with its elliptical orbit.*
- *E = Earth with its more circular orbit.*
- *The central black circle is the Sun.*

Nevertheless, Mercury's orbital advancement cannot be readily observed from Earth until it reaches apogee, whereby the ether is less compressed. As a result, over time, during its many orbits, it will eventually advance its perihelion, relative to the observer located on Earth more accurate than by using Newtonian orbital physics alone, just like GRT.

GRT vs. PFGRT

Both GRT and PFGRT conceivably can produce the same outcome. Both are complex, one mathematically (GRT) and the other visually (PFGRT). Perhaps in the future, they can be tested by observation with a corresponding mathematical proof. Yes, again, we need math.

2.4.9 Frame Dragging

A pendulum placed in motion at one of the Earth's poles appears to rotate 360 degrees every 24 hours. Superficially, it appears that way. However, in reality, it is not the pendulum that is

rotating; rather, it is the observer. This is a function of the pendulum's conservation of momentum with respect to the nonrotating gravitation field. What does this signify? This indicates that the inflowing ether, or expressed in more accepted terminology, the earth's gravitational field, →does not rotate, to any significant degree←, along with the earth's axial spin.

GRT

GRT posits frame dragging. As a result, the Earth along with its axial rotation, then drags a minuscule portion of its nonrotating gravitational field (4-D S-T) into its own revolving motion. Essentially, frame dragging, if genuine, is infinitesimal, but perhaps not quite immeasurable, given that Gravity Probe B, supposedly, as hypothesized, proved its existence. So, assuming Gravity Probe B's results are correct, then frame dragging is real. Figure 2.21 below portrays an exaggerated image of frame dragging.



Figure 2.21 Frame Dragging [Fair Use]

This artists' conception—by copyright holders James Overduin, Pancho Eekels and Bob Kahn—depicts the probe's findings. Online via NASA; fair use for educational purpose.

Figure 2.21 portrays an exaggerated image of frame dragging. A NASA space vehicle, known as "Gravity Probe B," has measured the curved space-time around the Earth. The principal investigator of the probe's mission was Stanford University's Francis Everitt, who said, "The space-time around Earth appears to be distorted just as General Relativity predicts." [Source: NASA]

PFGRT

In contrast, PFGRT does not posit this phenomenon, though it does not completely rule it out since it is so minute. If you think about it, if the nonrotating inflowing ether (gravitational field) flows in to rotating matter, such as the Earth, then it is difficult to believe there is not at least some effect. Even so, this concept is not posited with respect to PFGRT.

GRT vs. PFGRT

PFGRT is not consistent with frame dragging, whereas GRT predicts it. As a tangent, the →nonrotating inflowing ether← (EGF ECF) is also the local preferred inertia on Earth. So again gravity and inertia are equivalent. As such, this gives explanation to Newton's rotating bucket argument/experiment (RBA, RBE), whereby he posited acceleration of the RBE relative to an entity, termed absolute space.

See the two websites below for a full visual demonstration and explanation.

1. <https://en.wikipedia.org/wiki/Bucket-argument>
2. <https://www.youtube.com/watch?v=Toy4T9WMS9U>

After viewing these two websites, here is the author's alternative explanation/postulate for the outcome of Newton's RBE.

A. The \rightarrow nonrotating inflowing ether \leftarrow ECF/EGF resists acceleration of matter(object), including its angular acceleration, therefore, for the later, producing centripetal/centrifugal forces. In contrast, the ECF/EGF/ether does not resist an object's translational velocity nor its angular velocity.

B. In other words from the perspective of Earth's surface, as a function of the Earth's axial spin within the ECF/EGF inflowing ether, there is then a relative ether wind. Basically, the RBE possesses a transverse/translational velocity with respect to the ECF/EGF given the fact it travels along with the rotating Earth's surface.

C. The acceleration effect of the RBE was perceived by Newton to be related to a fixed frame (absolute space). However, his postulate was in erratum. Again, this is because the nonrotating inflowing ether (ECF/EGF) does not resist the RBE's translational velocity as it travels in synchrony along with the rotating Earth's surface, nor does it resist its angular spin velocity. But at the same time, it does resist its angular acceleration, accordingly, generating centrifugal/centripetal forces.

D. Fundamentally, although not readily apparent, the acceleration effect of the RBE is relative to the ECF/EGF/inflowing ether, which like Newton's absolute space idea is a non-rotating fixed frame. Nevertheless, the ECF/EGF is not the absolute space frame as posited by Newton.

E. So given all the above, then vis- \hat{a} '-vis the RBE, its angular velocity/translational velocity relative to the ECF/EGF is not apparent. Only the function of its angular acceleration with respect to the ECF/EGF remains.

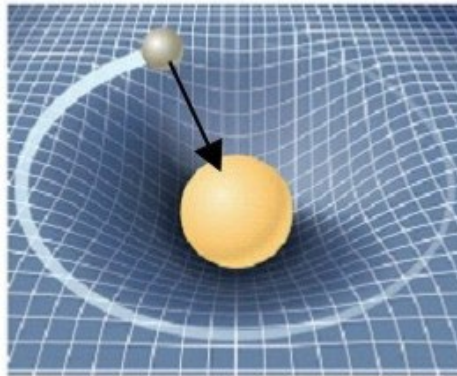
F. That is to say, regarding the outcome of the RBE, moreover, as a consequence of this dichotomy, the remaining perception of acceleration relative to the ECF/EGF, then mimics Newton's idea of absolute space.

G. Discern this new theory is in conflict with the Mach principle, whereby acceleration and inertia are related to the sum total mass of the universe.

2.4.10 The Speed of Gravity GRT

GRT posits that the speed of gravity (gravity waves) is (c) , since absolutely nothing can travel faster. This is a basic assumption. Moreover, it is a part of the mathematics of GRT. GRT hypothesizes that mass curves space-time at velocity (c) moving spherically outward from a large astronomical object such as the Sun, as illustrated below (Figure 2.22). Furthermore, that curved space-time then tells mass (Earth) how to move.

When the Earth orbits, curved space-time generated from the Sun is already in place. Therefore, the interaction of the Earth with curved-space (warped space) is always oriented at a right angle directly towards the Sun. For that reason, even though gravity waves travel at (c) , as a sphere traveling outward from the Sun, the gravitational effect by the Sun on Earth only appears (not real) instantaneous (right angle).



UniversityPhysics, Authored by: OpenStax CNX

Figure 2.22 Curved Space-Time [Fair Use]

- →Curved space–time travels at (c) outward from the Sun← and the Earth orbits this preplaced warped space at a right angle as shown above. Consequently, this function only gives the appearance of an instantaneous pull affect (not real).
- Central mass = Sun; orbiting mass = Earth.
- For reinforcement, as shown above, when the Earth orbits, curved space–time generated from the Sun is already in position. Notice the interaction of the Earth with curved space is always at a right angle (see arrow in Figure 2.22) directly towards the Sun. Therefore, even though gravity waves travel at (c), as a sphere outward from the Sun, the gravitational effect by the Sun on Earth still appears instantaneous, just like Newtonian physics.

A visual presentation of this hypothesis can be found at "What is Gravity? – Newton vs. Einstein."

<https://www.youtube.com/watch?reload=9&v=6cEIPKXj1dU>

PFGRT

In the same manner PFGRT assumes the speed of gravity (inflowing ether), it has only the superficial appearance of being instantaneous. For example, imagine hypothetically, that the Sun with its surrounding inflowing ether (gravitational field) consists of a perfect sphere. In addition, for purposes of this analogy, visualize that the Earth, relative to the Sun is in an absolutely circular orbit. Therefore, the Earth in orbit then intersects/interacts with Sun's preplaced inflow at a **right angle** towards the Sun. In essence, the Sun's inflow acceleration action exerted on the Earth at a right angle appears instantaneous, just like Newtonian physics, even though, in fact, it is not.

This analogy is not totally germane in terms of the true shape of Earth's orbit or the actual three–dimensional configuration of the Sun with its gravitational field. But it does explain the concept.

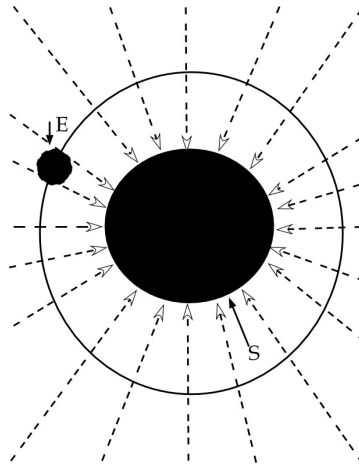


Figure 2.23 Earth's Path is Perpendicular to Inflowing Ether

Central mass = Sun; orbiting mass = Earth

- *E = Earth.*
- *S = Sun.*
- *Dotted lines = Sun's inflow of space or ether into the Sun.*
- *Hollow circle = Earth's orbit.*
- *The Earth in its orbit intersects with the Sun's inflow always at a **right angle**.*
- *This has the appearance of an instantaneous gravitational effect even though it is not.*

GRT vs. PFGRT

Regarding GRT and PFGRT, as just described, both so-called "gravitational effects" appear instantaneous, even though, in fact, that is not true. Fundamentally, both curved space-time, as well as the accelerating inflowing ether, generated by the Sun are prepositioned at a right angle relative to the orbiting Earth.

Therefore, the so-called gravitational interaction appears instantaneous, but in erratum.

2.5 Entrainment

GRT does not postulate entrainment.

PFGRT is only somewhat analogous to the concept of ether entrainment. For instance, assuming the nonrotating inflowing ether represents the gravitational field in today's vocabulary, then large astronomical objects such as the Sun or Earth carry that inflow along with their own motion. This is a form of ether entrainment, but it is not the classical static concept, since there is an inflow.

PFGRT vs. GRT

GRT presumes entrainment does not exist. PFGRT presumptions are somewhat analogous to the concept of classic entrainment.

2.6 The Earth–Centered Frame / Earth’s Gravitational Field/The Preferred Frame (GRT vs. PFGRT)

GRT

GRT assumes the speed of light is (c) relative to the observer (c constant in empty space), but all is not that simple (see further explanation below).

PFGRT

Assuming the Earth–centered inertial frame ECF/the Earth’s gravitational field EGF/the Earth’s inflow of space is the local preferred frame for the speed of light (c) , then relative to the observer, the speed of light is not always perceived as (c) .

For example, by definition, PFGRT assumes that the ether flows inwards towards the Earth. In addition, light travels within it at (c) . This is the local preferred frame for light on Earth. Therefore, an observer located adjacent to Earth, viewing light traveling towards him/her, moreover, straight to the Earth, perceives its velocity as (c) plus, the velocity of the inflow at that location. Conversely, an observer who is positioned far from the Earth, viewing light traveling directly from Earth, moreover, straight towards him/her, perceives its velocity as c minus, the velocity of the inflow at that locality.

In combination with the above postulates, and again, assuming the nonrotating inflowing ether/the gravitational field is the preferred frame for the speed of light, then any observer traveling at a transverse velocity relative to this frame also perceives the speed of light as (c) plus or minus his/her velocity relative to that radial frame. As an aside, the author does not know whether or not the density of the ether affects the speed of light.

Therefore, assuming PFGRT (gravitational field of Earth) is the local preferred frame for the speed of light, then the speed of light is not in all cases equal to (c) as perceived from the frame of the observer.

GRT vs. PFGRT

This specific comparison is very abstract. Therefore, in the author’s opinion, it will be challenging for the average individual to grasp the following concept.

GRT posits that, relative to the observer, the speed of light within a gravitational field is (c) . However, this only occurs if both are located inside the same accelerated frame. In contrast, an observer located in a different frame, viewing light traveling through that other frame can perceive the velocity of light as other than (c) . Again, strictly speaking, the observer of GRT views the speed of light as (c) **within** all accelerated reference frames, but only when both the light and the observer are located in the same reference frame.

Alternatively, PFGRT presumes the speed of light is relative to the gravitational field (EGF), or expressed in other terminology, The Earth–centered frame (ECF), nonrotating inflowing space, and nonrotating inflowing ether. Therefore, as a function of this assumption (EGF/ECF), then from the perspective of the observer, the speed of light is not always perceived as (c) .

So which theory is simpler? What’s more compatible with actual reality? Listed below is that answer. There are four observations and/or experiments explained supporting ECF/EGF/PFGRT.

1. The global positioning system (GPS) uses only the Earth–centered frame as the preferred frame for the speed of light, not the observer’s frame.

2. NASA, when communicating by radio waves from Earth with deep solar system space probes, uses only the Sun–centered frame analogous to the ECF as the preferred frame for the speed of light, again not the observer’s frame.

3. Experiments have established that it takes radio waves, bounced off satellites, from Japan to the United States, and then vice versa, longer to travel west to east compared to east to west. Yet again, this is consistent with an Earth-centered frame.

4. Experiments have also confirmed that radio waves, bounced from satellite to satellite around the globe, and then back to their origin, take a longer time traveling west to east as compared to east to west. Once more, this is consistent with an Earth-centered frame.

As a result, given the above supporting evidence, which theory is more consistent with reality? Is the preferred frame for the speed of light relative to the observer or else relative to the gravitational field? At least, for the author, the answer is obvious.

2.7 Global vs. Local Experiments (GRT vs. SRT)

The above four observations and experiments which contradict SRT are dismissed by the majority of today's physicists by invoking rotation and acceleration, then defined as the Sagnac effect and for that reason, still consistent with relativity (GRT), just not SRT. So where in the universe are there no fields of acceleration—solar systems, galaxies, or groups of galaxies? In the author's opinion, it is apparent that all of the objects of the universe are connected with fields of acceleration of some sort. In essence, within the universe, true linear inertial motion does not exist, because gravitational fields (acceleration) are universal.

This supposition eliminates true linear motion, moreover, leaves only the global experiments, which demonstrate that the speed of light is not relative to the observer, rather a function of the gravitational fields produced by mass (nonrotating inflow of space/ether).

For some inexplicable reason, modern-day physicists assume that only physically small linear experiments, such as the MMX, are the gold standard for determining whether or not the ether truly exists. **This is because they presuppose, with reference to these small experiments, that one can then disregard rotation (acceleration), as well as the curvature of the Earth since their effect is supposedly infinitesimal.** Essentially, they ignore the gravitational field. And for this reason, it is assumed they are not Sagnac experiments.

In contrast, all large global experiments by default must involve acceleration/rotation, as they exist within a spherical gravitational field generated by mass, and moreover, involve the Earth's rotation. Therefore, they are assumed to be a function of the Sagnac effect.

Principally, if only matter generates the preferred frame for light in a shape of a sphere (gravitational field) what other option is there? Technically speaking, there are no purely inertial frames.

Given the above, here is a crucial consideration. If it can be demonstrated, as presented in Chapter 3, that the MMX's null outcome (a small linear experiment) is also a function of the ether's existence, rather than purely a proof of its absence, thus indeterminate, then one is left only with the large global experiments.

So presuming this outcome can be proved, the global experiments, by default, represent the true reality. If this indeed is the case, the global experiments provide evidence, moreover, proof, that the speed of light is not relative to the observer but a function of the gravitation field or by the definition of this publication, the inflowing ether.

2.8 Conundrums Associated with PFGRT

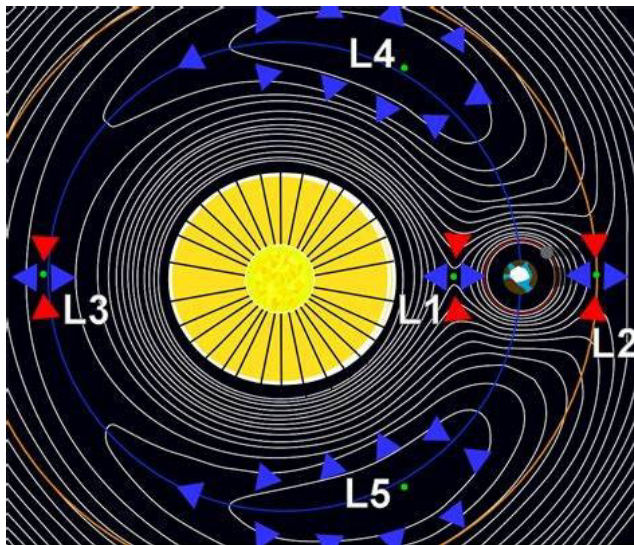
There are some major glitches associated with both PFSRT and PFGRT, so obviously, as with all theories, they are incomplete. Now the better the theory, the closer it is to the ultimate reality of universe. Even so, we may approach the ultimate answer but may never quite get there. Listed below are three conundrums associated with PFGRT.

1. As the ether flows into matter, where does it go? A logical response is that if it enters into existence between the galaxies to produce the expansion of the universe, then as it leaves the universe, through matter, it goes to from where it came. This brings up the age-old question, where does the universe originate from, or more to the point, where do we come from? At present, both questions are unknowable; then again, perhaps there is an architect (creator).

2. Why does the inflowing ether (gravitational field) not rotate along with the Earth? Good question. Perhaps, it is anchored in another dimension (where it originated from and where it goes to). But this is a very poor and speculative answer.

3. How do the different inflows of PFGRT interact with one another (e.g., Sun vs. Earth)? This is one primary conundrum of this theory. There is a big difference as to how the inflow of the Sun interacts with a small object versus a large astronomical mass like the Earth, possessing its own independent inflow.

For example, with respect to large interacting astronomical objects, one inflow (Sun) must then interact with another inflow (Earth). But how does this transpire? Basically, the acceleration of the Sun's inflow must somehow interact at a right angle with the Earth's own intrinsic inflow. Otherwise, the Earth would not orbit the Sun. This is hard to envision, so it must be complex. Refer to Figure 2.24 below.



Wikimedia Commons

Figure 2.24 Lagrange Points Relative to the Earth's Orbit [Fair Use]

There are actually five Lagrange points. The one not discussed is located on the other side of the Sun relative to Earth (L3). It is not presented, because it is not part of this concept. However, this is the reason why they are numerically labeled as depicted above.

For instance, with respect to the Earth's orbit around the Sun, there are five Lagrange equilibrium points. Objects placed there, while in orbit around the Sun, maintain their position, relative to Earth. One is located radial, distal to the orbit of the Earth (L2). Another is sited radial proximal to the Earth's orbit (L1). These two positions are unstable, therefore, rapidly decay. There are two others (L3 is behind the Sun and not relevant to this discussion). One is located in front of the Earth's orbit, and the fourth follows the Earth's orbit, (L4 and L5).

Alternatively, these points are stable. Nevertheless, as shown in Figure 2.24, when an object is placed there, it exhibits a large elliptical orbit around a central Lagrange point. This function is depicted by the adjacent parallelovals surrounding L4 and L5 as pictured.

Consequently, in order to account for these diverse observations, the Sun's inflow with respect to the Earth's inflow must be very multifaceted. One can visualize possible solutions, →such as classic eddy currents←, but they are complex, messy, and confusing. So, for now, this puzzle remains unsolved.

2.9 Conclusion

PFGRT posits a single preferred frame for the velocity of light, inertia/gravity, the "rate of time, and the perception of motion distance" which locally is the Earth's gravitational field (inflow of the ether). For the most part, both GRT and PFGRT produce similar outcomes but not identical. Nevertheless, the major advantage with reference to PFGRT is that it is simpler (Occam's razor), furthermore, more compatible with observed reality. But, perhaps, most importantly with the presumption of **the ether**, PFSRT, PFGRT, and QM can then be assembled into one overall unified theory as imparted in chapters 3 and 4.

For a somewhat analogous theory of inflowing space (ether), please refer to the publication given below written by Duncan Shaw.

On Maxwell's 1865 Theory of Aether: A Step Toward Unity
Physics Essays in its September 2020 issue (Vol. 33 No. 3)

CHAPTER 3

THE MMX AND OTHER SPEED OF LIGHT EXPERIMENTS

Abstract

This is the third chapter of the publication titled *The Ether*. The intent of this chapter is to revise the assumptions associated with Einstein's relativity theories, thereby postulating an alternate theory, somewhat analogous to Einstein's concepts, however, now compatible with the existence of the ether. As a result, relativity and quantum mechanics, rather than being disconnected, are then a part of one overall unified theory.

This is the most important chapter of this book for it demonstrates that the local preferred frame for the speed of light on Earth is its own gravitational field/Earth-centered inertial frame/inflow of ether. Additionally, it gives explanation as to why the Michelson–Morley Experiment (MMX), as well as other experiments, →as classically performed/interpreted←, is silent as to whether or not the ether exists. Given this presupposition, the other four chapters in this publication then have meaning, and moreover, merit.

3.1 Introduction

Chapter 3 is the quintessential subject matter of this entire publication for everything else in this book depends upon what is presented in this chapter. That is, proof of the existence of the ether. Many former scientists (Maxwell and Tesla), as well as more contemporary physicists/individuals (Ives, Lindner, and Stillwell), believed or still believe in the ether. Even so, because the vast majority of modern-day physicists presuppose there is no ether, their ideas have been ignored or alternatively dismissed. For that reason, the primary objective of this chapter is to demonstrate that there is, in fact, an ether. So, assuming it exists, all of physics, including relativity and QM, must then be reassessed, furthermore, rewritten, based upon **the ether**.

In this section, all theories are based on the assumption that the Earth-centered non-rotating inertial frame/gravitational field/inflow of space is the local preferred frame for the speed of light on Earth. Everything else depicted in this section derives from this basic assumption. Keep in mind that all three terms are synonymous. Additionally, it should be noted that the term "Inflow of Space" (ether) as defined in Chapter 2 is new and not generally accepted by mainstream physics.

Therefore, for ease of understanding, generally, although within this chapter, not exclusively, I will use the phrase "Earth-centered, nonrotating inertial frame" (ECF) or "Earth's gravitational field" (EGF).

Numerous small linear speed-of-light experiments, when performed on the Earth's rotating surface, have demonstrated only isotropy. The most well-known is the MMX. Einstein/mainstream physicists eventually used its null result as the main foundation block for validating his relativity theories.

Given that, if it can be demonstrated that even in the presence of an ether wind, the MMX still produces the same null outcome as classically performed/interpreted, then it is silent as to whether it exists. As a result, relativity collapses.

Presented below are five observations and/or experiments that together demonstrate or, perhaps, even prove, that the ECF/EGF is the local preferred frame for the speed-of-light/rate of time on Earth. First, read and comprehend them. Then, in conjunction with what is assumed to be the overlooked physics of the MMX, they will be used to reveal the reason why all second-order speed of light experiments of this type, when performed on the rotating surface of the Earth, exhibit isotropy. In other words, what Chapter 3 will establish is that, even though the ether wind exists, these kinds of small linear experiments (e.g., MMX) as classically performed/evaluated/interpreted are all inherently incapable of detecting it.

The five observations and/or experiments are listed below.

1. The Pendulum
2. Aberration
3. West-east, east-west satellite transmission
4. Hafele and Keating
5. GPS system

One—The Pendulum

As previously described in Chapter 2, a pendulum placed in motion at either of the Earth's poles is perceived by the observer to rotate (precess) 360 degrees every 24 hours. Alternatively, a pendulum sited at the equator does not rotate at all. However, at the poles, it is not the pendulum that is rotating, rather, it is the observer. What does this signify? →It indicates the EGF/ECF does not rotate along with the Earth's axial spin←. Essentially, this function is the product of the conservation of momentum within a nonrotating gravitational field. The non-rotating gravitational field also explains the Coriolis effect, for if the gravitational field rotated along with the Earth axial spin, then weather patterns, as observed, would not occur.

Two—Aberration

See Figure 3.1 below. There is a phenomenon known as stellar aberration. So, what is it? Here is an analogy. Assume that raindrops fall straight down directly to the Earth's surface. Therefore, relative to this frame, if you are located within a stationary car, from your viewpoint, the rain appears to drop perpendicular to Earth's surface.

On the other hand, if the car possesses a transverse velocity, then from your perspective, the rain appears slanted towards the motion of the car. In addition, with respect to the ground, if you have no visual reference frame, and if you cannot feel acceleration, then as you move from stationary to a velocity, rather than you, the position/angle of the rain appears to change.

What this indicates is that there is a fixed frame for the rain (preferred frame); in this case, it is the atmosphere, whereby rain falls directly straight down to Earth, as depicted below on Figure 3.1.

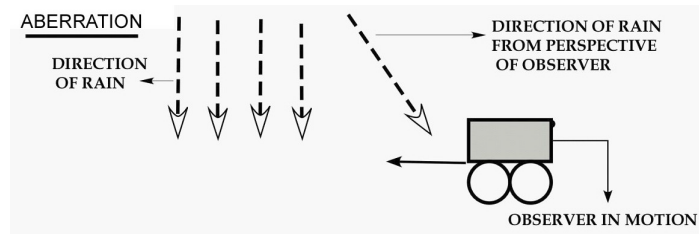


Figure 3.1 Aberration of Rain

Again, if rain falls straight down, perpendicular to the Earth's surface, and if the observer within the car possesses a transverse velocity relative to the rain, then from the perspective of the observer, the rain appears slanted towards the motion of the car. This is aberration. It indicates there is a preferred frame for the rain, in this case, the atmosphere.

Similarly, the identical phenomenon is observed with respect to starlight, called **annular** stellar aberration, as explained in the following anonymous quote from the website: antireality.com/stellaraberration.htm.

If you watch the stars (using the necessary equipment) over the course of a year, you'll note that they move about in little ellipses. The paths of the stars over the poles (or more precisely, above the plane of the Earth's orbit) will be almost circular, while the paths of those near the equator will be flat. This effect is called annular stellar aberration. Unlike parallax, this affects all stars equally, no matter what their distance.

You'll note that annual stellar aberration affects all stars, so this effect is different from parallax. Since it equally affects stars that are at any distance from the solar system, and since the effect varies with a star's distance from the Earth's orbital plane (an imaginary plane that intersects with the Earth's orbit), then we know that this effect is somehow due to the Earth's motion as it goes around the Sun each year.

Annular stellar aberration is the effect well known by astronomers to cause stars to shift 20.5 arc seconds in their location in the sky. The amount of apparent positional change is governed by the time of year and location in the sky with regard to the Earth's orbit around the Sun. The number also mathematically correlates perfectly with the Earth's speed around the Sun compared to the speed of light.

If you understand relativity, you should have immediately picked up that light between an emitter and an observer should have no relation with some third object. Yet we find stellar aberration is perfectly related to a third object: Our speed with respect to the Sun. They have picked the Sun as the center of a preferential reference frame and have no idea why they did it.

At least two forms of stellar aberration exist as observed from Earth: **annular** (Sun) stellar aberration and **diurnal** (Earth) stellar aberration. Obviously, starlight travels within the Sun's gravitational field (SGF), then later within the Earth's gravitational field (EGF). Both are local preferred frames for the speed of light as corroborated by the following observations.

Annular Stellar Aberration

As the Earth orbits around the Sun, its velocity and angle continually change relative to starlight located within the preferred frame of the (SGF). Consequently, as observed from Earth, throughout the time frame of a year, the position and angle of the starlight also con-

tinually changes. This is not stellar parallax, which is a totally different phenomenon. Below are figures 3.2 and 3.3 which depict analogous forms of aberration.

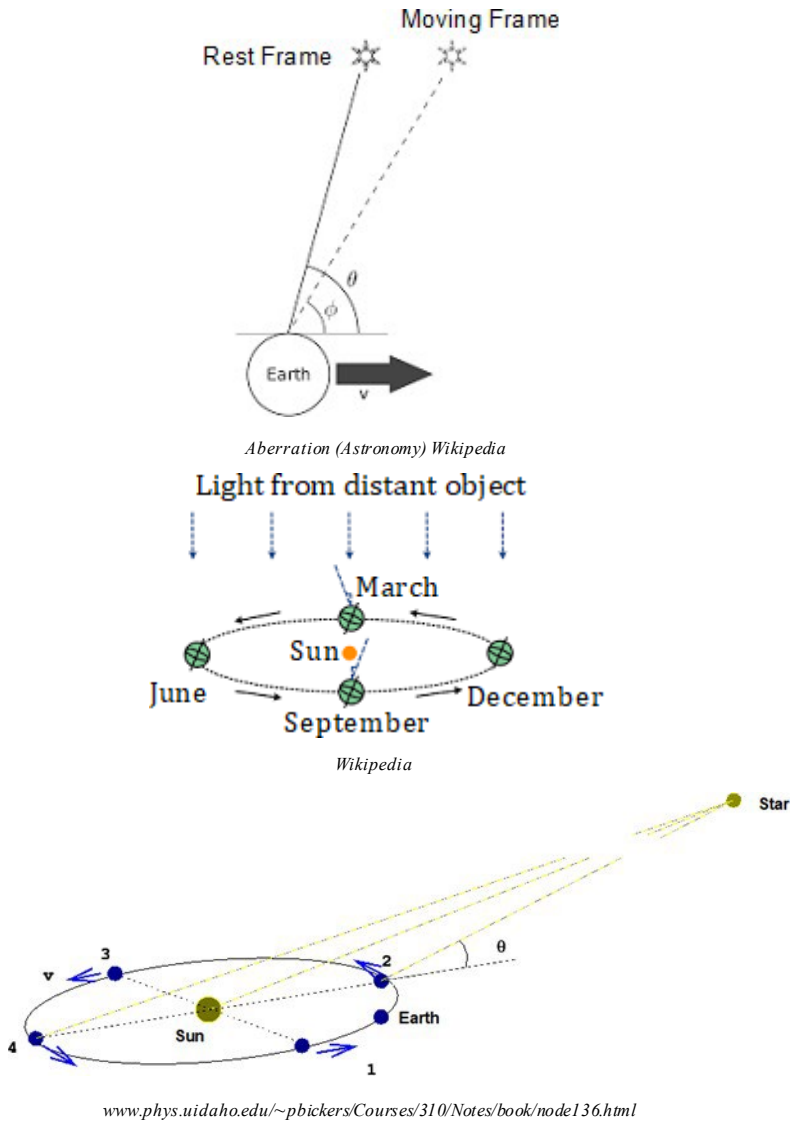


Figure 3.2 Stellar Aberration [Fair Use]

- Remainder of caption below refers to the lower image above. Please apply that concept to the upper two images.
- The central, larger dot represents the Sun with the Earth orbiting around it, labeled 1, 2, 3, 4.
- The smaller dot located to the far right portrays a star.
- As the Earth orbits the Sun, then as a function of annular stellar aberration, the apparent position of the star changes.
- Note this diagram does not depict solar parallax.

Diurnal Stellar Aberration

In the same way as the Earth revolves on its own axis every 24 hours, the observer, who is on Earth, changes his/her velocity/angle relative to the starlight located within the preferred frame of the EGF. See Figure 3.3 below. Therefore, over the time span of 24 hours, the apparent position and angle of the starlight continually changes. So what does this indicate? It signifies light is not relative to the observer (c in empty space). It means that there are fixed non-rotating frames where light travels within. What is more, they are preferred frames, identified by different names, one of which is called the gravitational field (inflow of space or ether).

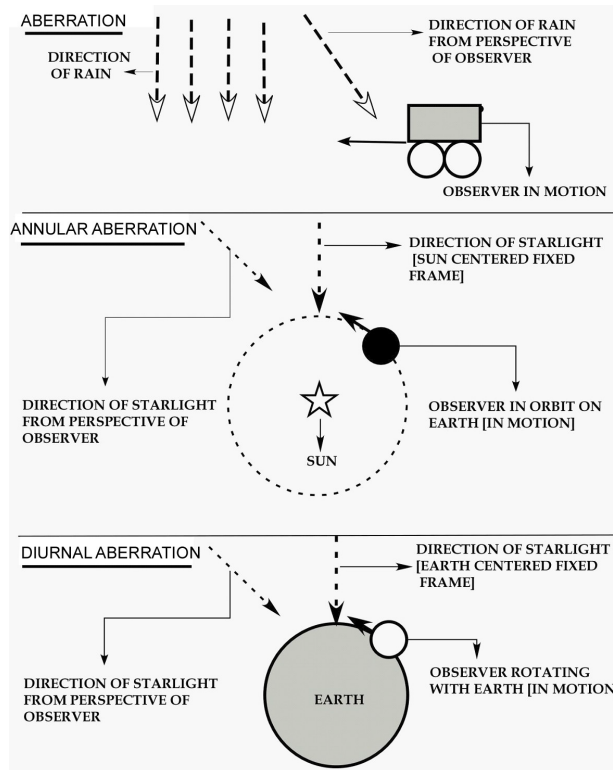


Figure 3.3 Rain, Annular and Diurnal Aberration

- *Figure 3.3 demonstrates analogous forms of aberration.*
- *Top = rain aberration with atmosphere as the preferred frame.*
- *Middle = annular stellar aberration with the Sun's gravitational field as the preferred frame.*
- *Bottom = diurnal stellar aberration with the Earth's gravitational field as the preferred frame.*

Einstein's SRT can also account for stellar aberration, but SRT assumes the magnitude of stellar aberration is a function of the relative velocities of the observer vs. emitter. But notice this fact carefully: Not all stars have the same velocity relative to the observer on Earth. So, if Einstein's SRT assumptions are germane, then different stars should possess varying amounts of aberration.

However, this is not what is actually observed. What we perceive is this: relative to the plane of the Earth's orbit around the Sun, no matter how far, and regardless of a star's velocity, with

respect to the observer on Earth, all stellar aberrations are identical. Again, from the website anti-relativity.com:

The effect varies with a star's distance from the Earth's orbital plane (an imaginary plane that intersects with the Earth's orbit). You'll note that stellar aberration affects all stars, so this effect is different from parallax. Since it equally affects stars that are at any distance from the solar system, and since the effect varies with a star's distance from the Earth's orbital plane (an imaginary plane that intersects with the Earth's orbit), then we know that this effect is somehow due to the Earth's motion as it goes around the Sun each year.

The paths of the stars over the poles (or more precisely, above the plane of the Earth's orbit) will be almost circular, while the paths of those near the equator will be flat. The number also mathematically correlates perfectly with the Earth's speed around the Sun compared to the speed of light.

For this reason, SRT cannot be correct.

In contrast, PFGRT is consistent with actual observations, whereby annular stellar aberration is a function of the velocity/angle of the observer on Earth, relative to starlight located within the preferred frame of the SGF. So, with respect to this frame, all aberrations are the same. Again, this is called annular stellar aberration. In addition, there are two forms of stellar aberration, annular and diurnal. This duality cannot occur if the preferred frame for light of (c) is only from the perspective of the observer (SRT).

What is more, observer aberration also gives explanation why, from the frame of the observer on Earth, the apparent instantaneous, but not real, acceleration effect on the Earth towards the Sun (see Chapter 2, Speed of Gravity) does not match the visual position of the Sun. In essence, the apparent but not real, instantaneous gravitational pull position of the Sun is about 20 arc seconds east of its visible position. This is a function of observer aberration of sunlight from the frame of the Earth as it orbits about the Sun. Notice, in this case, the preferred frame for light is the Sun-centered frame/Sun's gravitational field/Sun's inflow of **the ether**. This is analogous to the fixed frame for light relative to the Earth, its gravitational field/inflowing ether.

For further clarification and from another perspective, sunlight travels outwards from the Sun in the form of a symmetrical radiating sphere, and the observer on Earth, (which is in orbit around the Sun) is moving at a transverse velocity relative to that radially outward spherical light frame, thus observer aberration.

In addition, the acceleration function of the inflow of space (ether) or as classically defined, the gravitational field has only the appearance (not real) of an instantaneous so-called "pull effect" on the Earth (again see Chapter 2, Speed of Gravity).

This action is at a radial right angle relative to the Earth as it orbits around the Sun. And so, as a result of these two different interacting factors, from the perspective of the observer on Earth, the →apparent← instantaneous gravitation-pull position (inflow of space) by the Sun exerted on Earth (right angle) does not correspond to the Sun's visual position. Observe again, in this instance, the preferred frame for light is the Sun-centered frame not the observer.

There is another factor to take into consideration, moreover, paramount in order to comprehend this aberration concept. Within the fixed frame of the SGF/EGF, light is captured or entrained by that frame, furthermore, in an inflowing nonrotating manner. So, inside that frame, if there is relative motion of the source and/or observer, then classic source vs. observer, aberration occurs as well as longitudinal and transverse Doppler effects.

Essentially, →a beam← of a given length of light located within a fixed frame (gravitational field) can move longitudinally, as well as transversely, through that frame, even though still entrained by that inflowing frame. So light leaving a star traveling towards Earth is entrained

(fixed) first by the star's gravitational field, then as it travels through the galaxy by its gravitational field, then by the SGF, and finally, by the EG F. This occurs even though these separate gravitational fields (fixed frames) move at a velocity relative to one another.

In summary and for reinforcement, the gravitational field (inflow of space or ether) fixes the light within that specific frame but still allows for source and observer aberrations in that same frame. In addition, this same concept explains the transverse and longitudinal Doppler effects again within the same gravitational field frame. Bear in mind that transverse and longitudinal Doppler effects would not occur devoid of some functional process that produces source/observer aberration.

Even though in erratum, observer aberration, specifically within a single gravitational field frame (Sun), was used by Bradley as a proof of the speed of light as c , furthermore, supposedly validating SRT. See quotation below. **However, in reality, it (c) is related to the reference frame of the Sun's gravitational field (PFGRT).** In essence, Bradley calculated (c) correctly but mistakenly posited the wrong reference frame. As British physicist Philip Gibbs wrote in 1997:

In 1728, James Bradley made another estimate by observing stellar aberration, being the apparent displacement of stars due to the motion of the Earth around the Sun. He observed a star in Draco and found that its apparent position changed throughout the year. All stellar positions are affected equally in this way. (This distinguishes stellar aberration from parallax, which is greater for nearby stars than it is for distant stars.) To understand aberration, a useful analogy is to imagine the effect of your motion on the angle at which rain falls past you, as you run through it. If you stand still in the rain when there is no wind, it falls vertically on your head. If you run through the rain, it comes at you at an angle and hits you on the front. Bradley measured this angle for starlight, and knowing the speed of the Earth around the Sun, he found a value for the speed of light of 301,000 km/s.

It should also be noted that source aberration of binary stars has never been observed from Earth. There are several possibilities for this fact now posited.

First, perhaps this is because, again as observed from Earth, different fixed frames or gravitational fields (star, galaxy, Sun, and Earth) are all moving at different velocities relative to one another. This circumstance results in observer aberration of the binary stars together, functioning as a single unit but masks the two different individual source aberrations as those stars orbit one another.

In other words, from the Earth's observer frame of reference, differential source aberration of the binary system exists. However, it is markedly reduced from what would be expected, assuming light is emitted directly from the two stars to the observer on Earth without interacting with the different intervening nonrotating gravitational fields, all of which are traveling at differing velocities relative to one another.

Second, alternatively, binary stars, which are orbiting one another, then generate a very complex single gravitational field (fixed frame) which may compensate, therefore negate, their different source aberrations.

Third, the emitted light of the source stars is in the form of a complex sphere (complex fixed frame), whereas from the observer reference frame on Earth, that light is in the same shape of a pencil beam.

Fourth, source aberration of binary stars is based upon spectral analysis of light, whereas observer aberration is based upon starlight position. As a result, there may be unaccounted factors that do not make them equivalent.

These are possible explanations for why. From the reference frame of the observer on the orbiting Earth, observer aberration is measured within a single gravitational field such as as-

sociated with our Sun or else from starlight emitted from a single star. But on the other hand, regarding binary stars, a gain from the reference frame of Earth, differential source aberration is not apparent.

Three–West–East, East–West Satellite Transmission

Radio waves transmitted via satellite from Japan to the United States take a longer amount of time than vice versa. Similarly, radio waves that are sent, via satellite–to–satellite, around the Earth’s equator, then back to their origin, take longer traveling west to east than east to west. So what does all this indicate? It signifies that the ECF/EGF is the local preferred frame for the speed of light. Thus, as a function of the Earth’s axial rotational spin, relative to within the EGF/ECF, so it then takes light a longer interval of time to travel west to east as compared to east to west.

Four–Hafele and Keating

See Figure 3.4 (Hafele and Keating).

During October 1971, four cesium atomic beam clocks were flown on regularly scheduled commercial jet flights around the world twice, once eastward and once westward, to test Einstein’s theory of relativity with macroscopic clocks. From the actual flight paths of each trip, the theory predicted that the flying clocks, compared with reference clocks at the U.S. Naval Observatory, should have lost 40 ± 23 nanoseconds during the eastward trip and should have gained 275 ± 21 nanoseconds during the westward trip. Relative to the atomic time scale of the U.S. Naval Observatory, the flying clocks lost 59 ± 10 nanoseconds during the eastward trip and gained 273 ± 7 nanosecond during the westward trip, where the errors are the corresponding standard deviations. (Rod Nave, Department of Astronomy and Physics, University of Georgia)

For the benefit of the nonscientist, this is the author’s explanation of the Hafele and Keating experiment. Relative to the baseline clock sited on the rotating surface of the Earth, if one compares the amount of time it takes for the two atomic clocks to travel by airplane around the Earth, from west to east as compared to east to west, the west–east clock takes longer. See Figure 3.4 below.

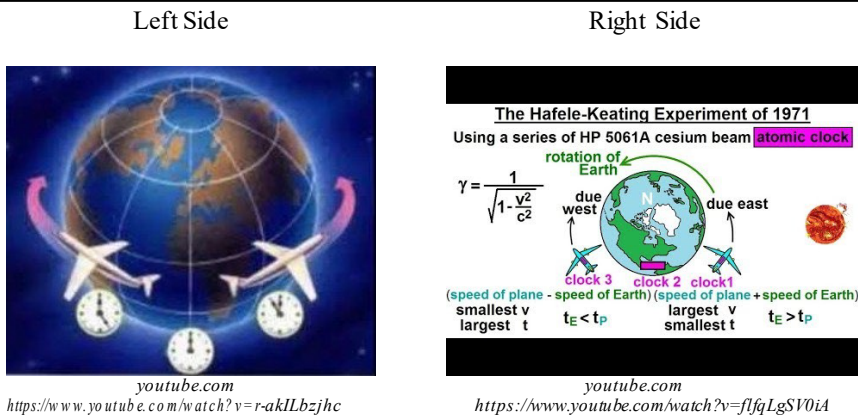


Figure 3.4 Hafele and Keating [Fair Use]

With respect to traveling around the Earth, it takes a longer amount of time for the clocks to travel west to east as compared to east to west (atomic clocks aboard aircraft).

What does this experiment signify? It indicates that relative to the EGF, the west–east clock possesses a higher velocity compared to the east–west clock. As a result, its "tick rate" is slower. This consequence can only occur if there is a preferred frame, EGF/ECF.

The YouTube site below contains a video describing an experiment supporting the concept that the "rate of time" of an atomic clock is a function of its velocity relative to the Earth–centered frame (EGF) just like the Hafele and Keating experiment.

<https://www.youtube.com/watch?v=G-7ImOWnxQ8>

However, it is a more precise experiment. Nonetheless, the author of the website describes the experiment as a function of frame dragging. Alternatively, it is this author's opinion that his conclusion is an erratum. The experiment actually demonstrates differential "time dilation" of an atomic clock as a function of velocity relative to the Earth–centered frame/gravitation field/inflow of space–ether.

As a corollary, an atomic clock positioned at the equator ticks slower (1,000 mph relative to the EGF, ECF ether) compared to an identical atomic clock located at a higher latitude (<1,000 mph with respect to the ECF, EGF, ether). This measured outcome, as chronicled by single orbiting satellite, is a function of their different velocities relative to the nonrotating ether (EGF, ECF).

Five–GPS System

The GPS basically proves PFGRT as correct. (See figures 3.5 and 3.6 below, moreover, the following citation.)

The following YouTube figure (left), sponsored by NASA LaRC Office of Education, partially describes how the GPS functions.

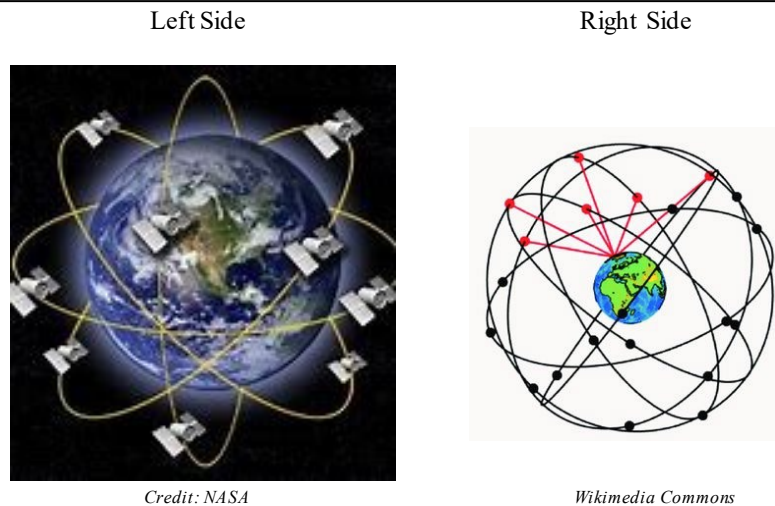


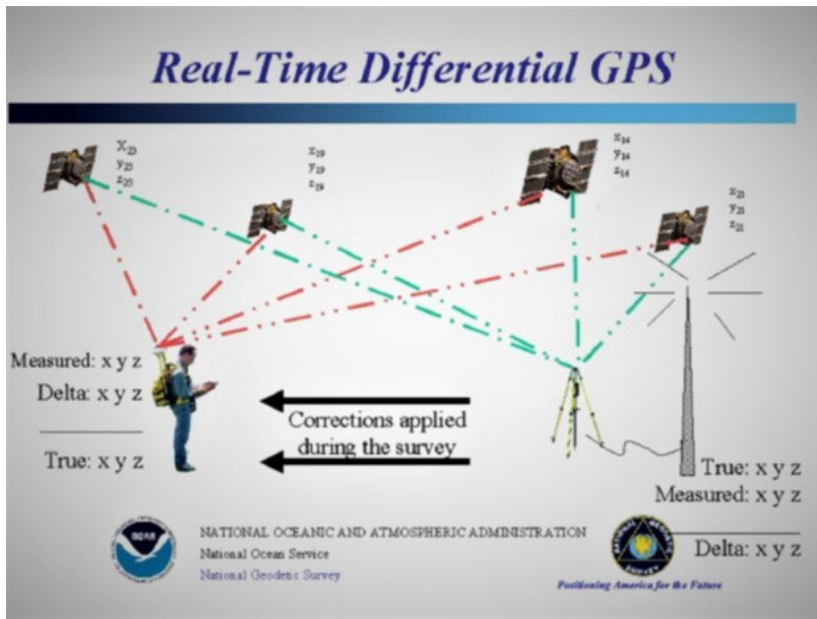
Figure 3.5 GPS System [Fair Use]

This is an illustration of the GPS system from NASA (left):

Each GPS satellite transmits data that indicates its location and the current time. All GPS satellites synchronize operations so that these repeating signals are transmitted at the same instant. (They are synchronized with an Earth–bound baseline clock.) The signals, moving at the speed of light, arrive at a GPS receiver at slightly different times, because some satellites are further away than others.

<https://www.youtube.com/watch?v=0n0T992ccik>

This begs the question, by what methodology are the atomic clocks of the GPS synchronized in order for the system to function correctly? Physicists do use some of Einstein's relativity equations, nevertheless, only with reference to the ECF, not the observer. Basically, they utilize two factors for synchronizing the orbital clocks with the Earth-based baseline clock: the first is the altitude of the orbit and second, the velocity of the orbit.



National Ocean And Geographic Administration

Figure 3.6 Another Example of the GPS System [Fair Use]

The distance to the GPS satellites can be determined by estimating the amount of time it takes for their signals to reach the receiver. When the receiver estimates the distance to at least four GPS satellites, it can calculate its position in three dimensions.

There are at least 24 operational GPS satellites at all times plus a number of spares. The satellites, operated by the U.S. DoD, orbit with a period of 12 hours (two orbits per day) at a height of about 11,500 miles traveling at 9,000 mph (3.9 km/s or 14,000 kph). Ground stations are used to precisely track each satellite's orbit.

<http://www.PocketGPSWorld.com>

With respect to the first (altitude), the higher the orbit, the weaker the gravitational field, so the tick rate of the atomic clock increases. And for the second (velocity), the closer to Earth, the faster the orbital velocity, thus the slower is its tick rate. Once again, the adjustments are made relative to the ECF but, most importantly, not from the perspective of the observer. With reference to the new lexicology of this article as defined in chapters 1 and 2, the synchronization process can be described this way; however, first, in order to comprehend the following explanation, one must understand and accept the assumptions presented in those two chapters. The inflowing ether EGF/ECF accelerates and self-compresses as it streams in towards Earth. As a result, the closer a clock is to the Earth, the greater is the velocity/density of the inflow. Therefore, the clock's tick rate decreases. As the orbital velocity of the clock in-

creases, the closer it is to Earth; then its transverse motion relative to the inflow also increases. And for that reason, its tick rate then again decreases.

But that is not all. The GPS system also uses the ECF as the preferred frame for the speed of light, not the observer. So, in order to determine the correct position on Earth, relative to the ECF, both the orbital velocity of the satellite, as well as the rotational velocity of the desired location on Earth, must be factored in. Once again, this is not from the perspective of the observer.

What the GPS proves is this: →The EGF/ECF is the local preferred frame for the speed of light on Earth, moreover, the frame that also determines the "rate of time."← In contrast, presuming the GPS used the observer for the preferred frame, in all likelihood, it would be too complicated to function properly. In that case, each satellite's clock would have a constantly changing velocity relative to all the other satellites, with their clocks, as well as to the Earth-based clock. Even so, theoretically, it could be made to work, nevertheless, only with the use of extremely complex mathematics. It is important to note that this would violate Occam's razor.

These five observations and/or experiments in conjunction basically prove that the ECF, EGF is the local preferred frame for both the speed of light, as well as the rate of time. Fundamentally, the local preferred frame for the speed of light on Earth is its own gravitational field. This basic assumption will now be applied to the Michelson–Morley experiment (MMX).

3.2 The Michelson–Morley Experiment (MMX)

The author has decided to make this specific section redundant, not for the sake of the physicist, for he/she will readily understand the concepts presented, but rather to underscore their significance. The author has composed it in this manner for the benefit of the apprentice. This is because, in the author's opinion, the concepts described here within are somewhat visually abstract, especially for the nonscientist.

For that reason, the same concepts are presented multiple times and from different perspectives. Hopefully, for the novice, this repetitive methodology will aid in his/her ability to grasp the ideas presented.

As already described, large global experiments/observations all involve rotation within the EGF, but more importantly, they demonstrate anisotropy. In contrast, small extremely high-quality linear experiments, performed on the Earth's rotating surface produced isotropy. Some of them were not pursuing the Earth's axial spin velocity. Nevertheless, they should have been sensitive enough to detect it. In fact, there have been so many that it is not realistic to assume that if there is a fault, it lies with poorly designed equipment or the experimenter.

Once again, with regard to the global experiments, there is irrefutable evidence that the local preferred frame for the speed of light is synonymous with the Earth's gravitational field ECF/ether inflow of space/ether. In addition, they directly measure the speed of light predominantly in a vacuum. However, given that they all involve acceleration, rotation, and curvature, they are then considered Sagnac experiments (GRT), thus not contradictory to SRT.

Viewed from another perspective, if a gravitational field is the **only** preferred frame for the speed of light, furthermore, as a product of mass (matter), then all preferred frames for light must be connected with a sphere/gravitation field/acceleration of some sort. How could it be otherwise? And so given the above assumption, what other option is there?

Alternately, there is solid evidence derived from numerous small local linear experiments, when performed on the rotating surface of the Earth, that the speed of light is isotropic. But notice this fact very carefully. These second-order local experiments do not directly determine the speed of light, rather they measure (mathematically) "interval of time" as a direct function of "distance through the ether." The latter phrase is defined within this article as **geometry**.

Therefore, if one posits that there is a fundamental error related to this geometry, which has been overlooked, then this presumed fact explains the discrepancy between the global vs. local experiments. In addition, it is more likely that the fault lies with the local experiments, since the global experiments are so overwhelmingly convincing, as well as practical. Furthermore, they directly measure the speed of light. What is more, there are some local experiments (Brillet and Hall), which hint that the EGF is the local preferred frame for the speed of light on Earth.

MMX

Michelson and Morley were not searching for the Earth's axial spin velocity, rather the Earth's orbital velocity around the Sun (67,000 mph = 0.4 fringe shift). In addition, the experiment was not sensitive enough (0.04 fringe shift) to detect the Earth's axial spin velocity at the latitude of the experiment ($< 1,000 \text{ mph} \leq 0.006$ fringe shift). Nevertheless, many other super-sensitive high-quality second-order experiments have confirmed the MMX's null result.

This segment describes "overlooked physics," that when taken into account, produce a null outcome, for all second-order experiments of this type as classically performed/interpreted, even in the presence of the ether wind. Given the fact that the MMX is so well known, moreover, considered by many as proof of relativity, it will be used as the model.

Before proceeding further, if one is not familiar with the MMX, then it will be highly helpful to peruse Appendix D, which describes the MMX in much greater detail. Only then will one be able to fully appreciate the following assumptions and conclusions. In addition, for the beginner, viewing the YouTube websites listed below will simplify one's understanding behind the physics of the MMX. It is much easier for the novice to clearly grasp its function by watching a visual presentation, rather than reading a written one.

<http://www.youtube.com/watch?v=7qJoRNseyLQ>

<http://www.youtube.com/watch?v=uMaFB3jM2qs>

<http://www.youtube.com/watch?v=Z8K3gcHQiqk>

On the other hand, if one already has sufficient expertise, please skip to the paragraph beginning with the *.

Classical Interpretation of the MMX

Listed below are quotes the author has modified describing the classical interpretation of the MMX written by Michael Fowler, Ph.D. (The words in parentheses are mine.) Figure 3.6 is from the original MM paper by Michelson and Morley. With respect to this adapted interpretation, it is assumed that the EGF/ECF is the preferred frame for the speed of light as demonstrated by the global experiments. For that reason, there is a relative ether wind equal to the Earth's rotational spin velocity at the latitude of the experiment.

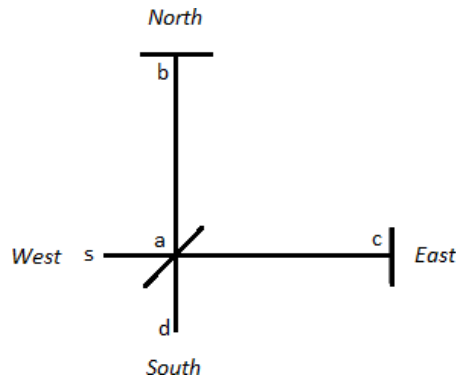


Figure 3.7 MMX Setup [Fair Use]

- The source of light is at *s*.
- The 45-degree line is the half-silvered mirror.
- *b* and *c* are mirrors.
- *d* is the observer.
- The horizontal axis is west–east and east–west.
- The vertical axis is south–north and north–south.

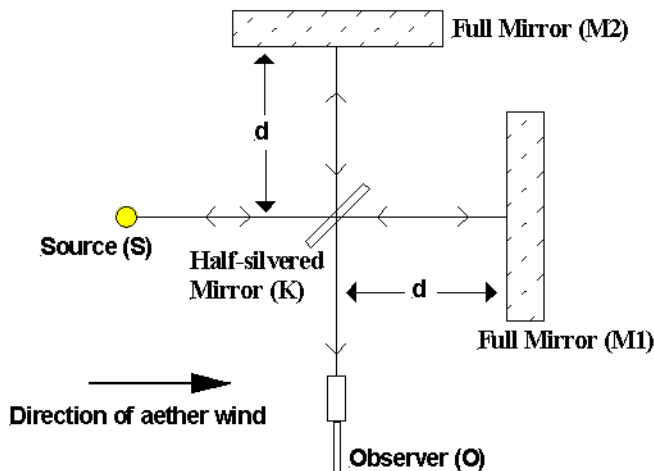
Below, find a more detailed explanation of Figure 3.7 from Michael Fowler, Department of Physics, University of Virginia:

1. The scheme of the experiment is as follows: a pulse of light is directed at an angle of 45 degrees at a half-silvered, half-transparent mirror, so that half the pulse goes on through the glass, half is reflected. They both go on to distant mirrors, which reflect them back to the half-silvered mirror. At this point, they are again half-reflected and half-transmitted, but a telescope is placed behind the half-silvered mirror as shown in the figure so that half of each half-pulse will arrive in this telescope. If there is an aether wind blowing, someone looking through the telescope should see the halves of the two half-pulses to arrive at slightly different times, since one would have gone more east–west and back, one more south–north and back. [The wave from east–west and back would travel a longer distance (time) than the wave from south–north and back]. To maximize the effect, the whole apparatus, including the distant mirrors, was placed on a large turntable so it could be swung around.

2. Michelson utilized a steady beam of light of a single color. This can be visualized as a sequence of ingoing waves, with a wavelength one fifty-thousandth of an inch or so. This sequence of waves is split into two and reflected back to the central receiving mirror (telescope eye where the interference pattern occurs). One set of waves goes northward and then southward (*a, b* then *b, a*). The other set of waves goes eastward and then westward (*a, c* then *c, a*). Finally, they come together into the telescope and the eye (*d*). If the one that took longer is half a wavelength behind, then its troughs will be on top of the crests of the first wave; thus, they will cancel, and nothing will be seen. If the delay is less than that, there will still be some dimming. However, slight errors in the placement of the mirrors would have the same effect. This is one reason why the apparatus is built to be rotated. On turning it through 90 degrees, then the north–south waves through the ether wind and the east–west waves through the ether wind will exchange places. The other one should be behind. Thus, if there is an ether wind and if you watch through the telescope while you rotate the turntable, you should expect to see variations in the brightness of the incoming light.

In addition, here is a second brief synopsis regarding the physics of the MMX found at the New South Wales Catholic Schools Physics Department website (Bob Emery):

In 1887, Albert Michelson and Edward Morley of the USA carried out a very careful experiment at the Case School of Applied Science in Cleveland. The aim of the experiment was to measure the motion of the Earth relative to the aether and thereby demonstrate that the ether existed. Their method involved using the phenomenon of the interference of light to detect small changes in the speed of light due to the Earth's motion through the aether.



Bob Emery

New South Wales Catholic Schools, Physics Department

Figure 3.8 MMX Apparatus [Fair Use]

The whole apparatus is mounted on a solid stone block for stability and is floated in a bath of mercury so that it could be rotated smoothly about a central axis. The Earth, together with the apparatus, is assumed to be traveling through the aether with a uniform velocity— u of about 30 km/s. This is equivalent to the Earth at rest with the aether streaming past it at a velocity— u .

In the experiment, a beam of light from the source S is split into two beams by a half-silvered mirror K as shown. One half of the beam travels from K to M1 and is then reflected back to K, while the other half is reflected from K to M2 and then reflected from M2 back to K. At K, part of the beam from M1 is reflected to the observer O and part of the beam from M2 is transmitted to O.

Although the mirrors M1 and M2 are the same distance from K, it is virtually impossible to have the distances traveled by each beam exactly equal, since the wavelength of light is so small compared with the dimensions of the apparatus. Thus, the two beams would arrive at O slightly out of phase and would produce an interference pattern at O.

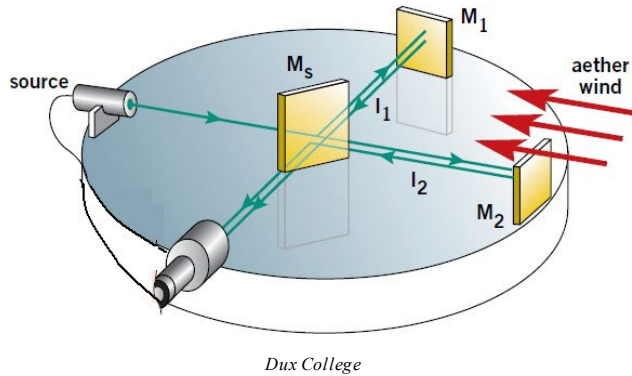
There is also a difference in the time taken by each beam to traverse the apparatus and arrive at O, since one beam travels across the aether stream direction while the other travels parallel and then anti-parallel to the aether stream direction. This difference in time taken for each beam to arrive at O would also introduce a phase difference and would thus influence the interference pattern.

If the apparatus were to be rotated through 90° , the phase difference due to the path difference of each beam would not change. However, as the direction of the light beams varied with the direction of flow of the aether, their relative velocities would alter and thus the difference in time required for each beam

to reach O would alter. This would result in a change in the interference pattern as the apparatus was rotated.

The Michelson–Morley apparatus was capable of detecting a phase change of as little as $1/100$ of a fringe. The expected phase change was $4/10$ of a fringe. However, no such change was observed.

Thus, the result of the Michelson–Morley experiment was that no motion of the Earth relative to the ether was detected. Since the experiment failed in its objective, the result is called a null result. The experiment has since been repeated many times, and the same null result has always been obtained.



Dux College

Figure 3.9 3D–MMX Apparatus [Fair Use]

Figure 3.9 is a three–dimensional reconstruction of Figure 3.7.

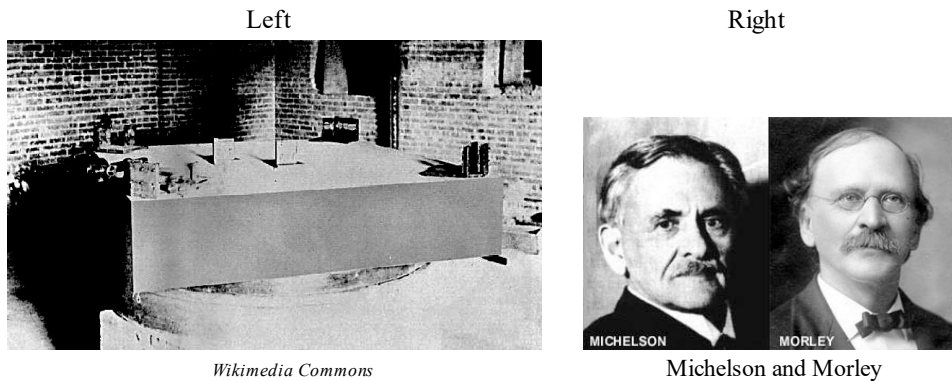


Figure 3.10 Photograph of MMX Apparatus [Fair Use]

* Perhaps it will be considerably easier for the novice to comprehend the following classic explanation of the MMX, written by the author, since it is designed specifically for that segment of the population. Even so, for the physicist, this description will help clarify the error of the classic interpretation, since one must comprehend how the MMX actually functions, before one can understand the flaw of the overlooked physics.

→First, assume the physical lengths of the arms of the MMX are absolutely equal. And second, presume that there is an ether wind. Therefore, the light, which travels within the

to-and-fro wind arm, takes a longer transit time when compared to the crosswind arm. It is assumed the to-and-fro transit time is longer, given that light (c) travels a greater distance through the ether because of the ether wind.

Take note that "time" is a direct function of distance "traveled through the ether." In turn, distance is a function of geometry. From here on out, regarding this chapter, geometry refers to the distance traveled through the ether, not distance relative to the physical length of the arms of the MMX. **Therefore, with reference to this concept, moreover, to avoid confusion, the word distance, as such, will be labeled in parentheses and with an asterisk; (distance*) = distance through the ether.**

The MMX does not directly measure the speed of light, for relative to each arm, any potential gain or loss of the speed of light traveling in one direction is compensated by a loss or gain in the opposite direction. As a result, the speed of light is not directly measured, rather only time (mathematically) as a function of (distance*). If the preferred frame for the speed of light is the ECF (gravitational field) as proven by the GPS system, then the maximum measured anisotropy possible is located at the equator at 1,000 mph.

The following figures 3.11, 3.12, 3.13, and 3.14 describe the classic explanation of the function of the MMX. They represent four different reference frames—again, →assume equal physical length of the arms←.

Figure 3.11 assumes there is no ether or else the MMX is at rest with the ether. With reference to this frame, it is as if the observer is standing adjacent to the MMX, moreover, with no discernment of the ether. Therefore, the illustration shows his/her perception of the pathways of the light beams with respect to the frame of the MMX.

Figure 3.12 posits a stationary ether. Pertinent to this frame, it is as if the observer is a part of the ether, moreover, observing the pathways of the two light beams traveling through the ether.

Figure 3.13 postulates an ether wind. With regard to this frame, it is as if the observer is standing next to the MMX with no awareness of the ether wind. As such, the illustration shows his/her perception of the pathways of the light beams relative to the frame of the MMX.

Figure 3.14 posits an ether wind. Applicable to this frame, it is as if the observer is stationary with respect to the ether wind, furthermore, observing the pathways of the two light beams traveling through and with the ether wind.

So to begin with, refer to figures 3.11 and 3.12 below and the following dialogues. Again, assume that the physical lengths of the arms of the MMX are absolutely equal and distance refers to distance through the ether, labeled (distance*).

Figures 3.11 and 3.12 presume there is no ether or else the MMX is at rest with the ether. In this setting, relative to the two arms, the (distances*) are equal. If so, then at the location of the detector (observer), the two light streams are in phase. Consequently, no interference pattern forms (no dimming), regardless of whether or not the MMX is rotating.

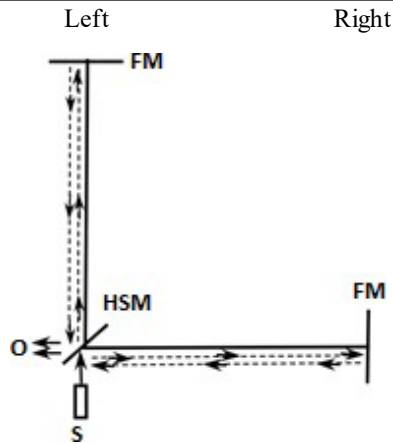


Figure 3.11 Two Paths of Light as Seen by the Observer

- *O* = Observer (detector).
- *S* = Source of light.
- *HSM* = half-silvered mirror.
- *FM* = Full mirror.
- Dotted lines with arrows = pathways of light beams.

Figure 3.11 above depicts the MMX in the absence of an ether or else at rest with the ether, moreover, from the reference frame of its own physical structure. The illustration shows the perceived pathways of the two light streams (denoted by the arrows) relative to an observer standing next to and observing the MMX.

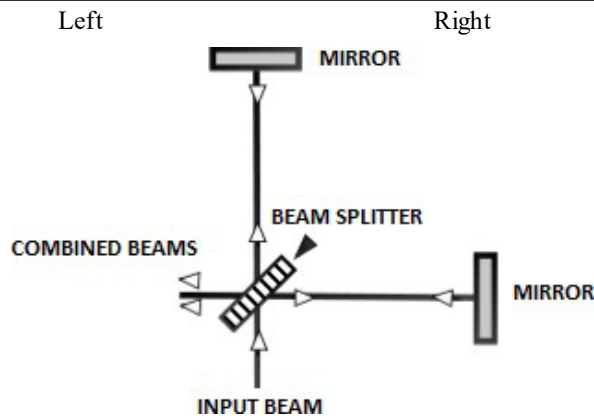


Figure 3.12 No Interference Pattern = at Rest with the Ether or no Ether [Fair Use]

Figure 3.12 above depicts the MMX at rest with the ether, moreover, from the reference frame of the ether. The illustration shows the pathways of the two light streams, depicted by the arrows, as they traverse through the ether. In this scenario, the vertical arm (distance) equals the horizontal arm (distance*). Therefore, no interference pattern forms, with or without rotation.*

See figures 3.13 and 3.14 below and the following discussions. Alternatively, if the ether wind exists, then the "interval of time" (distance*) that it takes for light to travel within the to-and-fro arm is greater than the cross-wind arm. This divergence produces an interference pattern at the location of the observer/detector (see Figure 3.15 left). Subsequently, during 360 degrees of rotation, then relative to the two arms, the (distances*) change.

Essentially, they exchange places every 90 degrees. As a result, over 360 degrees of rotation, there is a continuous alteration in the appearance of the interference pattern (alternating brightness and dimming). This takes the form of a fringe shift with a sinusoidal wave pattern. See also Figure 3.15 (left to the right), as well as Figure 3.16.

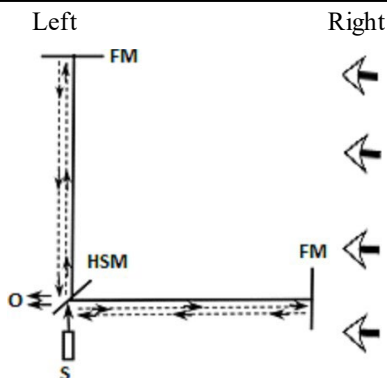


Figure 3.13 MMX with Ether Wind

Figure 3.13 above shows the MMX from the reference frame of its own physical structure but now in the presence of an ether wind. Assume the MMX possesses a translational velocity relative to the ECF/EGF, from left to right.

Therefore, the relative ether wind is oriented in the opposite direction, from right to left (arrows on the right). The schematic demonstrates the perceived pathways of two light streams from the reference frame of an observer standing next to and observing the physical structure of MMX with no awareness of the ether wind.

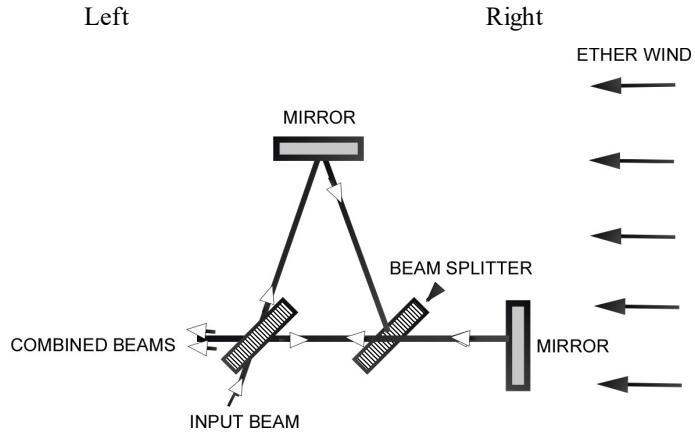
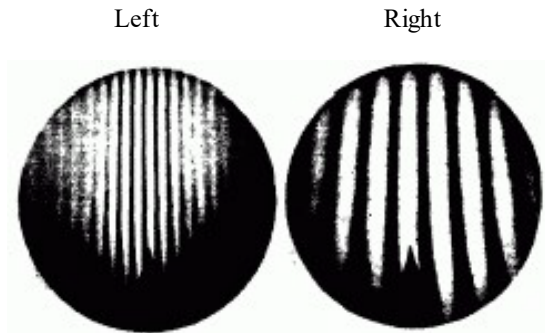


Figure 3.14 MMX with Ether Wind [Fair Use]

Figure 3.14 depicts the pathways of the two light streams as they traverse through and with the relative ether wind, moreover, from the reference frame of an observer stationary with respect to that ether wind. In this instance, the to-and-fro arm time (distance*) is > than "the cross-wind" time (distance*).

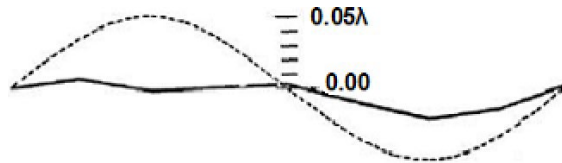
Therefore, an interference pattern forms at the location detector/observer. In addition, as a function of rotation (360 degrees), there is then a fringe shift produced in the form of sinusoidal wave pattern. See figures 3.15 and 3.16 below.



Wikipedia

Figure 3.15 Interference Pattern [Fair Use]

From left to right, the interference pattern changes which is called a fringe shift.



Wikipedia

Figure 3.16 Graph of the Sinusoidal Pattern of the Fringe Shift [Fair Use]

The graph is from the original MMX experiment paper. The expected change in the appearance of the interference pattern (fringe shift), during 360 degrees of rotation, takes on the form of a sinusoidal wave pattern as depicted above by the more pronounced dotted curved line.

The author proposes both an alternative hypothesis and alternative postulate. The hypothesis is given below, and the postulate is an epilogue. Note: The postulate, which in all probability is most likely the correct idea, is easier to understand after comprehending the hypothesis. Please evaluate both, especially the postulate.

The major concept for appreciating the overlooked physics of the MMX is this. The interference pattern is not formed at the detector (observer). Rather, it is initially formed at the location of the half-silvered mirror. This is where the two returning/reflected, moreover, opposing light waves first interface/intersect, and then interact at right angles to form the interference pattern. Subsequently, after this recombination at the half-silvered mirror, they are then fixed relative to one another. And once fixed, they travel parallel, moreover, in the identical direction, through the same ether to the detector (observer), even during rotation. See Figure 3.17 and the following discussion.

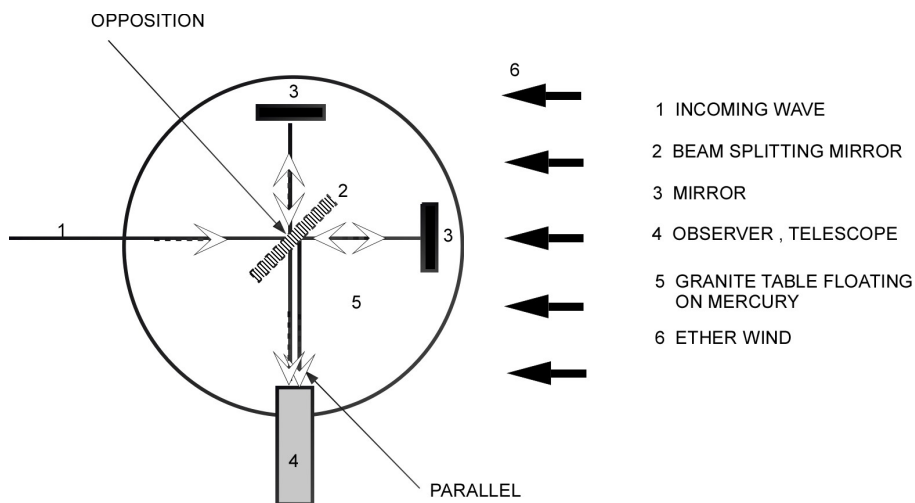


Figure 3.17 MMX with an Ether Wind [Fair Use]

- Assume equal physical length of the arms.
- Presume an ether wind portrayed by the horizontal solid arrows on the right.
- As opposed to the prior illustrations, the source and observer have exchanged places. This has no effect on the outcome.

Incorrect interpretation. (Classic Theory)

The observer located at the detector (telescope) falsely assumes, with respect to the two arms, that the two light waves are traveling \rightarrow parallel \leftarrow to one another their entire (distances*)(time). Observe, in actuality, they are not always physically in all segments traveling parallel their entire (distances*). However, mathematically expressed as a function of time with respect to the MMX equations, they are functionally parallel. In addition, he/she also incorrectly presumes the interference pattern forms at the position of the detector (observer).

Given these false postulates, then during rotation, the two light waves (distances*)(time) essentially exchange places every 90 degrees. This function is \rightarrow only somewhat analogous \leftarrow to two vertical metal grates shifting back and forth for every 90 degrees, with the grates representing light wavelengths. Therefore, presuming an ether wind, this assumed effect, over 360 degrees of rotation, produces a fringe shift (presenting as an alternating dimming and brightness) in the form of a sinusoidal wave pattern.

Correct proposed interpretation. (Hypothesis)

However, in fact, the interference pattern actually forms as a function of two returning light waves, which have already been reflected from the peripheral mirrors to the half-silvered mirror. Therefore, from the frame of the half-silvered mirror, they are then traveling in physical \rightarrow opposition \leftarrow to one another (right angle).

The half-silvered mirror is the location where the interference first forms. So during rotation, from the frame of the half-silvered mirror, one arm progressively gains (x) wavelengths, while the other arm **symmetrically** and progressively loses (x) wavelengths. Consequently, the configuration of the two opposing interacting wavefronts at their interface (half-silvered mirror) does not change, even though the (distances*) have changed. This process reverses itself every 90 degrees.

Then, from the half-silvered mirror to the detector (observer), the two waves travel parallel, moreover, are fixed relative to one another, even during rotation. This is because at that interval of time, both waves are traveling physically parallel through the same ether. Therefore, overall, during rotation, there is no fringe shift even in the presence of an ether wind.

The most important facts to acknowledge are:

1. The interference pattern is observed at the detector, but not formed there. It is \rightarrow initially \leftarrow formed at the location of the half-silvered mirror.
2. The interference pattern is fashioned from two opposing waves, which have already been reflected from the peripheral full mirrors to the central half-silvered mirror. So, from the reference frame of the half-silvered mirror, they are physically traveling in opposition towards one another (right angle).
3. For reinforcement, the interference pattern is not a function of two interacting parallel waves traveling in the same direction their entire (distances*), though the definition of parallel is only expressed mathematically as a function of time with respect to the equations of the MMX. Rather, as above, it is a function of two physical interacting waves traveling in physical opposition at the location of the half-silvered mirror.

At this juncture, before proceeding, it would be highly helpful if one viewed figures 3.25 and 3.27. These illustrations demonstrate, that at 45 degrees, relative to the ether wind, the (distances*) within the two arms are exactly the same. This is assuming equal physical lengths of the arms. Knowing and accepting this fact/assumption is a crucial step in order to understand the following explanation and descriptions.

See figures 3.18, 3.19, 3.20, and 3.21, and assume all is oriented as shown. Here again are the crucial concepts and descriptions regarding the overlooked physics of the MMX. This first description is of the classical, nevertheless erroneous interpretation.

Incorrect interpretation. (Classic Theory)

Once again, presume an ether wind and equal physical lengths of the arms as depicted. In this instance, relative to the two arms, the intervals of time (distances*) are unequal. Consequently, at the position of the detector or observer, where it is posited that the →parallel← light beams recombine, an interference pattern then forms. Take note again, in actuality, the two light beams are not physically traveling parallel their entire (distances*). Parallel in this instance is a mathematical function of time with respect to the equations of the MMX.

In addition, as a function of rotation resulting in a gain of an interval of time (distance*) in one arm vs. loss of an interval of time (distance*) in the other arm, then over 360 degrees, a fringe shift is produced in the form of a sinusoidal wave. This fringe shift is depicted below in Figure 3.19.

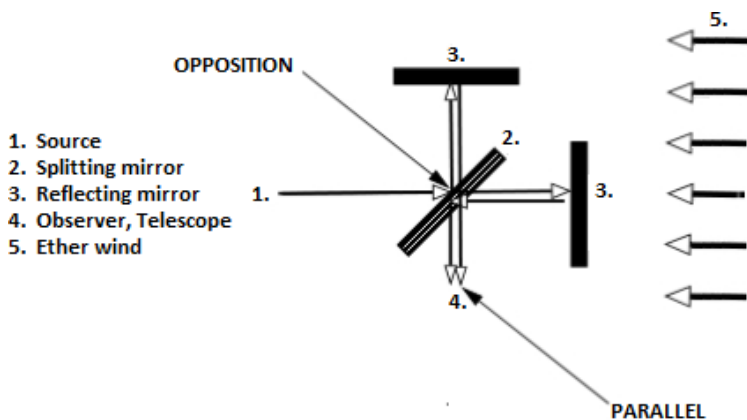
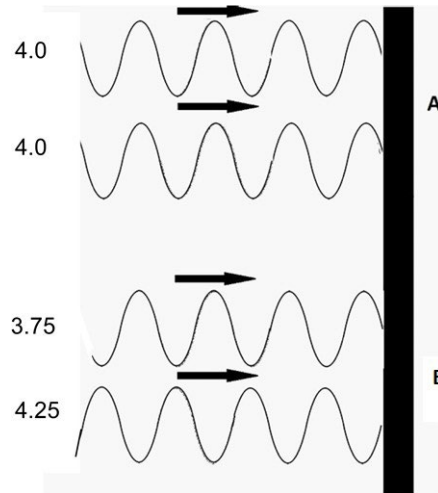


Figure 3.18 MMX with an Ether Wind

- *M1 and M2 = peripheral full mirrors.*
- *K = half-silvered mirror.*
- *Arrows within MMX = direction of light waves.*
- *Rows of hollow arrows to the right = ether wind.*

For reinforcement, the incorrect interpretation is again presented referring to figures 3.18 and 3.19.

Parallel Interacting Waves (Incorrect)**Figure 3.19** Incorrect Interpretation (Classic Theory)

There is a fringe shift between A and B.

- The classical explanation assumes the interference pattern forms at the detector.
- Assume an ether wind with equal physical lengths of the arms.
- (Distance*) = distance of the light through the ether = interval of time.
- The straight vertical bar represents the detector or observer.
- The two sets of waves represent the (distance*) (time) within each of the two arms. A = one set. B = the second set.
 - A = The arms are oriented 45 degrees relative to the ether wind.
 - B = The arms are oriented at either 0 or 90 degrees relative to the ether wind.
 - Take note, relative to 45 degrees vs (0 degrees or 90 degrees), there is anti-symmetry (gain vs loss) of the number of wavelengths. However, for simplicity of explanation, only one symmetry is shown in this figure.
 - At the location of the detector, it is assumed the two waves travel mathematically (time) →parallel← to each other their entire (distances*).
 - Note the illustration depicts parallel waves but only as a representation of time with respect to the equations of the MMX.

The following is once again the classic, but erroneous, interpretation of the function of the MMX. The assumptions presented are false; therefore, the physics described below is incorrect. Refer to Figure 3.19.

Position A = 45 degrees relative to the ether wind.

At this position, with respect to the two arms, the "interval of time" (distances*) are equal. Therefore, at the location of the detector (observer), the two light waves are in phase. As a result, no interference pattern forms (no dimming).

Position B = 0 or 90 degrees with respect to the ether wind.

At these positions, after rotation from 45 degrees, relative to the two arms, the (distances*) are unequal. In this setting, the two waves are now out of phase, because during this rotation,

one arm gains 0.25-wavelength(s) (distance*) (time) (A top), while the other arm symmetrically loses 0.25-wavelength(s) (distance*) (time) (B bottom). So, at the location of the detector (observer), an interference pattern forms. This process then reverses itself every 90 degrees. Therefore, as a function of 360 degrees of rotation, a fringe shift is produced in the form of a sinusoidal wave pattern (alternating dimming and brightness).

- Bear in mind that the gain versus loss of wavelength between 45 compared 0 and 90 degrees is not numerically equal, as shown in the figure above, but rather unequal. However, for simplicity of visual appreciation presented as equal (gain vs. loss). This alteration does not change the underlying principle as illustrated. The reason will be clarified/explained in the epilogue imparted later in this chapter. The author believes the postulate (anti- asymmetry) of the epilogue (not the theory/hypothesis) is probably the correct concept. Nevertheless, this assumption requires vigorous mathematical proof beyond the capability of the author. See Page 106 C.

Correct proposed interpretation. (Hypothesis)

Before proceeding, please see figures 3.20 and 3.21.

Again, assume an ether wind with absolutely equal physical length of its arms. And all is oriented as shown.

In reality, the two streams of light waves, after being reflected from the peripheral full mirrors, are then physically traveling towards one another in →opposition← at a right angle. Their wavefronts initially intersect, moreover, interact, at the half-silvered mirror to form the interference pattern. Then, from the half-silvered mirror to the detector, they are fixed physically parallel relative to one another, even during rotation.

Assume there is rotation of the MXX. If the two light waves are traveling in →opposition← (Figure 3.21) and if one wave progressively gains (x) number of wavelengths (distance*), whereas the other wave symmetrically progressively loses an equal (x) number of wavelengths (distance*), then at the true location of the interacting wavefronts (half-silvered mirror), there is no change in their interface. For the same reason, during rotation, there is no fringe shift (dimming), since this anti-symmetrical compensatory function prevents it.

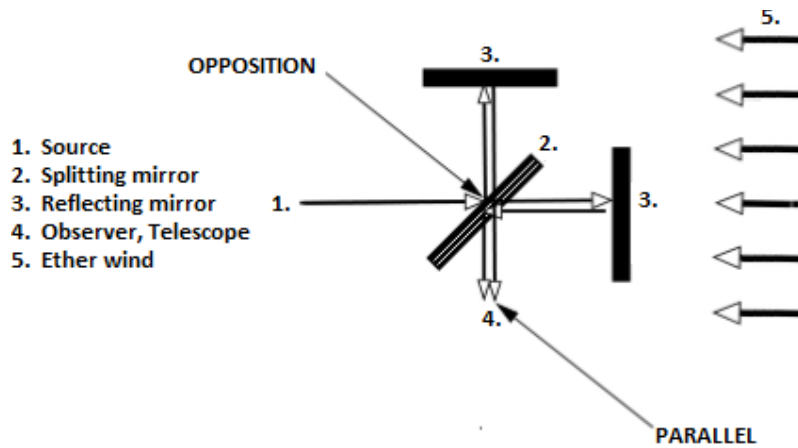


Figure 3.20 MMX with an Ether Wind

- S = light source.
- $M1 M2$ = peripheral full mirrors.
- K = half-silvered mirror.
- Arrows within MMX = direction of light waves.
- Line of arrows to the right = ether wind.

Yet again for reinforcement, the correct interpretation (proposed hypothesis) is presented now referring to Figure 3.21 below. The assumptions presented are assumed to be true. Therefore, the physics described below is only presumed to be correct.

Opposition Interacting Waves (Correct)

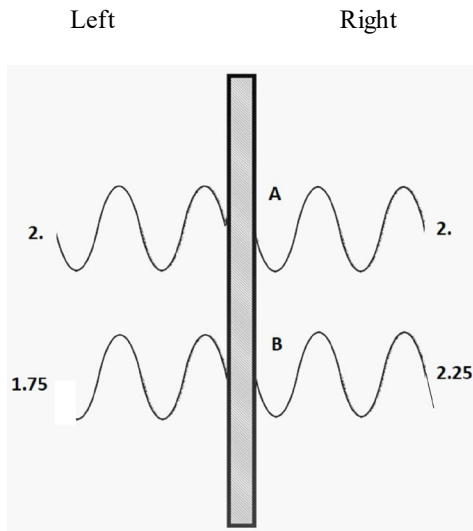


Figure 3.21 MMX with an Ether Wind – correct proposed interpretation (hypothesis)

There is no fringe shift between A and B.

- Assume an ether wind and equal physical length of the arms.
- (Distance*) = distance of the light through the ether.
- The straight vertical bar now represents the half-silvered mirror.
- The two sets of waves (left and right) represent the (distance*) (time) within each of the two arms.
- At the location of the half-silvered mirror, the two returning waves are traveling in \rightarrow opposition \leftarrow relative to one another (actually at a right angle).
- A = The arms are oriented 45 degrees relative to the ether wind.
- B = The arms are orientated 0 or 90 degrees relative to the ether wind.
- Observe relative to 45 degrees vs. (0 degrees or 90 degrees), there is anti-symmetry (gain vs loss) of the number of wavelengths. Nevertheless, for simplicity of explanation, only one of the two anti-symmetries is shown in this figure.
 - The correct explanation assumes the interference pattern forms at the location of the half-silvered mirror as a function of two opposing waves.
 - The \rightarrow opposing \leftarrow waves, as shown above, are a function of the two light waves traveling to their respective peripheral mirrors and then both reflected back to the half-silvered mirror where the interference pattern then forms. However, with respect to this illustration, only the reflective returning segments are shown.

Position A = 45 degrees relative to the ether wind.

At this position, relative to the two arms, the (distances*) are equal. Consequently, at the location of the half-silvered mirror, the two light waves are in phase. As a result, no interference pattern forms.

Position B = 0 or 90 degrees with respect to the ether wind.

At these positions, after rotation from 45 degrees, then relative to the two arms, the (distances*) are unequal. In this scenario, during this rotation, one arm gains 0.25-wavelength (distance*), on the right side, while the other arm \rightarrow symmetrically \leftarrow loses an equal 0.25-wavelength (distance*) on the left side.

As a result of this \rightarrow opposing anti-symmetry \leftarrow , at the location of the half-silvered mirror, where the two returning, moreover, opposing light beams, first interact (right angle), the interface of the two waves does not change, **even though the (distances*) have changed**. Therefore, they remain in phase. This same function then reverses itself in 90-degree segments, throughout 360 degrees of rotation.

In addition, from the half-silvered mirror to the detector (observer) the two interacting waves then travel physically parallel in the same direction to the detector (observer). Furthermore, they remain fixed with respect to one another, with or without rotation. This is because at that time, they are both traveling parallel through the same ether (distance*).

So given all of the above, then during rotation, no fringe shift is produced, even in the presence of an ether wind. However, in the real world, the physical lengths of the arms are not absolutely equal relative to a single wavelength of light. So, in reality, at 45 degrees, an interference pattern forms, but only as a function of the unequal physical length of the two arms. Then, during rotation the anti-symmetrical compensatory process just described prevents a fringe shift.

In summary:

- If the two streams of light waves are initially out of phase, related to only the ether wind, then during rotation, the anti-symmetrical compensatory function just described prevents a change in the interface. As a result, during rotation, there is no fringe shift.

- If the two light waves are out of phase, in this case, only as a function of unequal physical length of the arms, then again, there is no fringe shift during rotation.
 - Assuming there is no ether, once again as a function of rotation, there is no fringe shift.
- For all these reasons, the MMX is silent as to whether or not the ether exists. In summary, The MMX is incapable of detecting the ether wind. Voila! There you have it.

This concept is not easily visualized. For if it were, then it would not have been so easily overlooked. For that reason, a more detailed explanation is now provided as offered below in Figure 3.22 and the following dissertations.

Essentially, this re-explanation is not for the physicist, but for the benefit of the novice, the target population of this publication. Carefully, follow the pathways of the two light beams with respect to Figure 3.22, which are described in the following paragraphs.

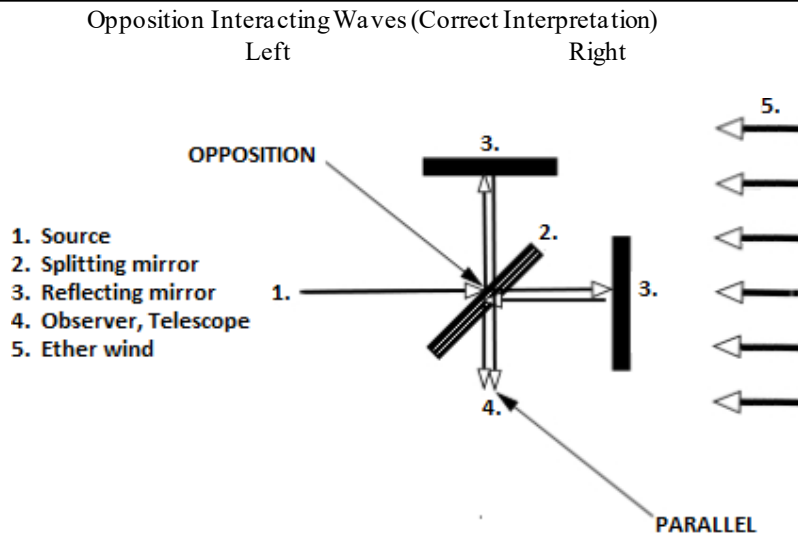


Figure 3.22 MMX with an Ether Wind

A single beam of light is emitted from the source (1). This light beam is then divided into two separate streams by the half-silvered mirror (2). They then travel to the peripheral full mirrors (3). Subsequently, the full mirrors then reflect the beams back to the half-silvered mirror.

Here is the crucial point. When the returning reflected light beams first intersect, then interact (interface), at the half-silvered mirror, moreover, at a right angle, this is where the interference pattern is first formed. This interaction is a function of two light beams traveling in physical →opposition←—not mathematically →parallel← as a function of time. So, from the reference frame of the half-silvered mirror and during rotation, as one light beam progressively gains wavelengths (distance*), while the other beam →symmetrically← progressively loses an equal number of wavelengths (distance*), then the interface of the two waves remains unchanged.

This means the interference pattern also remains unaffected. In essence, during rotation, the (distances*) change, but the interference pattern does not.

Then, from the half-silvered mirror to the detector (observer) the two beams physically travel parallel in the same direction. Moreover, they are fixed relative to one another, since at this time, they both are traveling through the same ether (distance*).

Given all of the above, then as a function of the rotation (MMX), even in the face of the ether wind, there is no fringe shift.

The next two illustrations and their captions more accurately depict the classical, although incorrect, interpretation of the MMX (Figure 3.23) versus the correct interpretation (Figure 3.24). Figure 3.24 is a more precise description compared to Figure 3.21; since the opposing wavefronts interact at a right angle relative to one another. Basically, it is easier to understand Figure 3.24 (90-degree opposition) after comprehending Figure 3.21 (180-degree opposition). This is rational for the re-explanation.

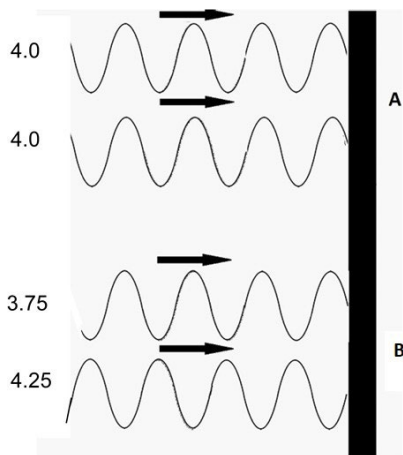


Figure 3.23 Incorrect Interpretation (Classic Theory)

Parallel (time) interacting light waves (incorrect interpretation)

There is a fringe shift between A and B.

- Assume an ether wind with equal physical length of arms.
- (Distance*) = distance of light through the ether = interval of time.
- The straight vertical bar represents the detector or observer.
- A top: 45 degrees relative to the ether wind.
- B bottom: 0–90 degrees relative to the ether wind.
- Again, relative to 45 degrees vs (0 degrees or 90 degrees), there is anti-symmetry (gain vs loss) of the number of wavelengths. However, for simplicity of explanation, only one of two anti-symmetries is shown in this figure.
- Take note again: the gain versus loss of wavelength between 45 degrees compared to 0 and 90 degrees is not numerically equal as shown above but rather unequal, however, for simplicity of visual appreciation, presented as equal (gain vs. loss). This alteration does not change the underlying principle as posited.

Figure 3.23 above is the incorrect interpretation of the function of the MMX (theory). The assumptions presented are false. Therefore, the physics described below is then incorrect.

Classically, it is assumed, relative to the two arms, that the interference pattern is formed at the detector (observer) as a function of two interacting \rightarrow parallel \leftarrow waves, traveling in the same direction their entire (distances*), **however, parallel only expressed mathematically as a function of time in the MMX equations.**

Position A (45 degrees). At this position, the two light waves are in-phase, since with respect to the two arms the "intervals of time" (distances*) are equal.

Position B. However, after rotation from 45 degrees, at 0 or 90 degrees (B), they are out of phase, since in this setting, relative to the two arms, the time intervals (distances*) are unequal. Therefore, an interference pattern forms. This is because during rotation, one wave gains an interval of time (distance*), while the other wave loses an interval of time (distance*).

This process then reverses itself every 90 degrees. Consequently, over 360 degrees of rotation, at the location of the detector, a fringe shift is produced in the form of a sinusoid. All of this is assuming, relative to the two arms, that the two light waves are traveling →parallel← (expressed as time in the MMX equations) in the same direction their entire (distances*), moreover, then recombine at the location of the detector (observer), both assumptions of which are incorrect.

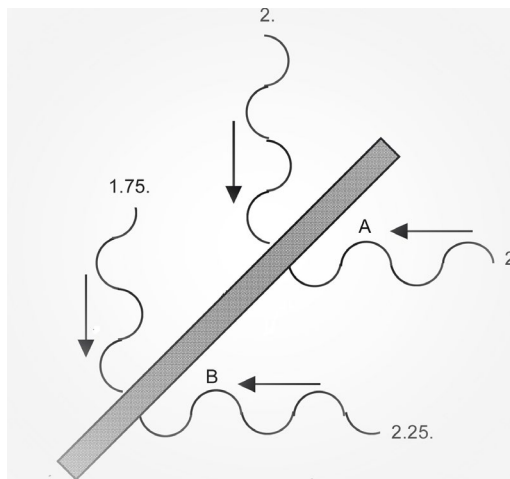


Figure 3.24 Correct Proposed Interpretation (Hypothesis)

Opposing interacting light waves (correct interpretation)

There is no fringe shift between A and B.

- Assume an ether wind with equal physical lengths of the arms.
- Slanted rectangular gray bar is the half-silvered mirror.
- (Distance*) = distance of the light through the ether.
- Top A = 45 degrees relative to the ether wind. The two waves (vertical and horizontal) are in phase at the half-silvered splitting mirror with equal (distances*) in both arms.
 - Bottom B = 0 or 90 degrees relative to the ether wind. The vertical wave loses a quarter of a wavelength, and the horizontal wave gains a quarter of a wavelength. Therefore, at the half-silvered mirror, the two waves are still in phase even though the (distances*) in the two arms have changed.
 - Yet again, relative to 45 degrees vs (0 degrees or 90 degrees), there is anti-symmetry (gain vs loss) of the number of wavelengths. Nonetheless, for simplicity of explanation, only one of two anti-symmetries is shown in this figure.
- The →opposing← waves, as shown above, are a function of the two light waves traveling to their respective peripheral mirrors and then both reflected back to the half-silvered mirror where the interference pattern then forms. However, with respect to this illustration only, the reflective returning segments are shown.

Figure 3.24 above is the correct proposed interpretation of the function of the MMX (hypothesis). Take note, the assumptions presented are assumed to be true; therefore, the physics described below is only presumed to be correct.

In reality, the interference pattern is formed where the two returning opposing wavefronts first intersect, which is at the location of the half-silvered mirror (slanted dotted bar). These right-angled intersecting waves are traveling in **physical opposition not parallel** (time in the MMX equations). So, during rotation (top to bottom), one light wave gains 0.25-wavelength (distance*) while the other wave symmetrically loses 0.25-wavelength (distance*). As a result, the configuration of the two interacting wavefronts at the location of the half-silvered mirror remains unchanged. In essence, during rotation, the (distances*) change, but the interface of the two opposing waves does not. So, if the interface does not change, then neither does the interference pattern; therefore, there is no fringe shift. Additionally, from the half-silvered mirror to the detector (observer), the two waves travel physically parallel in the same direction, moreover, are fixed relative to one another, because at that time, both waves travel through the same ether (distance*). Overall, relative to the detector (observer), during rotation, no fringe shift is again observed.

In the real world, the physical lengths of the arms of the MMX are not absolutely equal relative to a single wavelength of light. So, in actuality, at 45 degrees an interference pattern forms but only as a function of the unequal physical length of the arms. Then, during rotation, the anti-symmetrical compensatory process just described prevents a fringe shift.

Once again for the novice, figures 3.25, 3.26, 3.27, and, 3.28 below demonstrate, in the presence of an ether wind, that during the rotation of the MMX, due to the **opposing anti-symmetrical compensatory function** just described, where a gain of the number of wavelengths (distance*) in one arm is associated with an equal loss of a number of wavelengths (distance*) in the other arm, no fringe shift is produced.

Notice, at 45 degrees, the (distances*) within both arms are the same, assuming equal physical lengths of the two arms. This explains position A in the previous illustrations. But remember in the real world, the physical lengths of the arms are unequal when compared to a single wavelength of light. As a result, in truth, at this position (45 degrees), the (distances*) are unequal, although only as a function of the different physical lengths of the arms. The underlying rationale for why the author chose to assume equal physical length of the arms is for simplicity of explanation.

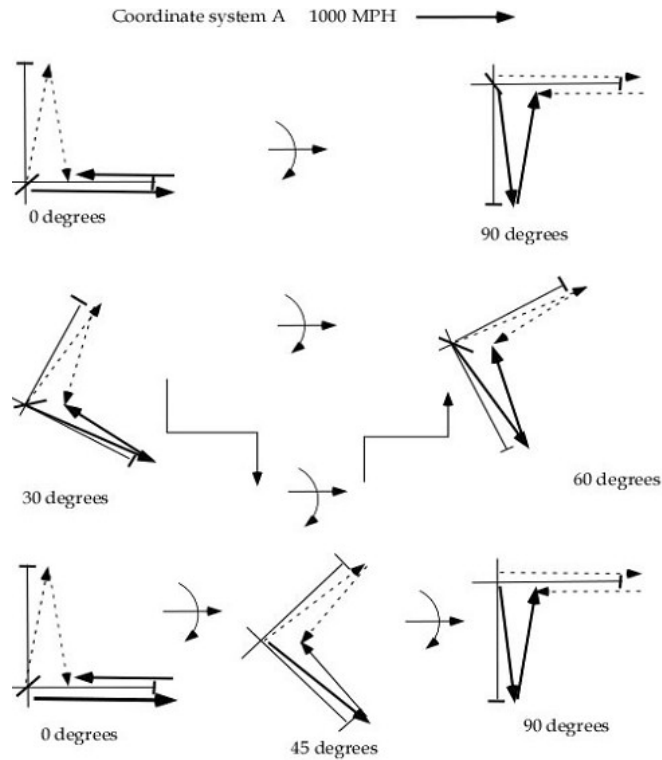


Figure 3.25 **Opposing** Interacting Light Waves (Correct Interpretation)

Assume an ether wind 1,000 mph from right to left. Presume equal physical length of the arms. So at 45 degrees, the (distances*) within both arms are then equal.

Observe during rotation of 90 degrees (from 0 to 90 degrees).

- The dotted (distance*) exchanges places with the solid (distance*).
- Or the total number of wavelengths within the dotted arm exchanges places with the total number of wavelengths within the solid arm.
- Or the gain in the number of wavelengths within the dotted arm is symmetrical with the loss in the number of wavelengths within the solid arm.
- The →opposing← anti-symmetry function of number of wavelengths then produces, during rotation at the location of the half-silvered mirror, a stable interference pattern, regardless of whether or not there is an ether wind.

One more time for the novice, this compensatory anti-symmetrical function is once again shown below in figures 3.26, 3.27, and 3.28 but now with even more clarity.

Notice: The (distances*) relative to both arms change; nevertheless, the interface still remains constant. As a result, there is no fringe shift during rotation.

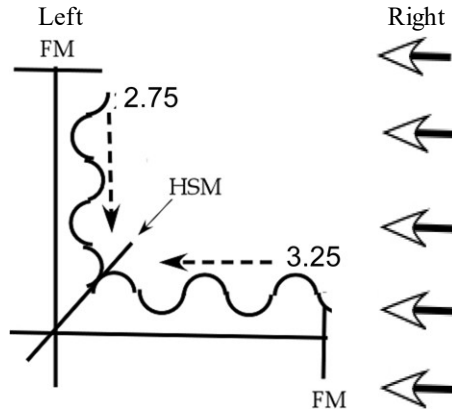


Figure 3.26 Opposing Interacting Waves
0 degrees relative to the ether wind symmetrical with figure

- *Hollow arrows = ether wind.*
- *HSM = half-silvered mirror.*
- *0 degrees relative to the ether wind.*
- *MMX is rotating clockwise—assume equal, physical length of arms.*
- *The (distance*) with respect to the to-and-fro arm is greater than the cross-wind arm.*
- *Notice, at 0 degrees the two light beams at the interface (half-silvered mirror) are in phase. Essentially, at 0 degrees, assuming an ether wind and presuming equal physical lengths of the arms, the wavefronts at the half-silvered mirror are always in phase regardless of the angle of rotation. See explanation after Figure 3.28.*
- *The opposing waves shown are a function of the two light waves traveling to their respective peripheral mirrors and then both reflected back to the half-silvered mirror where the interference pattern then forms. However, with respect to the above illustration, only the reflective returning segments are shown.*

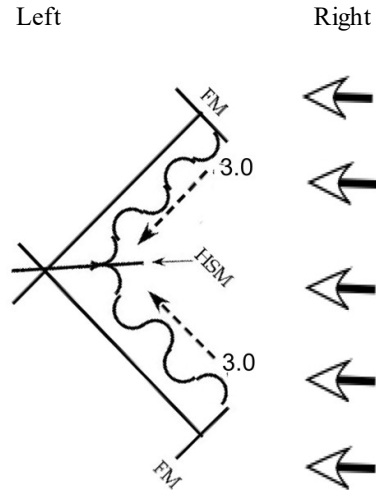


Figure 3.27 Opposing Interacting Waves
45 degrees relative to the ether wind

The (distances*) within each arm are now equal to each other. Nevertheless, the two light beams at the interface, (half-silvered mirror) are still in-phase. This is a function of a gain of 0.25 wavelength in one arm and a symmetrical loss of 0.25 wavelength in the other arm. There is no fringe shift.

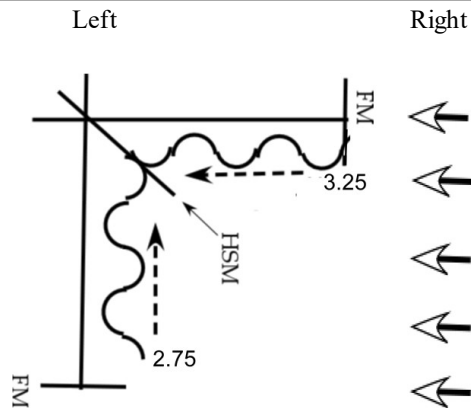


Figure 3.28 Opposing Interacting Waves
90 degrees relative to the ether wind

- The (distance*) with respect to the to-and-fro arm is greater than the cross-wind arm. But now when compared to 0 degrees, the two arms have changed places. The two light beams at the interface (half-silvered mirror) are still in-phase. Again, this is a function of a gain of 0.25 wavelength in one arm and a symmetrical loss of 0.25 wavelength in the other arm.

- Therefore, even though, as a function of rotation, the (distances*) change, the interface does not. And, if the interface does not change, then neither does the interference pattern. For that reason, there is

no fringe shift during rotation. In essence, even in the presence of an ether wind, the MMX is silent as to whether or not it exists.

Observe Figure 3.27. One can readily visualize at 45 degrees that the (distances*) with respect to both arms are identical, assuming equal physical lengths of the arms. Therefore, in this case, at the location of the half-silvered mirror, the two light waves are in-phase, so no interference pattern forms (no dimming).

However, it is somewhat more difficult to visualize at 0 and 90 degrees (figures 3.26 and 3.28) how, during rotation, counteracting **anti-symmetry** of opposing wavefronts in the two arms at the location of half-silvered mirrors, prevents any change in those in-phase opposing wavefronts, even though the (distances*) have changed. Again, there is no dimming (fringe shift) even during rotation.

What all this indicates is that if the physical lengths of the two arms are absolutely equal, there is no interference pattern independent of rotation (no dimming). The interference pattern (when present) is only/purely a function of unequal physical length of the two arms, relative to the distance of a single wave of light (wavelength) that is used, essentially a non-apparent Kennedy Thorndike interferometer.

Alternately, presuming an unequal physical-length arm scenario, at 45 degrees, there is now an interference pattern. Moreover, once more during rotation, because of the anti-symmetrical counteracting function as already described, then, at the location of half-silvered mirror, there is no change in this interference pattern.

Overall, as a result, the MMX is incapable of detecting the ether wind.

Again, the interference pattern is only a function of unequal length of the physical arms relative to a single wavelength of light used, moreover, not related to the ether wind. Observe all that depicted above is based on the assumption of counteracting opposing **anti-symmetrical (hypothesis)** changes in wavefronts (distances*) from the frame of the half-silvered mirror. →**But what happens if the opposing wavefronts are anti-asymmetric (postulate)?**← For that answer see the following epilogue regarding anti-asymmetry vs. anti-symmetry after the summary.

Summary

The classic interpretation of the MMX perceives the experiment from the reference frame of the detector (observer) as a function of the "amount of time" it takes for light to travel through the ether, relative to each arm. This interval of time is then mathematically correlated to the (distances*), involving two →parallel light beams←, traveling with reference to both arms in the same direction. In actuality, they are not traveling parallel their entire (distances*), but mathematically expressed as a function of time with respect to the MMX equations, they are.

The incorrect interpretation is related to the following.

1. Relative to each arm "time" is a function of (distance*) (true). However, the (distances*) could be traveling mathematically (time) parallel (false) or in physical opposition (true).
2. The origin of the interference pattern is located at the detector (observer) (false).
3. This is at the location where the two interacting waves travel physically parallel with respect to each other (true).
4. The origin of the interference pattern first forms at the half-silvered mirror (true). This is the location where the two waves travel in physical opposition with respect to each other (true).
5. During rotation, the two parallel waves (mathematical time), shift back and forth relative to one another, therefore, producing a fringe shift at the location of the detector (false).
6. During rotation, at the location of the half-silvered mirror, the interface of the opposing light waves remains fixed as a function of counteracting anti-symmetry (true).

The correct interpretation (hypothesis) perceives the MMX outcome from the reference frame of the half-silvered mirror. Therefore, relative to each arm, during rotation, as a function of two opposing, moreover, anti-symmetrical counteracting wavefronts the (distances*) change; however, the interface remains constant. Consequently, as a function of rotation, no change of the interference pattern occurs. In other words, during rotation, there is no fringe shift even in the presence of an ether wind.

There is one further consideration the author wishes to make, and it is this: The misconception with regard to the classical interpretation of the MXX belies the fact that the focus was on the mathematics of "time" as a function of (distance*). But time did not distinguish as to whether the two (distances*) are traveling parallel or in opposition.

And so, for that reason, the true visual function of the experiment was then overlooked. To somewhat paraphrase Maxwell, who believed in the ether, the main focus of physics should always relate to the true function not the math.

In conclusion, given the new hypotheses, moreover, derived conclusions as just presented, the null result of the MMX as originally preformed/interpreted does not invalidate Einstein's relativity but is silent. On the other hand, it (relativity) collapses if this alternative MMX mode is verified. See Epilogue.

As a result, by default, this leaves only the global observations and experiments, which represent true reality, whereby the speed of light is related to the gravitational field (inflow of the ether).

→Epilogue (The Postulate) = In all likelihood, the correct concept←.

The author is absolutely convinced that the interference pattern of the MMX is initially formed at the location of the half-silvered mirror and not from the frame of the telescope. It is observed at the telescope but not formed there. Nevertheless, the author does not possess the mathematical skill/knowledge to prove (rigorous mathematics) whether or not counteracting changes of the returning opposing wavefronts (distances*) from the frame of the half-silvered mirror are anti-symmetrical (hypothesis) or alternatively anti-asymmetrical (postulate). Consequently this novel theory, as just presented, is unproven.

In other words, regarding this alternative MMX hypothesis, all that was presented previously in Chapter 3 is totally dependent on the assumption of counteracting opposing **anti-symmetrical** changes of wavelength (distances*) from the frame of the half-silvered mirror; therefore, during rotation, there is no interference pattern and no fringe shift.

On the other hand, what occurs if the counteracting opposing wavelength changes (distances*) from the frame of the half-silvered mirror are **anti-asymmetric instead of anti-symmetric**? In this instance, during rotation, there would now be a fringe shift. However, it would be of a lesser magnitude compared to the parallel wave theory (classic interpretation/explanation).

For further clarification, see the comparisons below and assume equal physical length of the arms, as well as an ether wind.

A. Incorrect →classic/standard parallel wave theory← from the frame of the observer/telescope.

At 45 degrees relative to the ether wind, the two waves are in phase. Now, during rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*) and the other arm progressively loses wavelengths (distance*). The supposed fringe shift would be a function of the **sum of these two functions**.

B. Proposed correct original →opposing counteracting anti-symmetrical wave hypothesis← from the frame of the half-silvered mirror.

At 45 degrees relative to the ether wind, the two waves are in phase. Now, during rotation to 0 or 90 degrees, one arm progressively gains x wavelengths (distance*) and the other arm progressively **symmetrically** loses x wavelengths (distance*). In this second instance, there is no interference pattern or fringe shift.

C. Proposed new alternative correct →opposing counteracting anti–asymmetrical wave postulate← from the frame of the half-silvered mirror.

At 45 degrees relative to the ether wind, the two waves are in phase. Now, during rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*) and the other arm **asymmetrically**, progressively loses wavelengths (distance*). In this third case, the fringe shift produced would be related to the **difference (not the sum)** between these two functions.

This is a very intricate concept to visualize as now presented. At 0 degrees the to–and–fro arm (distance*) is greater than the crosswind arm (distance*), but at 45 degrees, they are both equal. In order for this to occur, the crosswind arm must gain fewer wavelengths compared to the loss of the number of wavelengths in the to–and–fro arm up to 45 degrees. Then from 45 degrees to 90 degrees the new to–and–fro arm must gain more wavelengths than the loss of the number of wavelengths in the new cross wind arm.

Bear in mind, the different theory/hypothesis/postulate can be differentiated from another both mathematically and visually.

For review:

1. (Classic/Standard Theory)

Incorrect parallel wave theory from the frame of the observer/telescope = fringe shift during rotation.

2. (Original proposed correct alternative hypothesis of Chapter 3)

There is assumed to be counteracting **anti–symmetrical** opposing waves from the frame of half-silvered mirror = no fringe shift during rotation.

3. (Proposed new second correct alternative postulate)

There is assumed to be counteracting **anti–asymmetrical** opposing waves from the frame of the half–silvered mirror = fringe shift during rotation but less than the parallel wave theory. What this establishes is that, during rotation, the predicted fringe shift regarding the classic incorrect parallel wave theory would be greater compared to the correct anti–asymmetrical postulate. Consequently, the classic parallel wave theory would supposedly be more sensitive compared to the anti–asymmetrical postulate.

Therefore, presupposing the parallel wave theory (mathematics) is utilized to calculate the theoretical expected fringe shift, but the new proposed anti–asymmetrical postulate is actually observed, then that conflicting result might not be considered as statistically significant, thus discarded/ignored, accordingly, a presumed false null outcome.

The quandary then is this: Without the use of mathematics which theory/hypothesis/postulate most likely represents reality?

In the author’s opinion, the interference pattern first forms at the half-silvered mirror from two counteracting opposing wavefronts so the →classic theory← can be discarded. This leaves the **anti–symmetrical** →hypothesis← and the **anti–asymmetrical** →postulate← as possibilities.

What is more, the author believes the **anti–asymmetrical** →postulate← is more likely correct than the **anti–symmetrical** →hypothesis←. And here is the reasoning.

(Before proceeding see figures 3.26, 3.27, and 3.28.) Assuming equal physical length of the arms, the *hypothesis* produces no fringe shift regardless of its orientation relative to the ether

wind, even at 0 degrees. **However, the ether wind does, in fact, produce a fringe shift at 0 degrees as illustrated in figures 3.12 and 3.14**—the two different scenarios are incompatible.

Alternatively, the different orientations, (0 degrees vs. 45 degrees (see figures 3.14 and 3.27)) are consistent with each other assuming counteracting **anti-symmetrical** opposing wavefronts from the frame of the half-silvered mirror. Now, there would be a fringe shift at 0 and 90 degrees as opposed to no shift at 45 degrees but of a lesser magnitude compared to the classic/standard theory. See Appendix L for a more complete explanation with figures.

For this reason, it is the author's opinion that the →postulate of counteracting asymmetrical opposing wavefronts← is more likely true than the →counteracting symmetrical hypothesis←. Nevertheless, this belief necessitates a rigorous mathematical proof for validation, moreover, experimental verification.

And so, for that latter reason, the author proposes the following two imaginary, **yet** less feasible, experiments as potential proof of the existence of the ether, *vis-à-vis* the anti-symmetrical hypothesis vs. the anti-symmetrical postulate.

First Proposed Experiment

Assuming the relative ether wind changes velocity between two different reference frames (defined as coordinate systems B and C in Appendix D), then a fringe shift occurs as a function of moving from one frame into another one. Examples of two different frames or coordinate systems using the MMX relative to the ECF/EGF would be:

Example 1

A. At the equator, sited on the rotating surface of the Earth, with one arm fixed/oriented south/north (S/N) and the other arm ~~fixed~~ west/east (W-E), thus 1,000 mph with respect to the ECF/EGF—a relative ether wind of 1,000 mph.

B. Assume the MMX is on an airplane traveling 600 mph, west to east, sited at the latitude of the equator with one arm fixed/oriented S-N and the other arm →fixed← W-E, therefore, equal to 1,600 mph with respect to the ECF/EGF—a relative ether wind of 1,600 mph. The two coordinate systems possess different velocities relative to the ECF/EGF, as much, different relative ether winds.

If one carries out a MMX "sited" on the Earth's rotating surface, fixed in the S-N, W-E directions (A), and subsequently at the same latitude, in the same mode, on an eastward bound airplane traveling 600 mph (B), then between these two frames, a different interference pattern emerges (postulate only).

Example 2

Additionally, if one performs the experiment fixed S-N, W-E, first at the equator, at rest with the Earth's rotating surface, 1,000 mph relative to the ether (ECF), and second at the South Pole, 0 mph relative to the ECF, there will again be a disparity in the shape of the interference patterns between these two frames (postulate only).

The reasoning behind the fringe shift is as follows. As the MMX increases its velocity relative to the ECF, moreover, as in Example 1 fixed and oriented S/N–W/E, there is a gain of (distances*) in both the to-and-fro arm (W-E), as well as the cross-wind arm (S-N). But it is proportionally greater in the to-and-fro arm. Consequently, there is a fringe shift as a function of an increasing velocity relative to the ECF.

1. The →anti-symmetrical postulate← would produce a fringe shift between the two different coordinate systems = proof of the ether.

2. The →anti-symmetrical hypothesis← would not produce a fringe shift between two different coordinate systems.

Second Proposed Experiment

Regarding this second experiment, relative to the ECF, EGF, one arm is fixed vertically in the upright position perpendicular to Earth and the other arm is fixed horizontally, parallel to the Earth's surface rotating, between the cross-wind direction (S-N, N-S) and the to-and-fro wind direction (W-E, E-W).

Consequently, vis-à-vis this experiment, the vertical arm (distance*) is stationary and constant. On the other hand, regarding the horizontal arm, as a direct function of rotation between (S-N, N-S) versus (W-E, E-W) the (distance*) then changes.

This is not the classical revolving motion of the MMX, which as originally performed is parallel to the Earth's surface (both arms). Referring to this new experiment, the rotational motion is along the axis of the fixed upright vertical arm, whereas the horizontal arm is moving parallel to the surface of the Earth (E-W, N-S). So assuming the new theory is valid (PFGRT), then regarding this alternative mode of the MMX, there should be a fringe shift, as a function of this form of rotation, a gain proof of **the ether**.

Bear in mind that in this scenario, there is no counteracting negating **anti-symmetry or anti-asymmetry** of the wavefronts of the two arms, from the frame of the half-silvered mirror; now there will be a fringe shift as a function of this form of rotation. As an aside, an MMX located inside a satellite in a circular orbit with one arm oriented radial to the Earth's center, whereas the other arm, alternating between parallel to transverse relative to its orbital motion, should also produce a **greater** fringe shift as a function of this form of rotation—a gain proof of the ether.

1. The →anti-asymmetrical postulate← would produce a fringe shift during rotation = proof of the ether.

2. The →anti-symmetrical hypothesis← would also produce a fringe shift during rotation, nevertheless, a slightly different fringe shift = proof of the ether.

These imaginary tests, if carried out as actual experiments, and if confirmed, would be evidence of a relative ether wind. So, in fact, the MMX can detect the ether wind but not in context as originally performed. The author cannot emphasize this enough. These alternate experiments of the MMX, as described above, and if verified, would then invalidate relativity, furthermore, attest to the existence of The Ether.

Conclusion

Given all the above, it is the author's opinion that the **classic/standard parallel wave theory explanation of the MMX is an erratum**, because the interference pattern does not occur at the telescope/observer but rather at the half-silvered mirror relevant to two counteracting opposing wavefronts.

Additionally, regarding these two opposing counteracting wavefronts, →the anti-asymmetrical postulate← more likely represents the real function of the MMX compared to the →anti-symmetrical hypothesis←. Nevertheless, again this assumption requires a vigorous mathematical proof with experimentation for confirmation.

Please read and review Appendix L, which explains, as well as illustrates, this last topic in much greater detail; especially note the figures.

3.3 The Kennedy–Thorndike Experiment

Unlike the MMX, whereby the physical lengths of the arms are approximately equal, the arms of the Kennedy–Thorndike experiment (KTE) are significantly unequal as presented below in Figure 3.29. Again, the KTE results were null.

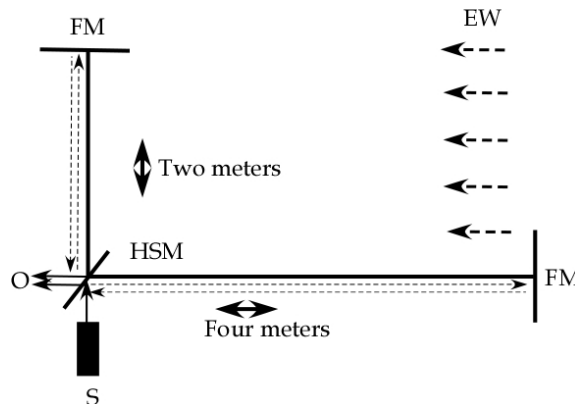


Figure 3.29 The Kennedy–Thorndike Experiment

- *O* = Observer (detector).
- *S* = Source of light.
- *HSM* = half-silvered mirror.
- *FM* = Full mirror.
- Dotted lines with arrows = pathways of light beams.
- *EW* = Ether wind.

Even though one arm was two meters and the other arm four meters, no fringe shift was observed.

In reality, it is virtually impossible to construct an MMX, such that the physical lengths of the arms are perfectly equal relative to a single wavelength of light. There is always a slight physical asymmetry. In principle, it is this asymmetry that makes a Kennedy–Thorndike speed of light interferometer (KTE).

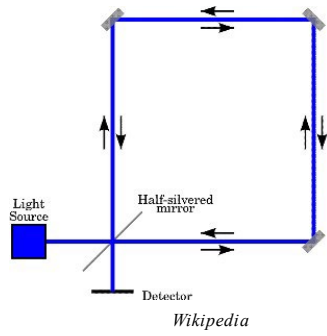
However, this is not obvious until the arms are significantly different in their physical lengths in order to be noticed, thus obvious. So, in fact, the MMX is a Kennedy–Thorndike Experiment (KTE). But what is crucial to note is this, the KTE outcome is null for the exactly same reason as just described with respect to the MMX as classically performed and interpreted.

Now, for the benefit of the novice, here is a re-explanation of this concept with perhaps more clarity. It should be realized that the classic MMX experiment is, in fact, the Kennedy–Thorndike experiment, because in practicality the physical length of the arms is always unequal relative to a single wavelength of light. It is only when the physical lengths of the arms are different enough to be noticeable that we then define it as the Kennedy–Thorndike Experiment. So, in fact, again, all MMX experiments are actually Kennedy–Thorndike experiments.

3.4 Sagnac Interferometer

The Sagnac effect is depicted below in figures 3.30, 3.31, and 3.33. Following the figure, there is an explanation. For the novice, a review of the YouTube website listed below is also recommended.

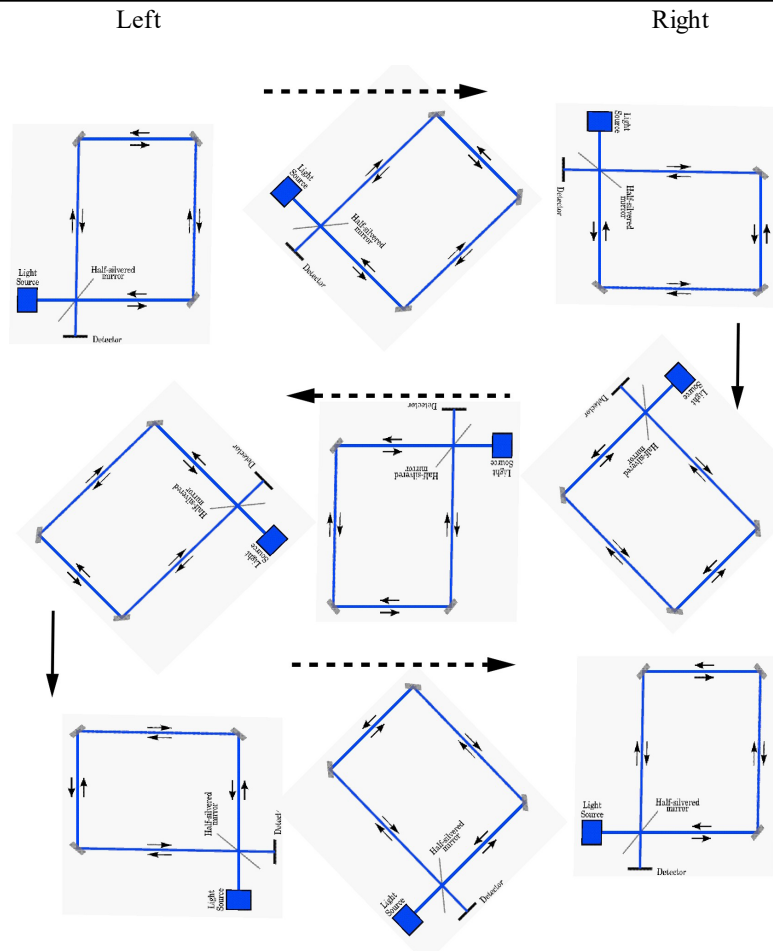
<https://www.youtube.com/watch?v=nRzoiT8d9mk>



George Sagnac

Figure 3.30 Sagnac Interferometer

- *Stationary scenario.*
 - *Light beams travel in opposite directions.*
 - *The (distances*) are equal.*
-



[Modification of Wikipedia drawing]

Figure 3.31 Position of SGE Throughout 360 Degrees of Rotation [Fair Use]
Labeling of graphic is the same as Figure 3.30 left.

- (*Distance**) = distance through ether.

When rotating clockwise, left to right, it takes light longer "interval of time" (*distance**) to travel in the clockwise direction versus the counterclockwise direction as compared to the setting where there is no rotation whereby there is no differentiation in (*distances**). For that reason, there is a fringe shift as a function of the rotational rate. This outcome can only occur if there is a preferred frame for light, which is independent of the intrinsic physical structure of the SE. The preferred frame is the EGF/ECF.

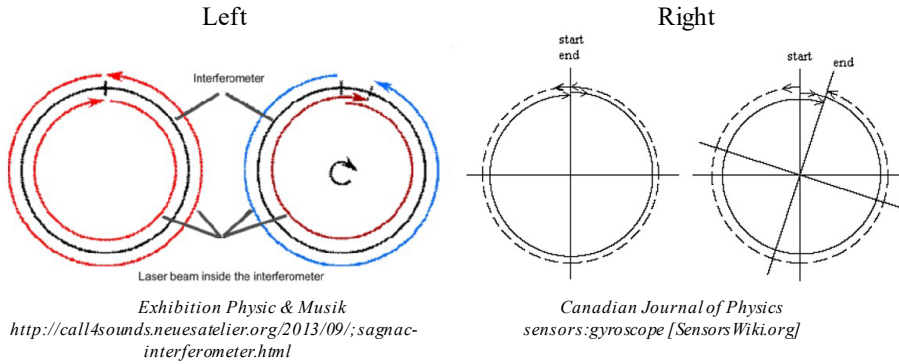


Figure 3.32 Fiber Optic Sagnac Interferometer [Fair Use]

- $(Distance^*) = distance\ of\ the\ light\ through\ the\ ether = (time)$.
- *Left = no rotation.*
- *Right = rotation.*
- *The circular arrows represent the (distances*).*

When rotating clockwise, from left to right, it takes light a longer interval of time (distance) to travel in the clockwise direction versus the counterclockwise direction, as compared to the setting when there is no rotation, whereby the two intervals of time (distances*) are equal. Again, this result mandates a preferred frame.*

Once again, this book assumes the EGF/ECF/ETHER/PFGRT inflow of space is the local preferred frame for the speed of light on Earth. These expressions are for the most part synonymous. Nevertheless, in order to avoid confusion, regarding the author's explanation of the Sagnac Experiment (SE), generally, but not exclusively, the term ether will be used.

So here is the explanation. With reference to the Sagnac experiment (SE), two light beams are projected in opposite directions around a square (Figure 3.30), utilizing reflecting mirrors, or else in a circular pathway with the use of a single fiber optic ring (Figure 3.32). Subsequently, they recombine at the origin to produce an interference pattern.

If the device is stationary, then the two intervals of time (distances*) that the beams travel through the ether are theoretically equal. Therefore, no interference pattern is generated, again assuming absolutely equal paths for the two opposing light beams.

Then again, with rotation, an interference pattern appears, moreover, as a function of the rotational rate. In order for this phenomenon to occur, there must be a preferred frame (EGF, ether), for only with a preferred frame can there be such a differentiation.

Here is the clarification. Light is fixed at (c) in a vacuum (ether) and slightly less than (c) within the atmosphere or glass fiber. With respect to these experiments, these are the preferred frames. Recall, the ether (ECF/EGF) is the absolute fixed frame, but the atmosphere or glass fiber modifies that fixed frame given that light travels from atom to atom (absorbed and then re-emitted). And so, as the experiment rotates, the two light beams still travel their rotational paths through the ether (ECF/EGF) in opposite directions; nevertheless, the experiment revolves in only one direction.

Accordingly, as a function of rotation, it takes a longer interval of time (distance*) for light to complete the circuit in one direction as compared to the other direction as they both traverse through the same fixed frame (ether, EGF, ECF) in opposite directions. And so a fringe shift emerges as a consequence of the SE rotational rate.

Note, regarding the glass fiber, the absorption and then re-emission processes also have a function, since that too results in a change of the (distances*) traveled by the two opposing light pathways.

With regard to rotational motion vs. nonrotational motion, unlike the MMX, the SE produces a fringe shift, however, only as a function of angular velocity.

On the other hand, these kinds of devices are unable to detect translation motion (see Figure 3.33 below), because with reference to that scenario, all components of the (SE) possess an equal translational velocity relative the ether, ECF/EGF/PFSRT/nonrotating inflow of space. As such, there is no differentiation of the (distances*) traveled by the opposing light beams, as a consequence of no motion versus translational motion.

This holds true for vertical translational motion (inflow of the ether), horizontal translational motion (e.g., sitting on the rotating surface of the Earth) or even linear translational motion with respect to the Earth's rotating surface (i.e., on an airplane). In summary, on the surface of the rotating Earth, small Sagnac experiments can only detect axial rotation of the experiment but not translational motion whether it is vertical or horizontal, as shown below.

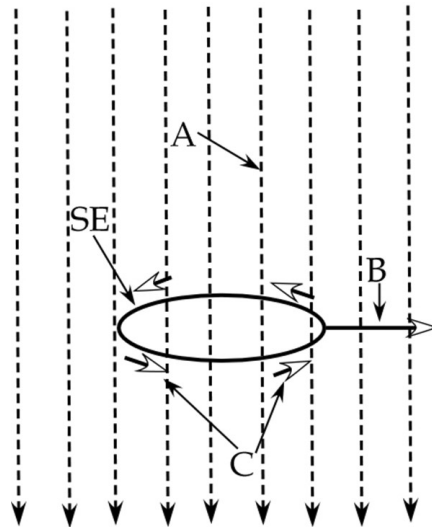


Figure 3.33 Sagnac Interferometer

- *SE = Sagnac experiment.*
- *A = Inflow of space (EGF).*
- *B = Translational horizontal motion of SE.*
- *C = Axial rotation of SE.*
- *(Distance*) = Distance through the ether = interval of time.*

With reference to the linear inflow of space (EGF) labeled A, and/or translational–horizontal velocity, labeled B, all components of the SE, possess an equal translational velocity. And so, regarding these reference frames and with respect to the opposing light waves, there is then no differentiation as to the "amounts of time" traveled through the ether (distances*).

In contrast, with internal axial rotation of the SE as depicted in C, the (distances*) traveled, for the two opposing light beams then differentiate. Consequently, there is a fringe shift as a

function of that rotational rate. In effect, the SE only detects internal axial rotation of its own physical structure but not translational motion.

3.5 The Michelson–Gale Experiment

The following quote is the abstract of the Michelson–Gale Experiment from the original article Michelson, A. A. (1925).

”The Effect of the Earth’s Rotation on the Velocity of Light, I.”

Astrophysical Journal 61: 137.

Bibcode:1925ApJ61137M. doi:10.1086/142878.

Air was exhausted from a twelve-inch pipe laid on the surface of the ground in the form of a rectangle 2010 x 2013 ft. Light from a carbon arc was divided at one corner by a thinly coated mirror into direct and reflected beams, which were reflected around the rectangle by mirrors at the corners. The two beams returning to the original mirror produced interference fringes. The beam traversing the rectangle in the counterclockwise direction was retarded. The observed displacement of the fringes was found to be 0.230 plus or minus 0.005 agreeing with the computed value of 0.0236 plus or minus 0.002 within the limits of experimental error.

The following is from the The Sinequanon a website by Andrew D. Iraci:

”The Michelson–Gale experiment may be the most grandiose optical experiment ever conducted. On a huge track of land in Clearing, Illinois, he and lab assistant Gordon Gale molded a water pipe that was a foot in diameter and over a mile long in the form of a giant rectangle with sides running 2,010 feet east to west and 1,113 feet north to south. They removed the air from the pipes, and using mirrors, sent two light beams in different directions within the rectangle, one clockwise and the other counterclockwise.

When the beams converged again, they found a fringe shift. Although the distance the light had traveled was the same, and the giant rectangle never moved, one beam took longer to complete its path than the other. ”Why?” As the Earth rotates, locations nearest the equator rotate the fastest while those nearest the poles move the slowest. The best way to comprehend this is to consider the fact that the circumference of the globe is about 25,000 miles at the equator, and so objects at the equator travel 25,000 miles in a day, or a little over 1,000 miles per hour. Conversely, objects closer to poles travel a smaller circumference in the same amount of time. Objects very near the pole may travel less than a few miles in 24 hours, or if it’s directly on the pole, it will not move at all (discounting the wobble of the Earth) and only spin slowly in a circle. Thus, if the Earth is rotating through the ether, then there is an ether wind that gusts toward the west at a little over a 1,000 miles per hour at the equator; and, this wind moves slower and slower with respect to Earth bound objects that are closer to the poles. In summary, the only variation in the speed of light we can detect on Earth is relative to the rotational velocity of the Earth. As the Earth spins within its sink vortex, it causes an aether wind at the surface of the Earth varying by latitude (zero at the poles and maximum at the equator).

The author’s internet research has uncovered that the aim, as first proposed by Albert A. Michelson in 1904 and then executed in 1925, was to find out whether the rotation of the Earth has an effect on the propagation of light near the Earth. ”Thus, the Michelson–Gale experiment, presenting a very large ring interferometer, (a perimeter of 1.9 kilometer), big enough to detect the angular velocity of the Earth. As in the original Michelson–Morley experiment, the Michelson–Gale–Pearson version compared the light from a single source (carbon arc) after traveling in two directions. The primary change was to replace the two arms of the original

MM version with two rectangles. Light was then sent into the rectangles in opposite directions, reflecting off mirrors at the corners and returned to the starting point. Light exiting the two rectangles was compared on a screen just as the light returning from the two arms would be in a standard MM experiment. The expected fringe shift was in accordance with the stationary ether and special relativity. In other words, this experiment was aimed to detect the Sagnac effect because of the Earth's rotation." (Reference: Wikipedia)

Result

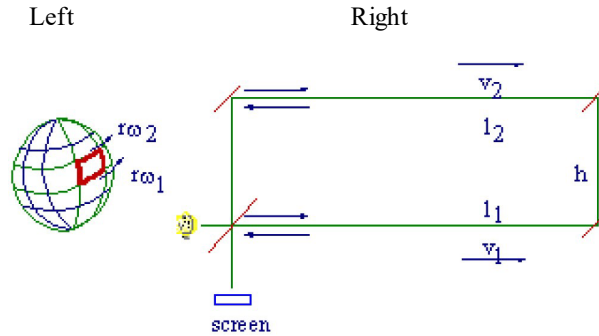
"The outcome of the experiment was that the angular velocity of the Earth as measured by astronomy was confirmed to within measuring accuracy. The ring interferometer of the Michelson-Gale experiment was not calibrated by comparison with an outside reference (which was not possible, because the setup was fixed to the Earth). From its design, it could be deduced where the central interference fringe ought to be if there would be zero shift. The measured shift was 230 parts in 1,000 with an accuracy of 5 parts in 1,000. The predicted shift was 237 parts in 1,000. According to Michelson/Gale, the experiment is compatible with both the idea of a stationary ether and special relativity." (Reference Wikipedia)

This author does not concur with the above conclusion that the Michelson-Gale Experiment (MGE) is compatible with SRT. What the author agrees with is the other deduction, which presumes the outcome of the MGE experiment is consistent with stationary ether corresponding to the ECF/EGF. (See figures 3.34 and 3.35.) Pay close attention to the following logic. The MGE square does not measure its own axial rotational motion analogous to the SE. It gauges something else.

Take note: The MGE is not the classic SE. The gravitational field of the Earth is a sphere. And the plane of the MGE is making a circular-like motion within this gravitational sphere, and the only reason it can detect the Earth's axial rotational velocity is that there are two relative ether winds. The square is not rotating on its own physical internal axis as occurs with the classic SE.

In order to explain the MGE, the author will exaggerate its dimensions. Assume a large perfect square, 500 miles per side, is placed flat on the surface of the Earth. The square consists of four single hollow vacuum tubes, whereby light can travel inside, with mirrors for reflection located at the corners. The bottom of the square is located parallel to the equator, moreover, at the equator, with a length of 500 miles. The top of the square is located 500 miles to the north, again parallel to the equator. The two sides connect the bottom and top. (The actual experiment was several kilometers per side.) In addition, assume the EGF/ECF is the preferred frame as postulated by this publication. Imagine looking at the Earth with the North Pole located at the top of the page and the South Pole at the bottom. In addition, the Earth rotates from left to right.

So, at the bottom of the square, located at the Equator, the relative velocity of the experiment with respect to EGF is 1,000 mph. And at the top of the square, 500 miles north, the relative velocity of the experiment with respect to the (EGF) is less than 1,000 mph, let's say 900 mph, as depicted in figures 3.34 and 3.35.



Credit: Dennis McCarthy

Figure 3.34 Relative Velocity (ECF) at Different Latitudes [Fair Use]

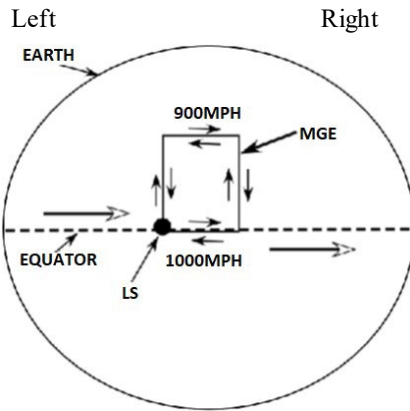


Figure 3.35 Effects of Latitude on Michelson–Gale Experiment

- Square = Michelson–Gale experiment.
- Earth = The circle.
- Dotted line is the equator.
- LS = Light source.
- Arrows associated with the sides of the MGE represent the opposing light beams.
- Hollow tip arrows = direction of the Earth’s rotation. The relative ether wind is in the opposite direction.
 - Bottom of square at equator = 1,000 mph relative ether wind right to left.
 - Top of square 500 miles north of equator = 900 mph relative ether wind right to left.

Regarding this experiment, two beams of light are sent in opposite directions around the square within the vacuum tubes. Observe, this experiment involves two relative ether winds, one equal to 1,000 mph at the equator, the other 900 mph, 500 miles to the north, both right to left. Both relative ether winds are from east to west. The term relative is used since the experiment is plowing through the ether (EGF/ECF) rather than vice versa, the latter of which would be a true ether wind.

Given this scenario, then on one hand, the clockwise beam, depicted by arrows located outside the square, encounters a 900-mph relative wind (against) at the top of the square, as it travels west to east, and a 1,000 mph relative wind (with) at the bottom of the square, when it travels east to west.

In contrast, the counterclockwise beam, represented by arrows located inside the square, encounters a 1,000 mph relative wind (against) at the bottom of the page, when it travels west to east, and a 900 mph relative wind (with) at the top of the page, as it travels east to west. The vertical sides are equal in both directions.

If one does the mathematical calculations, given two relative ether winds, it takes a longer "interval of time" (distance*) for light to travel counter-clockwise than clockwise. As a result, the infringement pattern produced is a function of the Earth's axial rotational velocity relative to the EGF, moreover, at the latitude of the experiment. The Michelson-Gale experiment MGE successfully measured this velocity.

Again, the SE and the MGE measure different aspects of the EGF. The SE measures internal axial rotation of the apparatus, whereas the MGE measures two relative ether winds, given the fact that its plane is making a circular-like motion within the sphere of the EGF. Additionally, given its small size, the SE is not sensitive to detect two relative ether winds.

For example, if the original smaller MGE experiment were placed precisely straddling the equator with only one relative ether wind, it would then be incapable of identifying the Earth's rotational velocity. Alternatively, a classic SE placed at the equator would exhibit a fringe shift when rotating rapidly on its own internal axis. However, it would also not detect the Earth's axial rotational velocity at any latitude (small size).

Furthermore, if the MGE were placed at the North Pole, it would then be somewhat analogous to the classic SE, but its internal axis rotational velocity would be equal to 360 degrees for every 24 hours, perhaps too slow to measure. In contrast, at the pole, if one could rotate the MGE significantly faster than once every 24 hours, it would then be exactly analogous to the classic SE.

3.6 The Mössbauer Experiment

There is another classic test used as a proof for Einstein's SRT/GRT. It is known as the spinning Mössbauer experiment (SMoE). However, the following partial abstract written by Ronald Hatch, citing Howard Haden, explains how even that experiment is silent as to whether or not the ether exists. This topic is very complex, in fact, so elaborate that in the author's opinion, its complete explanation would distract the reader from the main ideas presented in this chapter. Therefore, its full narrative will be left to another time and place. But suffice it to say, this experiment, →given the physical orientation as originally performed←, cannot identify the ether wind.

Nevertheless, it does demonstrate the relativistic effects of "time dilation" as a function of acceleration/angular velocity with respect to the ECF/EGF. The quote below is a partial abstract that refutes the notion that the MoE is proof of SRT.

Partial Abstract From Hayden, Howard C. (1992) "Rotating Mössbauer Experiments and the Speed of Light," Galilean Electrodynamics, Vol. 3, No. 6, Nov.

Spinning Mössbauer experiments, with gamma ray source and detector on a spinning disk, are frequently cited as providing strong evidence in support of the special theory. However, as Hayden has shown, the claims are generally based upon two separate phenomena. The abstract suggested that one could detect the variation of the transit time across either the radius or diameter of the spinning disk if an ether wind were present. Turner and Hill looked for a change in the frequency of the gamma rays as a function of the

source velocity. If an ether wind were present, then a modulation of the frequency with the spin would presumably appear. Ruderfer, in an erratum, pointed out that the two effects would cancel and render the experiment incapable of detecting an ether wind. In spite of this erratum, the claims are repeatedly found in the literature that the spinning Mössbauer experiments support the special theory. They do not. They are simply moot on the subject.

The author of this publication posits a slightly different hypothesis as to the reason why the spinning Mössbauer experiment (SMoE) is incapable of detecting the ether wind. However, just as Ruderfer postulated, it does involve compensatory counteracting functions. Nevertheless, these negating processes are somewhat different from those posited above, although the end results are almost the same. Before proceeding, some basic principles of physics are presented. The following quotes were found on the internet—most specifically, the *Encyclopedia Britannica*. The quotes explain the underlying physics of the Mössbauer effect. Following the quotes is the author's explanation of the Mössbauer effect, mainly for the benefit of the novice.

The Classic Explanation:

The Mössbauer effect, or recoilless nuclear resonance fluorescence, is a physical phenomenon discovered by Rudolf Mössbauer in 1958. It involves the resonant and recoil-free emission and absorption of gamma radiation by atomic nuclei bound in a solid. Its main application is in Mössbauer spectroscopy.

In the Mössbauer effect, the narrow resonance absorption for nuclear gamma absorption can be successfully attained by physically immobilizing atomic nuclei in a crystal. The immobilization of nuclei at both ends of a gamma resonance interaction is required so that no gamma energy is lost to the kinetic energy of recoiling nuclei at either the emitting or absorbing end of a gamma transition. Such loss of energy causes gamma ray resonance absorption to fail. However, when emitted gamma rays carry essentially all of the energy of the atomic nuclear de-excitation that produces them, this energy is also sufficient to excite the same energy state in a second immobilized nucleus of the same type.

The Mössbauer effect is a process in which a nucleus emits or absorbs gamma rays without loss of energy from a nuclear recoil. It was discovered by the German physicist Rudolf L. Mössbauer in 1958 and has proved to be remarkably useful for basic research in physics and chemistry. It has been used, for instance, in precisely measuring small energy changes in nuclei, atoms, and crystals induced by electrical, magnetic, or gravitational fields. In a transition of a nucleus from a higher to a lower energy state with accompanying emission of gamma rays, the emission generally causes the nucleus to recoil, and this takes energy from the emitted gamma rays. Thus, the gamma rays do not have sufficient energy to excite a target nucleus to be examined. However, Mössbauer discovered that it is possible to have transitions in which the recoil is absorbed by a whole crystal in which the emitting nucleus is bound. "Under these circumstances, the energy that goes into the recoil is a negligible portion of the energy of the transition. Therefore, the emitted gamma rays carry virtually all of the energy liberated by the nuclear transition. The gamma rays thus are able to induce a reverse transition, under similar conditions of negligible recoil, in a target nucleus of the same material as the emitter but in a lower energy state. In general, gamma rays are produced by nuclear transitions from an unstable high-energy state, to a stable low-energy state. The energy of the emitted gamma ray corresponds to the energy of the nuclear transition, minus an amount of energy that is lost as recoil to the emitting atom. If the lost "recoil energy" is small compared with the energy line width of the nuclear transition, then the gamma ray energy still corresponds to the energy of the nuclear transition, and the gamma ray can be absorbed by a second atom of the same type as the first. This emission and subsequent absorption is called resonant fluorescence. Addi-

tional recoil energy is also lost during absorption, so for resonance to occur, the recoil energy must actually be less than half the line width for the corresponding nuclear transition.

The quotes cited above are brief classic explanations of the Mössbauer effect as found primarily in the *Encyclopedia Britannica*.

The Author's Explanation:

With reference to a given radioactive emitting element, if one of its nuclei emits a gamma photon (source), then a recoil force is exerted on that nucleus.

In addition, regarding that emitted photon, moreover, as a function of recoil, a redshift ensues. On the other hand, if the "source nucleus" is fixed within a solid lattice, then these recoil/redshift interactions cannot transpire.

Conversely, assuming the same kind of nucleus absorbs an identical gamma photon, then for that nucleus (detector), this interaction produces momentum, furthermore, a redshift for that photon. But again, if the "detector nucleus" is part of a solid fixed lattice, then no momentum ensues and no redshift occurs.

Therefore, if one posits that the nuclei of both the source and detector are functionally identical, moreover, if both are a part of the same type of fixed solid lattice, the emission frequency (energy) is then equal to the absorption frequency. Presuming these circumstances are in effect, energy is then transferred, without loss, from the source nucleus to the detector nucleus, furthermore, recorded by the proportional counter (PC). In essence, this explanation is the Mössbauer effect. Alternatively, if the frequencies of the source versus the detector diverge, there is either absent or else reduced absorption, so, in turn, decreased recording/counting by the PC.

There are different kinds of spinning Mössbauer experiments. One simplified model is rendered below in Figure 3.36 followed by a written dissertation.

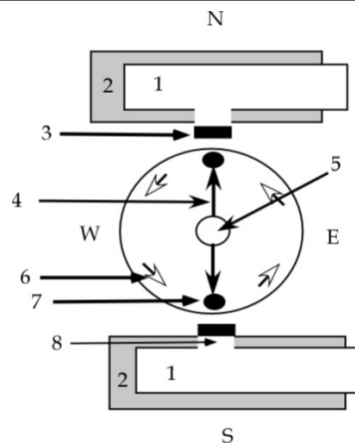


Figure 3.36 Simplified Spinning Mössbauer Experiment

1. Proportional counters.
2. Lead shielding.
3. Windows.
4. Direction of photons from source to detector.
5. Source.
6. Direction of rotation of rotator.
7. Detector.

8. *Pathway to the proportional counter detector through the lead shield.*

9. *N-S, E-W = directions.*

Imagine that a source (5) and two detectors (7), made of the same radioactive-emitting and absorbing material, located within a fixed lattice, moreover, exhibiting the Mössbauer effect, are placed on a rotor, as shown above. The source is located at the center, whereas the two detectors, which absorb the photons, are positioned, at the periphery, 180 degrees apart. In addition, the two halves of the apparatus, which counts or records the absorbed photons (1), is consigned outside the rotor, explicitly oriented along the north-south axis (EGF). The name given to this device is "proportional counter" (PC).

It should be recognized, that the two classic renowned confirmatory spinning Mössbauer experiments (SMoE) performed by Champeney, Isaak, and Kahn and the other by Turner and Hill, acquired their measurements, using a PC, which was specifically oriented along the north-south axis relative to the (EGF). As it will be shown later, this specific orientation, as originally performed, is a crucial part of the explanation as for why the SMoE did not detect the ether wind.

Notice in Figure 3.36, the two sides of the proportional counter are positioned along the N-S axis. In addition, observe that the emitted photons from the source to detectors, when absorbed, are traveling in the N-S and S-N directions. For that reason, the measurements of the absorbed photons are acquired only when the rotating detectors are traveling directly E-W or alternatively directly W-E.

For reinforcement, presuppose the rotor with attached devices is ramped up to 36,000 rpm. Additionally, presume during rotation, photons are emitted from the central source to the peripheral detectors. And assume the measurements are obtained relative to the two detectors only when they are traveling along the E-W, W-E axes, which is at the exact time when the photons are traveling from source to the detectors in the N-S, S-N directions.

The following descriptions are extremely complex and multifaceted, so for the average reader probably difficult to decipher. In addition, the ideas presented below are also very hard to visualize, moreover, describe. Even so, the author will attempt to make the explanations as simple as possible.

Now, vis-à-vis the following discussions, six postulates are presented representing distinct concepts that when woven together in different ways, then clarify why the SMoE is incapable of detecting the ether wind, specifically in the orientation as originally performed. To start with, the following two sections describe the SMoE relevant to two different sets of assumptions/theories.

F-1. SRT/GRT

F-2. PFSRT/PFGRT

F-1. From the Reference Frame of the Assumptions of SRT, GRT, or Alternatively Stationary Ether

Depicted in figures 3.36 and 3.37, furthermore, as delineated in the following paragraphs, is an explanation of the SMoE pertaining to the assumptions associated with Einstein's SRT, GRT, or alternatively stationary ether.

Postulate 1

Assuming there is no ether, as postulated by Einstein or alternately stationary ether, →the source is then located at rest with the observer←. Consequently, whenever the two detectors rotate exceedingly rapidly, both acquire equal relativistic angular velocity/acceleration with respect to the source. As a result, a gain compared to the source, their relativistic rates of time (frequency) symmetrically decrease.

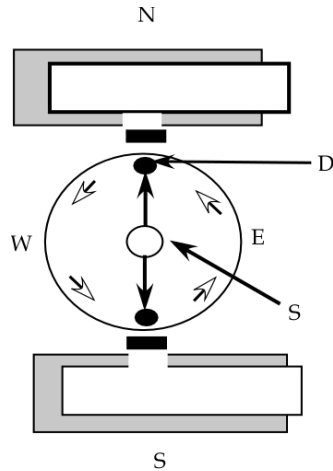


Figure 3.37

- *S with arrow = source* • *D = detector*
- *E = east* • *W = west*
- *Hollow arrows = direction of rotor's rotation*
- *Solid vertical arrows (N-S) = directions of photons (light) when counted.*

Consequently, the Mössbauer frequency relationship (resonant fluorescence) between source and the two detectors then falls out of sync. Essentially, there is a diminution in the number of counts by the PC. Therefore, vis-à-vis this scenario, "time dilation" occurs as a function of the two detector's relativistic acceleration/angular velocity with respect to the source/observer.

Postulate 2

When the S-N, S-N photons are absorbed, the detectors at that time are traveling E-W, W-E, moreover, at a right angle to the photons (S-N, N-S). So, from the frame of the detectors, a classic transverse observer Doppler redshift effect occurs. Furthermore, this redshift phenomena is symmetrical with respect to both the S-N and N-S photons. As such, the Mössbauer frequency relationship (resonant fluorescence) between the source and the two detectors again falls out of sync.

Postulate 3

In other words, vis-à-vis this experiment, the decrease in resonance is a function of:

1. **Relativistic** time "dilatation" of the detector compared to the source = redshift.
2. The **classic** transverse observer Doppler effect (CTODE), from the frame of the detectors, traveling (E-W, W-E), vs. the photons traversing (S-N, N-S) = redshift.

These two functions in combination are defined as the **relativistic** transverse observer Doppler effect and characterized in this subdivision by the letters (RTODE).

Effectively, the **classic** transverse observer Doppler effect (CTODE) transforms into the **relativistic** transverse observer Doppler effect (RTODE) with the superimposition of relativistic time dilation. So, when reading the following paragraphs, please pay attention to when each term is used and their different meanings.

For review

1. **Classic** transverse observer Doppler effect = observer redshift Doppler effect from the frame of the detector without time dilation (CTODE).
2. **Relativistic** transverse observer Doppler effect = classic transverse observer redshift Doppler effect from the frame of the detector, with superimposed relativistic time dilation (RTODE).

Postulate 4

SRT postulates there is no ether.

The first three postulates apply to SRT/GRT, but, also to a stationary ether. On the other hand, what occurs if there is a relative ether wind (ECF/EGF)? That answer is presented in the following section.

F–2. From the Reference Frame of the Assumptions of PFGRT/EGF/ECF

Portrayed below in figures 3.38 and 3.39, and subsequently explained in the following captions and paragraphs, is a limited description of the SMoE, but in this case, from the reference frame of ECF/EGF (relative ether wind). See Figure 3.38 below.

Postulate 5

Concerning the following discussion, the concept of relativistic rate of time (frequency) of detector versus source/(ECF) is employed, as well as the notion of the ether wind. Alternatively, the concept of Classic Transverse Observer Doppler Effect (CTODE) is at this time ignored.

1. Relativistic time dilation of the detectors relative to source (utilized)–Postulate 1.
2. The ether wind (utilized).
3. Classic transverse observer Doppler effect (ignored)–Postulate 2.

Therefore, presuming the scenario whereby there is a relative ether wind (ECF/EGF), then regarding the PC recordings, there should be an additional "falling out of resonance" between source and the two detectors, furthermore, superimposed upon the relativistic time dilatation effect (Postulate 1). This is because when compared to the source, as the detector rotates west to east, against the ether wind, its relative velocity with respect to the ECF/EGF then increases. So equated to the source, its "rate of time" (frequency) decreases.

And when compared to the source, while rotating east to west, along with the ether wind (A), its relative velocity with respect to the ECF/EGF then decreases.

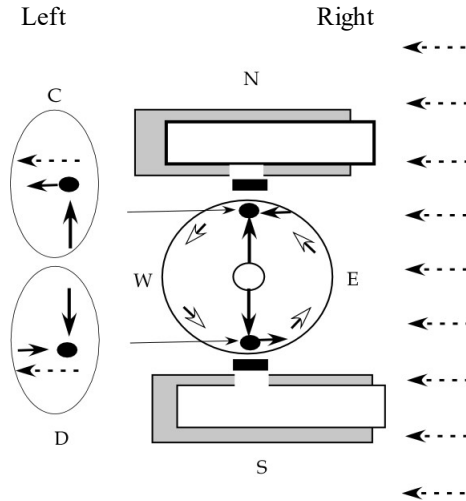


Figure 3.38

1. The direction of the relative ether wind (EGF/ECF) is depicted by the vertical series of dotted horizontal arrows, (right to left) located on the right and also by the single dotted horizontal arrow found within the circles.
2. The solid horizontal arrows associated with the black dot, sited within the circles, represent the velocity of the detector relative to the source, but only when traveling (E–W, W–E).
3. The circles C and D containing the two horizontal arrows, viewed together, represent the detector’s velocity relative to the ether wind (ECF) but only specifically in the (E–W, W–E) orientations as shown (D ether wind > C ether wind).

Therefore, equated to the source, its rate of time (frequency) increases. Observe, these two scenarios are anti-symmetrical functions; nevertheless, both result in a change of resonance.

At this juncture, presume Postulate 3 is also apropos. Consequently, given all the above, whereby the detectors are specifically traveling/measuring (W–E, E–W), as opposed to the other directions, the PC recordings should then be out of sync (resonance) →compared← to Postulate 3. This expected conclusion is defined as Postulate 5. Essentially, Postulate 5 is a modification/superimposition of Postulate 3.

What is more, Postulate 5 has never been experimentally confirmed. For that reason, this null outcome is posited as proof of the absence of the ether wind, analogous to the MMX.

However, the experimenters overlooked several factors as now clarified in the figure below and in the following dialog. However, first for review, see Figure 3.39, a repeat of Figure 3.38.

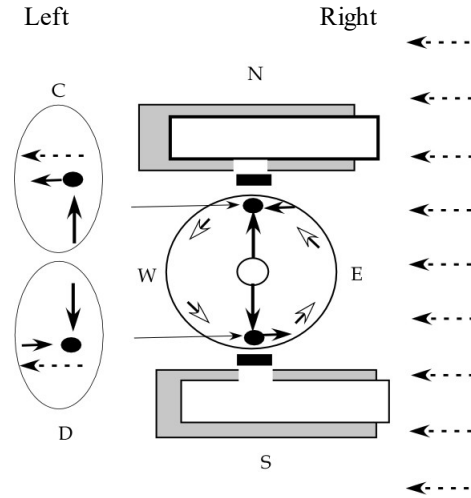


Figure 3.39 Repeat of Figure 3.38

For review, the SMoE utilizes the M \ddot{o} ssbauer effect to gauge a change in the rate of time (RTODE) as a function of the two detector’s relativistic acceleration/angular velocity relative to the source, actually the ECF/EGF and also whether or not there is an ether wind but for the latter in–erratum.

Once again, the M \ddot{o} ssbauer effect is this: The source emits a gamma photon with a given frequency and without energy loss. And the detector only absorbs that photon if it possesses the same energy as the emission frequency. Alternatively, when the frequencies of the source vs. detectors diverge, there is then reduced absorption correlated to the amount of divergence.

The following explanation initially overlooks the ether wind (relative ether wind); however, that topic will be dealt with later in the following passages. Relative to the ECF/EGF, when the two detectors rotate with relativistic angular velocity/acceleration, then compared to the nonrotating source, their rates of time (frequency) symmetrically decrease (Postulate 3).

Consequently, in this setting, there is a decline in the number of recorded/absorbed photons (resonance). In other words, the experiment proves (time dilation) is a function of the detector’s relativistic acceleration/angular velocity with respect to the ECF/EGF, but more importantly, even though not readily apparent, not relative to the source/observer (SRT/GRT).

The only difference between Einstein’s SRT/GRT and this postulate ECF/EGF is that in this scenario, all is relative to the EGF/ECF, rather than from the frame of only the observer. But notice, regarding these two different theories, the final measured results are almost identical. Nevertheless, the underlying principles of physics are different.

The word “almost” is used because the above two scenarios are not quite the same. This is **partially** because the source frequency/rate of time is faster, assuming the SMoE exists at rest with the ECF compared to if there is a relative ether wind. For instance, presupposing the existence of the ECF (relative ether wind) the source frequency/rate of time, located at the equator, would then be slower (1,000 mph relative ether wind) compared to at the Earth’s poles (0 mph relative ether wind). In contrast, using Einstein’s assumptions (SRT GRT), this source divergence is, by definition, not possible, since all is relative to only the observer. One can now visualize why these two different theories are almost, but not precisely, identical.

Postulate 6

(For the novice, before proceeding further, please see Figure 3.40 below.) The following explanation relates specifically **to only the ether wind** or more precisely the relative ether wind (EGF). Postulate 6 describes how the two detector's (W-E, E-W) changing rates of time (change in frequency), as a function of the E-W ether wind, are then counteracted (stable resonance), again from the frame of the detectors by the Doppler function of that same E-W ether wind. This is because it carries the N-S, S-N photons along with its own motion.

And so, with respect to the ether wind, whenever the detector rotates directly against it (west to east), then compared to the source, its velocity relative to the ECF/EGF increases. As a result, again compared to the source, its rate of time/frequency decreases.

Simultaneously, with respect to this specific geometry, photons emitted from the source to the detector, moreover, from the frame of the detector, are redshifted to a lower frequency.

This is due to the E-W ether wind effect exerted on the N-S photons, thus producing a redshift ether Doppler effect of those photons. Alternately stated, there is observer aberration/redshift Doppler from the frame of the W-E detector as a function of the deflection of the N-S photons, because they are carried along with the motion of that ether wind (essentially, an ether wind aberration/Doppler effect).

Therefore, overall, combining both functions then from the perspective of the detector, these counteracting effects negate one another.

In other words, as a product of the E-W ether wind, regarding only these two specific counteracting functions of decreased rate of time of the detector versus the redshift Doppler effect produced by the same ether wind on the N-S photons (again from the frame to the detector), then the interaction of the photons with respect to the source and detector remain in sync (resonance). Now pertinent to this supposition, one key concept to recognize (regarding physics in general) is not only is there source and observer aberration/Doppler effects, but there is also an ether wind aberration/Doppler effect.

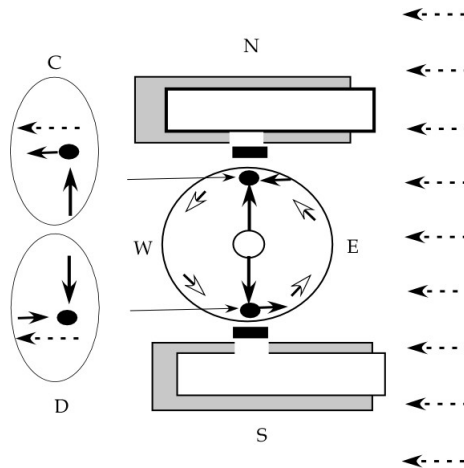


Figure 3.40
C = Blueshift, D = Redshift

- The horizontal series of dotted arrows on the right and also the single horizontal dotted arrow located within each oval represent the direction of the ether wind relative to ECF/EGF.

- The solid vertical arrows depict the direction of the photons from source to detector (N–S, S–N) when the absorbed photons are measured.
- The solid horizontal arrows associated with the black dot, located within the ovals, portray the direction of the rotating detector when the absorbed photons are measured (E–W, W–E).
- The ovals (C and D) containing the two horizontal internal arrows, moreover, viewed together, represent the detector's relative velocity with respect to the ether wind (ECF) but only specifically in the (E–W, W–E) orientations as shown.
- The ovals (C and D) also demonstrate, from the frame of the detector, when the photons are counted E–W, W–E, the frequency changes produced by effect of the ether wind on the (N–S, S–N) photons (a form of aberration/Doppler shift of light).
- For D, there is a redshift and for C a blueshift. See below.
- Again, for reinforcement, the ovals labeled C and D symbolize the change in frequency of received photons, from the perspective of the detector, when the photons are measured. The Doppler frequency change is a function of the transverse velocity of the detector (E–W, W–E) relative to the vertical directions of the emitted photons from source to the detectors (S–N, N–S), the latter which are carried along with the ether wind. This is a form of light aberration/Doppler shift.

Note: for both positions C and D, which is the frame of the detector, the relativistic changes in the "rate of time" of the detector vs. the effect of the ether wind on the N–S, S–N photons, counteract one another.

Conversely, whenever the detector rotates directly with the ether wind (E–W) then compared to the source, its velocity relative to the **ECF/EGF** decreases. So, in this setting, versus the source, its rate of time/frequency then increases.

Simultaneously, relevant to this specific geometry, photons emitted from the source to the detector, moreover, from the frame of the detector, are blueshifted to a higher frequency.

This is due to the E–W ether wind effect exerted on the S–N photons, thus producing a blueshift ether Doppler effect on those photons (essentially an ether wind aberration/Doppler effect). That is to say, as a function of the deflection of the S–N photons, because those photons are carried along with the motion of the ether wind, there is then an observer blueshift Doppler from the frame of the E–W detector.

Therefore, overall, combining both functions from the perspective of the detector, these counteracting effects negate one another.

In other words, as a product of the ether wind, regarding only these two specific counteracting functions of increased rate of time of the detector versus the blueshift Doppler effect exerted on the S–N photons from that same ether wind (again from the frame of the detector), then the interaction of the photons with respect to the source and detector remain in sync (resonance).

Again, pertinent to this supposition, one key concept to recognize (regarding physics in general) is not only is there source and observer aberration/Doppler effects, but there is also an ether wind aberration/Doppler effects.

For reinforcement, Postulate 6 refers specifically to the detectors (E–W, W–E) and the photons (N–S, S–N) and how they are both affected by the same E–W ether wind. Therefore, **from the frame of the detectors**, moreover, as a function of only the E–W ether wind, then the changing rates of time (**change in frequency**) is counteracted by the Doppler effects produced by that same ether wind relevant to the (N–S, S–N) photons (**change in frequency**). Take note: The changes in frequency regarding these two separate functions are symmetrical. As such, no alteration in resonance occurs from the frame of the detector specifically as a function of only the ether wind.

So, overall, for both the above E–W and W–E scenarios, even though the ether wind exists, it is undetectable using this specific orientational mode of the spinning MoE. Observe, "time dilatation" (RTODE) of the detectors still remains as a function of their acceleration/angular velocity with respect to the source (actually the ECF/EGF).

In summary, the Mössbauer experiment proves the relativistic effects of time dilation as a function of angular velocity/acceleration of the detector relative to the ECF/EGF. On the other hand, as a separate function, it is silent as to whether or not the ether exists (ether wind) but only as classically performed—specifically, when measured by the detectors as they travel along the east–west/west–east axis of the ECF.

Again, recall that the two classically renowned confirmatory Mössbauer experiments performed by Champeney, Isaak, Kahn, and the other by Turner and Hill, acquired their measurements by the detectors only along the (E–W, W–E) axis. In other words, the PC was oriented in the N–S axis.

So, given that, reflect this: The experimental outcome would be different, assuming the two sides of the proportional counter are sited along the E–W axis rather than S–N, as shown below in Figure 3.40.

In this scenario, as presented below in Figure 3.41, the photons from the source to the detectors when measured/absorbed are traveling E–W and W–E. For that reason, as a function of the ether wind, the photons emitted traveling east are redshifted, and the photons traveling west are blueshifted.

Consequently, from **only the frame of the two detectors**, at this time traveling/measuring/absorbing in the S–N, N–S orientations, the counteracting relativistic rate of time changes vs. the Doppler effect exerted on the photons, (blueshift/redshift), both functions of the ether wind previously present with reference to the E–W, W–E scenarios are now, in this setting, absent.

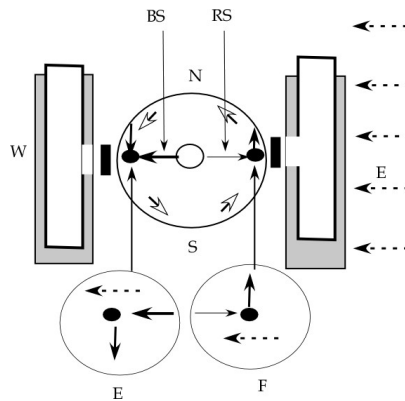


Figure 3.41 Figure 3.36 but Rotated 90 Degrees

1. Figure 3.40 rotates the classic alignment of the MoE 90 degrees counterclockwise. Therefore, the PC is then located along the E–W axis.
2. The vertical series of dotted horizontal arrows on the right and also the single horizontal dotted arrow located within the circles represent the direction of the ether wind.
3. The vertical solid arrows portray the directional velocity of the detectors (S–N, N–S) when the photons are measured.

4. *The horizontal solid arrows within the ovals show the direction of the photons from source to detector, when measured, (E–W W–E) with the thin arrow representing a redshift and the thicker arrow symbolizing a blueshift, both as a function of the ether wind.*

5. *Again, as a function of the ether wind, the photons traveling east are redshifted, and the photons traveling west are blueshifted.*

6. *So in this setting, the recordings by the PC are performed along the N–S axis rather than the E–W axis.*

7. *As a result, from the frame of the detector, the counteracting symmetry between relativistic changes in the rate of time of the detector vs. the effect of the ether wind on the N–S, S–N photons, which occur when the measurements are acquired in the E–W, W–E axis, now, as in this setting are absent, as demonstrated in ovals (E and F).*

Essentially, there will be a different result (number of PC recordings) depending upon whether the PC is oriented E–W vs. S–N.

With reference to this specific experimental orientation, this alternate mode of the spinning Mössbauer experiment (PC orientation of E–W, rather than N–S) is a true test of the anisotropy of the speed of light relative to the (EGF/ECF). Basically, the reason why the experimenters failed to detect the ether wind is because of their choice of the axis of the PC along the N–S direction.

Alternately, in the future, if the experimenters were to change the measuring axis of the PC from N–S to E–W, furthermore, as postulated as above, if those specific different experimental results are observed, then this alternate mode of the SMOE, rather than being evidence of the absence of the ether wind, will instead then be a proof of its existence.

3.7 SRT—The Simultaneity Problem

Recall the quote as given below from Chapter 2 regarding simultaneity. After reading chapters 1 and 3, the alternative explanation previously given by the author should now be much clearer.

In special relativity the relativity of simultaneity is explained with the following example. We have one frame of reference, a train moving from left to right with constant speed v relative to the embankment, and second frame of reference, the embankment itself. On the embankment, there are points A and B and their midpoint M . On the train, there is the point M' . When M and M' meet each other, two lightning strikes at both A and B . The observer on the embankment sees that the two flashes of light meet at the midpoint M . But since the train is moving and the point M' with it, M' moves towards B , and, therefore, the observer on the train will see that the beam from B will arrive first at point M' and after that will arrive the beam from A . And so simultaneity is relative for one observer; the two events are simultaneous, but for the other, they are not. (Physics Forum online)

So as presented above (SRT), referring to various diverse inertial frames, the perceived timing of events is different. On the other hand, if there is a preferred frame (not the observer), with an ether wind, then the above classic example can be explained by another methodology.

For instance, in the scenario where there is an ether wind with respect to the Earth-centered frame ECF/Earth's gravitational field EGF/ether, then as a result, neither the observer of reference frame M or M' receives the flashes simultaneously. This is because the observer of frame M and the two lightning bolts possess the same velocity relative to the ECF/EGF/ether as a consequence of all three rotating synchronously along with the spinning Earth at its surface.

This is assuming the train is traveling west–east and the flashes of lightning are in front of and behind the train; then it takes light longer to travel west–east compared to east–west.

In contrast, the observer of frame M' possesses a different velocity with respect to the ECF/EGF/ether given the fact that while riding on the train, M' is then traveling at a greater velocity with respect to the rotating surface of the Earth. As a result, M' velocity relative to the ECF/EGF/ether is greater than M . Therefore, the time interval of the asynchrony of the observed lightning bolts is greater for M' compared to M . →Observe, this alternative explanation of simultaneity as a function of the ether wind is now much clearer compared to when first explained in Chapter 1←.

3.8 Summary

A gravitational field, such as the one associated with Earth, is the local preferred frame for the speed of light on Earth. Global Earth experiments, which by necessity must be performed in an accelerated field, with curvature and rotation, are assumed to be consistent with relativity (GRT), just not SRT. Essentially, they are assumed to be Sagnac experiments (GRT). One key point to remember is that they directly measure the speed of light; moreover, they demonstrate anisotropy. In contrast, small local linear experiments, such as the MMX, do not directly determine the speed of light, what is more, they produce isotropy.

These two categories of experiments contradict one another. The divergence is assumed to be related to linear/inertial motion as opposed to accelerated motion (SRT vs. GRT). So the author asks, intuitively, where does the truth lie?

To the author, it is obvious. The fault lies in the fact that other than pure mathematics; relativity is artificially divided into SRT and GRT. It is not logical to assume that both types of experiments measure the same reality with differing results given that all of the experiments occur within the Earth's one gravitational field.

In addition, GRT and SRT are mathematically functional/compatible, though not always logical given contradictions, such as the twin paradox problem and the quandary of simultaneity. And as a corollary, SRT and GRT are abstract mathematical constructs and just like the Ptolemaic theory, not always compatible with actual reality, therefore, at times, confusing.

But as demonstrated by this chapter, if the MMX null result as originally performed/interpreted is, in fact, silent as to whether or not the ether exists, then these two categories of experiments are compatible with one another, moreover, connected by the ether.

The most important concept to take home is this: In discarding the MMX (second-order experiment) by proving it incapable of detecting the ether wind **as classically performed/interpreted**, then, by default, the preferred frame for the speed of light is related to only the gravitational field (PGRT).

Now, if the ether is proven as real, then modern-day physicists need to advance new theories of relativity, as well as QM, but now based upon the ether's existence rather than its absence, such as those posited in chapters 1, 2, and 4 of this publication.

Relativity buried the ether at the beginning of the 20th century; however, if this book's postulates are correct, at the dawn of the 21st century, the ether is resurrected, and all of physics changes.

CHAPTER 4

QUANTUM MECHANICS (QM) AS A FUNCTION OF THE ETHER

Chapter 4 is divided into seven sections:

- 4.1 Introduction
- 4.2 The Bohr Model
- 4.3 The (QM) Model
- 4.4 The Modified Bohr Model
- 4.5 The Dual Nature of Light
- 4.6 Conclusion
- 4.7 Epilogue

Prologue

For a more detailed explanation of the concepts presented within this chapter, a review of appendixes E, I, and J is suggested. But first, the *Merriam-Webster Dictionary* definition of quantum mechanics: *a theory of matter that is based on the concept of the possession of wave properties by elementary particles, that affords a mathematical interpretation of the structure and interactions of matter on the basis of these properties, and that incorporates within it quantum theory and the uncertainty principle—called also wave mechanics.*

Essentially the purpose of this chapter is to posit a three-dimensional model of the micro-world of the universe as a function of the ether, moreover, equivalent to the purely mathematical micro-world of quantum mechanics (QM).

4.1 Introduction

A small minority of modern-day dissident physicists have endeavored to substitute the concept of the ether with other terminology, such as zero-point energy, virtual particles, quantum foam, and the Higgs field. It is the author's opinion that this is their attempt to maintain a no-ether theory consistent with relativity, while still implying, essentially, an ether. This is because all the terms used insinuate that a perfect vacuum contains something; therefore, it is not nothing.

They avoid the word ether, but this is what they are actually describing, not necessarily as defined by this article; nevertheless, something that occupies what is presumed to be the empty space (nothing). In essence, they are trying to bypass the extreme opposition of mainstream physics to use the term ether by calling it by another name.

For instance, the Higgs field (permeating all of space/universe) resists the acceleration by force of particles (fields). This is the definition and cause of inertia. Chapter 1 explained how this function relates to inertial mass and the rate of time, moreover, how given that assumption, one can explain the existence of the ether (the preferred frame for the velocity of light which is the classic definition of the ether). Therefore, the Higgs field is a part of the ether. See Chapter 1 for a full explanation.

So how does the existence of the ether relate to quantum mechanics? In fact, it is very easy to do so, as now presented. In the beginning, during and after the big bang, we start with the universe consisting of only the ether and absolutely nothing else.

Subsequently, within the ether, a wave then forms, called electromagnetic radiation (EMR). This is to some extent analogous to how waves form in motionless water. Next, EMR transforms into matter (particles) and vice versa. After that, matter coalesces to form stars and planets, etc. What is more, magnetic and electric fields are part of, and are derived from, the ether as well. In essence, everything, except for the ether itself, arises from the ether—quarks, gluons, mesons, etc.

Moreover, as it will be demonstrated later on within this chapter, the electro-chemical quantum nature of matter and energy are also a function of the ether—including all of life. Therefore, considering all of the above, as in the book of Genesis, this is essentially a story of creation.

Nonetheless, this theory does not answer the age-old question: From where does the ether originate, or framed in another way, where does the universe, or even more specifically, where do we come from? At present, that answer is unknowable absent the belief of an architect (creator). Presupposing there is, then the ether must be a creation of, or else is the creator. And so, conceivably with reference to the latter, we are a fractal of the maker.

The *Merriam-Webster Dictionary* defines a fractal as *any of various extremely irregular curves or shapes for which any suitably chosen part is similar in shape to a given larger or smaller part when magnified or reduced to the same size*.

Perhaps then, we are made in the semblance of God, a fractal of the whole with freewill. For those who believe in the Lord as this author does, the creator is the Lord of all that there is, even time. And so, assuming the Lord and the ether are one and the same, then this gives explanation for why, when we look out into the universe, it appears endless, because there is nothing else; that is all that there is.

By using the presupposition of the ether's existence as presented in chapters 1 (PFSRT) and 2 (PFGRT), one can easily mentally visualize the physical processes of the micro world as just described. In addition, one can comprehend them with analogies relevant to the real world. In contrast, regarding QM, it is difficult to make the invisible visible. This is because QM consists of complex mathematical equations that correlate input observation with output results. Even so, there is no logical pictorial understanding as to exactly how this process transpires.

Regardless, QM has great practical value, therefore, extremely profitable for business and industry. If one wishes to understand a basic primary drive for human behavior, then follow the money. As such, in all likelihood it will be extremely difficult to displace, what is more, overturn QM.

The Ptolemaic theory predicted the movement of the Sun and planets with great accuracy, and the author assumes it was used in its day to foretell the seasons, thus beneficial for determining when to plant crops. Later on, when the Copernican theory arrived along with Kepler's elliptical hypothesis, it produced identical results, however, also eventually resulting in a whole new world of Galilean physics—a tremendous advancement in science. Likewise, in

this author's opinion, if one perceives QM from the perspective of the ether, then entirely new scientific avenues will arise.

Obviously, there is only one overall universe encompassing both the macro universe (relativity) and the micro universe (QM). So, somehow, they must be interconnected. And how are they connected? By the ether. Understand this link, and as above, a new physics will arise, and with a new physics, new inventions, and with new inventions, profit, and eventually, with profit, recognition. However, as with all new paradigm-shift theories, until profit, most likely prior to acceptance, then extreme resistance.

Chapter 4 is the weakest chapter of the entire article for its foundation blocks are fashioned with sand. This is because QM's myriad number of subatomic particles and the four basic forces are extremely complicated. Therefore, with reference to the three dimensions, its functions are extremely difficult to visualize, moreover, explain. This weakness is also partially due to the author's paucity of knowledge regarding subatomic physics, as well as their interactions with one another. And then there's the author's lack of interest in this subject due to its complexity, for it is very difficult to visualize something that is fundamentally purely mathematical.

In addition, compared to the first three, this chapter is significantly fragmented and disjointed. Regarding those chapters, the pieces of the puzzle seamlessly fit together to form an overall picture. On the other hand, vis-à-vis this chapter, the pieces are still considerably scrambled, therefore, for the average reader more difficult to assemble into one overall easy-to-comprehend visual image. Principally, this chapter's diverse concepts do not integrate well with one another.

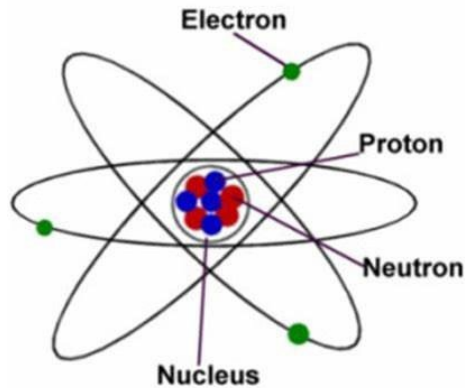
As already stated, this weakness is predominately due to the author's basic lack of understanding of QM. But then again, perhaps the author is not alone. For example, here again is a quote by the famous quantum physicist Richard Feynman, a Nobel laureate, supporting this notion, "If you think you understand QM, then you don't understand QM."

Nevertheless, the author has chosen to simplify the explanation as to how matter and energy are both functions of the ether (QM) by positing, first, a modified Bohr model of the atom, focusing somewhat on the electron, and, second, the dual particle/wave nature of light.

Before proceeding, it should be noted that the following descriptions and explanations are clearly too simple to characterize the true reality of the micro-universe. In addition, some of the concepts presented may not even be correct. Regardless, the primary goal by the author is to demonstrate to the reader a different way of thinking about and perceiving QM.

4.2 The Bohr Model of the Atom

In order to appreciate the modified Bohr model of the electron and understand exactly how it relates to the ether, here's a description of the classical Bohr model. Subsequent to that, the QM model will be presented and finally, an explanation of the new modified Bohr model, essentially an amalgamation of both. First, the Bohr model is depicted below in Figure 4.1.



Deeper into the Mystery of Matter – Electrons! (And more weirdness...) — Alex LeMay – Science

Figure 4.1 Bohr Model [Fair Use]

The Bohr model is analogous to our planetary solar system.

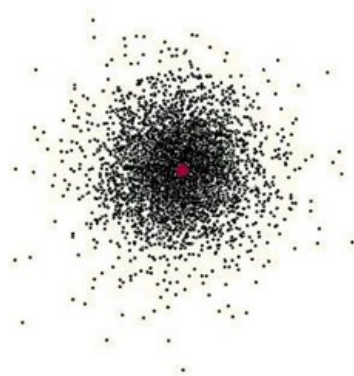
The Bohr model of the atom is to some extent comparable to our planetary solar system, whereby the central nucleus possesses a positive charge or charges (Sun), with the negatively charged point like electron particles orbiting it (planets). In addition, the orbital shells containing the electrons become increasing more volumetric the further from the nucleus. Again, this is, to some extent, similar to the layout of the solar system. However, in contrast to the solar system, there can exist more than one electron per orbital shell and the orbiting electrons are not planar. Furthermore, the energy state of the electrons becomes increasing greater the further from the nucleus, what is more, in discrete units called quanta. Take note, the Bohr model is reasonably easy to visually grasp.

The following website relates to the Bohr model of the atom. It is titled "The Bohr Atom."

<https://www.youtube.com/watch?v=GhAn8Q-d8>

4.3 The QM Model of the Atom

Figure 4.2 is the QM model of the electron.



commons.w.wikimedia.org

Figure 4.2 Single Electron Probability
A Single Hydrogen Atom (electron density model) [Fair Use]

The black dots are the electron cloud—the darker it is, the more likely the electron is there.

In contrast, the QM model of the atom is significantly more intricate. For that reason, the author has chosen to focus mainly on the electron, a fundamental particle of all theories of the atom.

In essence, QM posits that if one determines the exact location (position, vis-à-vis QM) of an orbiting electron, then one cannot calculate its precise velocity (momentum, vis-à-vis QM). And if one knows its precise velocity, then one cannot define its specific location. Fundamentally, it is impossible to know the electron's exact position and exact velocity simultaneously.

Even so, at any given point in time, one can calculate the probability of its location, as well as the probability of its velocity. Therefore, over a given interval of time, if one wishes to transform this concept into pictorial imagery, then surrounding the nucleus, the electron/electrons take on the form of a probability cloud, unlike the point-like particle concept of the Bohr model.

In addition, each of the elements is associated with different configurations of its probability cloud. The same concept also holds true for other subatomic particles. Nonetheless, this author does not have the knowledge, moreover, the desire, to explain them in detail.

For further clarification, the following websites relate to the QM model of the atom:

"Quantum Mechanical Model"

<https://www.youtube.com/watch?v=accyCUzasa0>

"Quantum Mechanics: The Structure of Atoms"

<https://www.youtube.com/watch?v=-YYBCNQnYNM>

"What Is Quantum Mechanics?"

<https://www.livescience.com/33816-quantum-mechanics-explanation.html>

Furthermore, QM also posits the superimposition concept, where light is both a wave and a particle at the same time and only differentiated when observed.

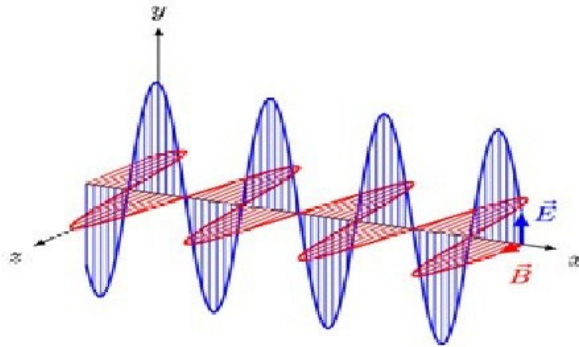
4.4 Modified Bohr Model

The modified Bohr model is also extremely complex; therefore, to simplify the explanation, the focus will again be directed mainly, but in this case, not entirely, on the electron. However, keep in mind that all of the subatomic structures can be perceived in the same way.

But first, before proceeding, there are 14 basic attributes that one must acknowledge in order to understand the new, modified Bohr model, moreover, its connection to the ether. These attributes are listed below.

One

Electromagnetic radiation (EMR) is a wave of the ether—to some extent analogous to how waves traverse through water. In addition, EMR consists of alternating right-angled electric and magnetic fields, traveling at (c) . (See Figure 4.3.) Furthermore, in one of its forms, it takes on the configuration of a given packet of energy, with a specific frequency, amplitude, and length, defined as a photon, a quantum.



Wikimedia Commons

Figure 4.3 EM Radiation [Fair Use]

Image shows alternating right-angled magnetic and electric fields. This, in association with its given length, frequency, and amplitude, is the photon.

Two

An electron (matter) is essentially a reorganization of the electric and magnetic fields of EMR. In other words, EMR's linear momentum traversing through the ether at (c) is converted into angular momentum. This is because it curls upon itself and spins. As a result, it then transforms into an electron, but now at rest or near rest with the ether. Additionally, the EMR's electric and magnetic fields rearrange to form a central radiating spherical electric field surrounded by a circular rotating magnetic field.

Furthermore, the plane of the circular magnetic field is oriented perpendicular relative to its motion through space or citing other terminology, the ether of PFSRT (Figure 4.4). Essentially, the electron at rest with the ether of PFSRT is only a spherical field; there is no particle. What is more, the field is the charge. For future reference regarding this chapter, generally although not exclusively, the terms electric field and electron are assumed to be synonymous.

Before proceeding, viewing the website given below from 0 min to 9 minutes 36 sec and 29 min 30 sec to 30 min 18 sec. will explain the classic interpretation of electromagnetism and

the electron. The author uses some of the concepts presented in the video to describe the new theory but now from the reference frame of the ether.

<https://www.youtube.com/watch?v=9Tm2c6NJH4Y>

The author now posits a more inclusive hypothesis from a different perspective; the electron intrinsically consists of only a spherical electrical field and nothing else. Now, as this spherical field traverses through the ether of PFSRT, it then distorts that ether to form a circular rotating magnetic field. Just as a boat produces waves as it travels through water, so too does the spherical electrical field (electron) distort the ether, as a function of its own velocity relative to that ether.

Fundamentally, the circular magnetic field is not an intrinsic property of the electron; rather, it is a distortion of the ether as a function of the electron's (field) motion through that ether. Additionally, as the velocity of the electron (field) increases linearly relative to the ether (PFSRT), the circular magnetic field increases by an LTF. Later on in this chapter, it will be explained how this concept correlates to inertia and inertial mass.

This attribute is extremely significant. Therefore, for the benefit of the nonscientist, the author will re-explain it with more detail.

The electron is only a spherical electric field, but as it plows through the ether, it distorts that ether; the distortion then is the magnetic field. This is somewhat similar to a boat plowing through water; it then distorts that water to form waves. However, the magnetic field and the water waves are only somewhat analogous. Therefore, in contrast to a boat where the water responds (resists) to both velocity and acceleration, the ether reacts (resists) only to the electron's acceleration. The resistance represents inertia and the inertial mass of the electron.

Basically, water's resistance increases exponentially with respect to a boat's velocity and acceleration; whereas the ether's resistance increases by an LTF as a product of only the electron's acceleration factor.

What is more, since there are two directions of electron magnetic field rotations, the spherical electrical field (electron) must also involve two forms as well. So, as one form plows through the ether, the ether then rotates in one direction (magnetic field). And when the other type plows through the ether, the ether rotates in the opposite direction (magnetic field). These two categories of directional rotating ether are, in effect, the two opposite types of rotating magnetic fields associated with the electron.

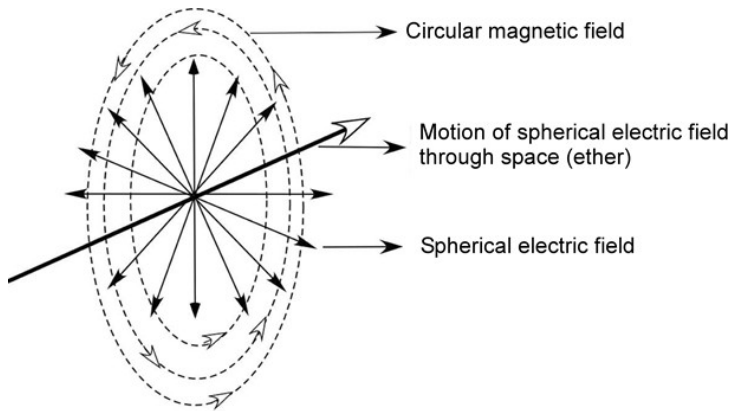


Figure 4.4 The Electron is not a Particle

The electron consists of only a spherical central radiating electrical field along with a circular magnetic field, the latter with its plane oriented perpendicular relative its motion through space (ether of PFSRT). There is no particle, only fields.

Three

EMR can transform into an electron (EMR into a spherical electric field electron) and vice versa. However, this only transpires as a function of a precise packet with a specific energy, in other words, a quantum. In addition, as a speculation, the direction of the spin of EMR (photon) could be related to the type of spin of the electron (e.g., up or down).

Four

The electron is not a particle with associated radiating fields; rather, the field or fields are the electron, just as EMR consist of only alternating fields. The notion of a particle is only a →false perception← which occurs when the fields, which are the electrons, then interact with the fields (electrons) of the measuring instrument. So, for that measuring device, this interaction then produces a quantum change in its orbital shell structure. Principally, the quantum interaction involving only fields located within the detector's electron shell structure is what is then perceived as a particle—but there is no particle, only interacting fields.

Five

A positron and an electron, both at rest relative to the PFSRT, can mutually annihilate one another, therefore producing two 0.511 MeV photons, which then travel in opposite directions at (c). Conversely, EMR at (c) can transform into an electron and a positron, at rest with the PFSRT.

Six

The electron possesses intrinsic spin, which is extremely rapid. This is because the photon's translational momentum at (c) then transforms into the electron's spin angular momentum, perhaps again at (c).

Seven

Electrons possess two forms of magnetic fields. The first is related to the electron's intrinsic spin within the ether (up/down). This is a function of EMR spinning upon itself, therefore,

transforming into an electron (electric field). The second is a function of the electron's velocity, with regard to the ether of PFSRT (Chapter 1). For future reference, these two categories of magnetic fields will be defined as: first, the spin electromagnet field (SMF), and second, the velocity magnetic field (VMF).

Eight

In addition, there are two opposite types of (SMFs-up/down), as well as two opposing rotating forms of VMFs. What is more, the two categories are interrelated. So, as one form of the electron's SMF (up) travels through the ether, the VMF rotates in the same direction as its SMF. And likewise, as the other form of the electron's SMF (down) traverses through the ether, the VMF rotates in the same direction as its SMF. However, compared to each other, the two types of SMF/VMFs are spinning/rotating in opposite directions.

It is also conceivable that the VMF is derived from and is an enlargement of the electron's SMF. This transpires when the electron with its associated SMF (up or down) travels at a velocity relative to the ether of PFSRT. So, when that occurs, the SMF enlarges to become the VMF.

In addition, it is also conceivable that photon spin, electron spin (SMF), and the VMF are all interrelated. For instance, when a photon curls upon itself and spins in one direction, this transformation produces an electron (field), moreover, possessing the same directional spin (SMF) as the originator photon. Furthermore, when that same electron then travels at a velocity relative to the ether of PFSRT, a rotating circular VMF forms, again oriented in the same direction.

Nine

An electric current located within a straight wire conductor induces a circular magnetic field surrounding the wire. Moreover, to some extent, the greater the coulombs or current, then the stronger the magnetic field, and the higher the voltage, the larger the magnetic field. (See figures 4.5 and 4.6 below). These two figures show the orientation of the circular magnetic field, induced by a current, located within a straight wire conductor.

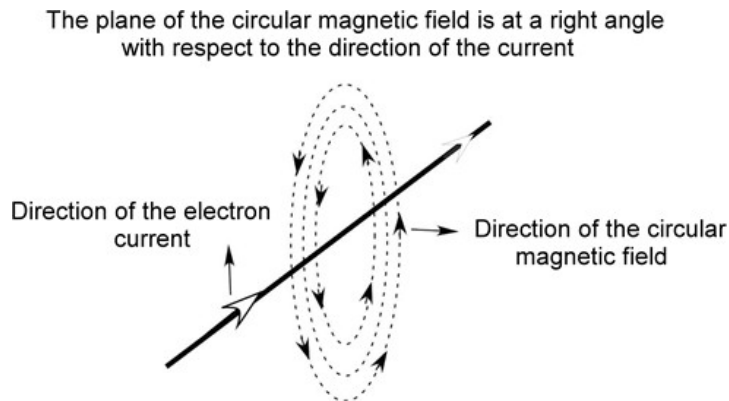
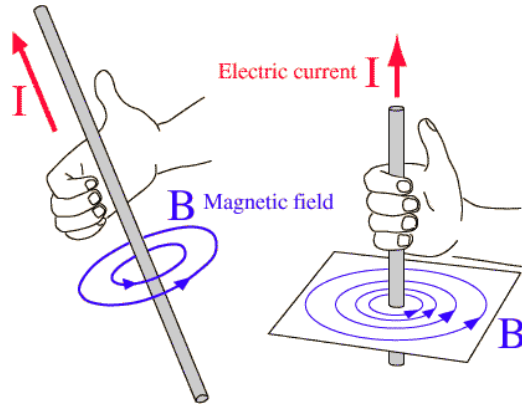


Figure 4.5 Electron Current with Magnetic Field

An electron current (charge) within a conductor produces a circular magnetic field, as shown above. Alternatively, for a positive charge current, the shape of the magnetic field is in the opposite circular orientation, as depicted below in Figure 4.6.

In reality, there is only an electron current. A positive current is not real, since a current only involves electrons. →The electron current is a net current since the electrons orbit the nuclei of the atoms of the conductor at an extremely high velocity but overall, travel from atom to atom along the conductor very slowly←.



www.electrical4u.com

Figure 4.6 Right-Hand Rule [Fair Use]

*Orientation of magnetic field relative to the **direction of the current (+ charge)**. An electron current would be the Left-Hand Rule (- charge), a mirror image of the Right-Hand Rule.*

For future reference, moreover, referring specifically to this chapter, only an electron current is deliberated, not a positive current.

Figure 4.7 below demonstrates that the typical circular magnetic field induced by an electron current is the summation of the magnetic field of each of its individual electrons. Observe, the sum total of all of the individual electron's magnetic fields as presented in Figure 4.7 is then the current's overall magnetic field as pictured in Figure 4.5.

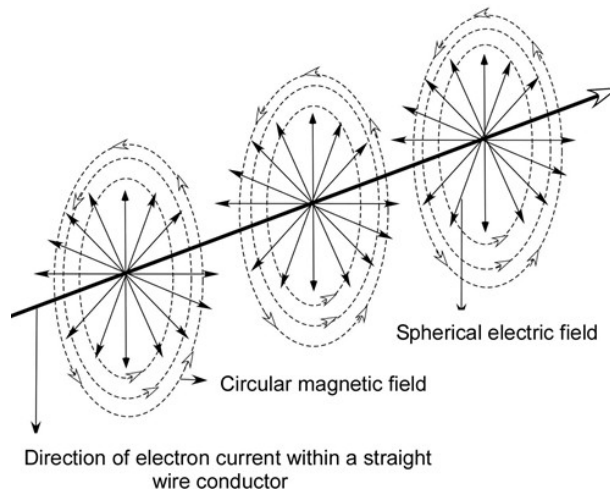


Figure 4.7 The Magnetic Fields of Individual Atoms of the Current

Referring to a single straight wire conductor with an electron current, the summation of the magnetic fields produced by each individual electron of that current then creates the classical circular-shaped magnetic field surrounding the wire.

Note, within the conductor, there is an equal number of electrons and protons. For that reason, there is no overall electric field, given that the opposite and equal electric fields neutralize one another. On the other hand, there is an overall magnetic field from the current, since the opposing, moreover, unequal magnetic fields, →do not counteract one another←.

Again, the velocity of the current within the conductor is a function of the voltage. Consequently, the higher the voltage, the greater then is the electron's velocity, and in turn, the larger the magnetic field. But the question is, velocity relative to what? The answer is relative to the ether of PFSRT/PFGRT.

See Appendix I for further clarification. A solitary electron at rest with the PFSRT consists of only an electric field with an associated SMF (spin). However, there is no (VMF), because by definition, it is at rest with the PFSRT. Alternately, when the electron possesses a velocity, relative to the PFSRT, a circular VMF then forms. In addition, as its velocity increases linearly, again relative to the ether of PFSRT, this field increases by an LTF.

Furthermore, the plane of the circular rotating magnetic field (VMF) is oriented perpendicular, with respect to the electron's motion through the PFSRT (ether). (See Figure 4.8 below.)

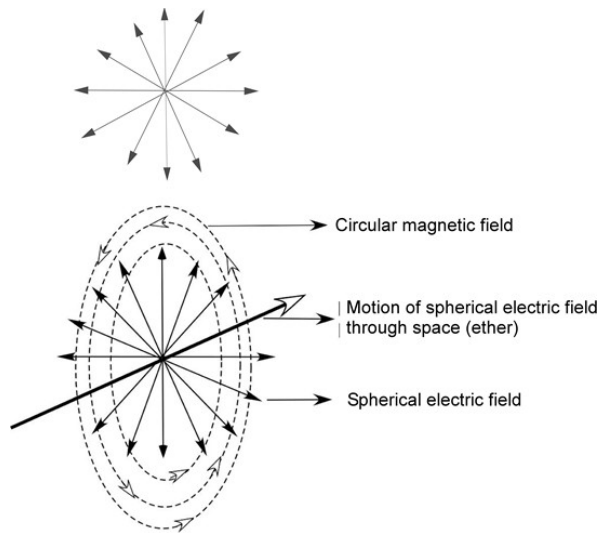


Figure 4.8 Plane of the Magnetic Field is Perpendicular to its Motion Relative to the Ether (PFSRT).

(Top) An electron at rest with the ether consists of only an electrical field with intrinsic spin (SMF).

(Bottom) However, when an electron travels at a velocity relative to the ether (PFSRT), it then forms a circular magnetic field (VMF), moreover, with its plane oriented perpendicular with respect to its motion, through the ether of PFSRT.

Ten

When an electron is accelerated relative to the PFSRT simultaneously, its VMF increases. Now, when the acceleration stops, the increased VMF persists, since the electron's velocity relative to the PFSRT remains. Essentially, the VMF is directly related to its relativistic inertial mass, for they are, in fact, one and the same.

In theory, a solitary electron at rest with PFSRT possesses no VMF; therefore, it has no inertial mass. And an electron at (c), with respect to the PFSRT, possesses an infinite VMF so an infinite relativistic inertial mass (LTF). You can now picture in your mind the rationale for why matter, including the electron, cannot be accelerated faster than the speed of light.

This new theory posits that relative to the ether, when the velocity of an electron increases linearly, its relativistic inertial mass then increases by an LT function. Similarly, with reference to the ether, this theory presumes, as the velocity of an electron increases linearly, then in the same way, its circular rotating magnetic field increases by an LT function. Take notice of the identical relationship. For this reason, the author postulates this theory: The electron's increased magnetic field (VMF) is what produces, and moreover, is the increased **relativistic** inertial mass. This is compared to its **rest** inertia mass, which occurs whenever the electron is at a 0 velocity with respect to the ether (no VMF).

Canadian physicist and professor Dr. Marmet's abstract proposing this hypothesis is given below.

Relativity theory gives a relationship predicting the increase of mass of relativistic moving particles, but no physical model has been given to describe the fundamental physical mechanism responsible for the formation of that additional mass. We show here that this additional

kinetic mass is explained by a well-known mechanism involving electromagnetic energy. This is demonstrated taking into account the magnetic field generated by a moving electric charge, calculated using the Biot-Savart equation.

We show that the mass of the energy of the induced magnetic field of a moving electron is always identical to the relativistic mass $M_0(g-1)$ deduced in Einstein's relativity. Therefore, the relativistic parameter can be calculated using electromagnetic theory. Also, we explain that in order to satisfy the equations of electromagnetic theory and the principle of energy and momentum conservation, toroidal vortices must be formed in the electric field of an accelerated electron. Those vortices are also simultaneously compatible with the magnetic field of the Lorentz force and the well-known de Broglie wave equation.

This leads to a physical description of the internal structure of the electron in motion, which is at the same time compatible with the Coulomb field, the de Broglie wavelength equation, mass-energy conservation, and the magnetic field predicted by electromagnetic theory. That realistic description is in complete agreement with all physical data and conventional logic. The paper concludes with an application, which is a first classical model of the photon, fully compatible with physical reality, without the conflicting dualistic wave-particle hypothesis.

This inertial mass proposal and quote were obtained from the article titled, "Fundamental Nature of Relativistic Mass and Magnetic Fields," authored by Paul Marmet, published in the International IFNA-ANS Journal *Problems of Nonlinear Analysis in Engineering Systems* No. 3 [19], Vol. 9, 2003 Kazan University, Kazan, Russia.

To recap, when an electron's velocity increases linearly with respect to the ether, the magnetic field (VMF) induced by this process increases by an LTF. And so, for that electron, this effect produces an increased resistance to its further acceleration by force = increased relativistic inertial mass. In essence, the electron's relativistic inertial mass is a function of its VMF. In turn, that magnetic field is a function of its velocity relative to the ether.

See Figure 4.9 below. If one presumes PFGRT assumptions to be valid, then the velocity factor of the inflowing ether at the Earth's surface is 11.2 km/sec. As a result, at the Earth's surface, there are no solitary electrons at rest with the PFGRT. We assume they are at rest relative to us, because we do not perceive the inflow of space (ether) with our five senses; moreover, we do not associate the concept of gravity with an inflowing space/ether.

Therefore, given the above, all solitary electrons on the Earth's surface possess a relativistic inertial mass as a function of their velocity with respect to the inflowing ether (11.2 km/sec).

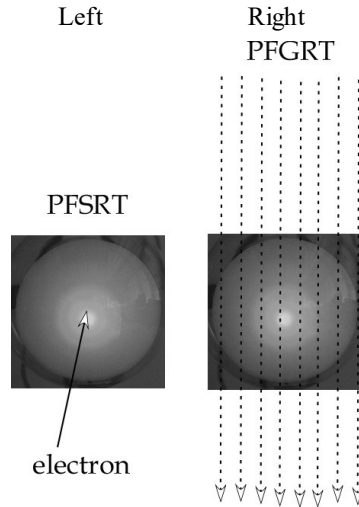


Figure 4.9 Electron at Rest vs. Electron Moving at the Earth's Surface

The image on the left is that of a solitary electron at rest with the ether (PFSRT). The image on the right depicts a solitary electron located on the surface of the Earth. For that reason, it possesses a relative velocity with respect to inflowing space (PFGRT) as symbolized by the hollow vertical dotted arrows. This relative velocity is equal to 11.2 km/sec, which corresponds to the velocity of the inflowing ether at the Earth's surface.

Eleven

An object, an association of atoms, is constructed from subatomic entities consisting of both positive and negative electric fields (protons and electrons). In addition, generally, there are about equal numbers of them. Consequently, these opposing electric fields negate one another. So, for that object, there is no overall electric charge.

In addition, assuming the object possesses a velocity relative to PFSRT/PFGRT (e.g., 0.5 c), there is then the production of VMFs (relativistic inertial mass) as a LTF. Now, within the object, there are an equal numbers of opposite VMFs derived from all the different subatomic entities (protons, electrons, etc.). Consequently, these opposing fields negate one another. For that reason, the object has no overall magnetic field, just as it has no overall electrical field.

Nevertheless, with respect to only the function of relativistic inertial mass, the sum total of all the VMFs, regardless of their opposing directions, do not cancel one another. Fundamentally, there are two functions. So, even though there is no overall magnetic field (function 1), the relativistic inertial mass of the object remains (function 2).

This description is rather abstract and for that reason, probably confusing especially for the novice. Therefore, it will now be re-explained from a slightly different perspective. Again, assume the object possesses a velocity relative to PFSRT. Typically, matter is constructed from an equal number of electrons and protons containing opposite electric fields. Therefore, they counteract one another. As a result, for that object, the overall electric field is null.

In addition, the object's protons and electrons are associated with unequal magnetic fields. Recall: The electron's magnetic field is significantly greater than the proton's field. Even so, within the atom, electrons and protons also possess identical opposing magnetic fields (VMF). So overall within the object, there are an equal number of opposite magnetic fields. As a

consequence, all these complex fields then negate one another. And for that reason, the object (matter) has no overall magnetic field.

Now, with respect to the ether, when an object (matter) is accelerated by force ($F = ma$, LSA), resulting in an increased velocity relative to that ether (e.g., $0.1c$ to $> 0.9c$) then its relativistic inertial mass increases by an LT function.

So, with respect to this new theory, by what means does this transpire? Here's how. While increasing its velocity relative to the ether, moreover, within the object, there is a symmetrical increase involving all of the counteracting opposite magnetic fields (VMF), produced by all of the subatomic units. And so, taken as a whole, even though this increase exists (the inertial mass increases), the opposing magnetic fields still counteract one another.

To be specific, for that object, there is no apparent overall magnetic field. Nevertheless, the remaining perception is an increase in its relativistic inertial mass.

Twelve

Generally, although not exclusively, electrons are not solitary entities; rather, they orbit a nucleus. Thus, while in orbit, they exist at a velocity with respect to the ether of PFSRT. As a result, a magnetic field forms. This is not their intrinsic revolving (spin) magnetic field (SMV), rather their (orbital) velocity magnetic field (VMF). And so, assuming an atom is overall at rest with the PFSRT, its orbiting electrons are not. (See Figure 4.10 below.) As a consequence, they produce VMFs.

If you really think about it, the overall rest inertial mass of an atom is actually a function of the relativistic inertial masses of all its rapidly orbiting subatomic entities. This is because as they orbit, they all possess a velocity relative to the PFSRT. And as a result, they also possess relativistic inertial masses. The sum total of all those subatomic relativistic masses is the rest inertial mass of the atom. Again, this is assuming the overall atom is at rest with the PFSRT.

See Figure 4.10 below and the captions for an expanded explanation of inertial mass.

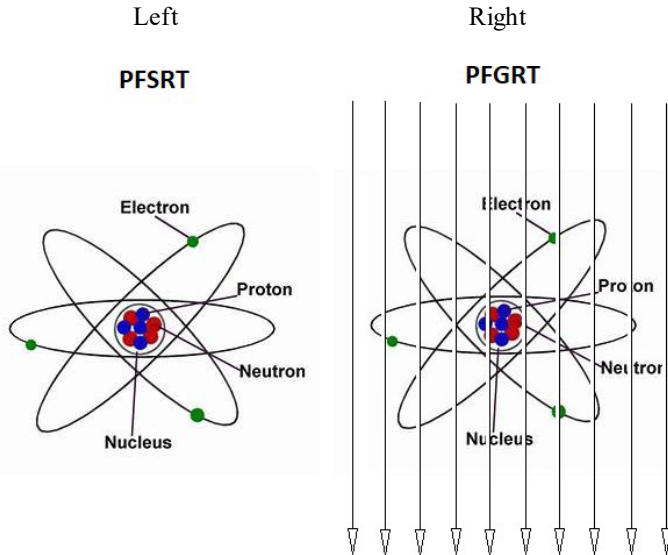


Figure 4.10 Expanded Explanation of Inertial Mass

1. The figure above focuses mainly on the electron. However, in the following captions, the ideas presented initially will then be expanded to encompass all the subatomic entities.
2. On the left, by definition, the overall atom is at rest with the ether (PFSRT); nevertheless, its orbiting electrons are not. For that reason, the velocity of each electron, relative to the ether of PFSRT, is equal to its own orbital velocity around the nucleus. Consequently, they all then possess relativistic inertial mass, and the sum total of the relativistic masses of all its electrons is the rest inertial mass of the atom.
3. On the right, the overall atom possesses a velocity relative to the inflowing ether (PFGRT) as symbolized by the downward vertical dotted arrows. In this setting, the velocity of each electron relative to the ether is equal to its own orbital velocity around the nucleus plus the velocity of the inflowing ether. So, in this case, the sum total of all the relativistic masses of all its electrons is now the relativistic inertial mass of the atom. The same effect holds true when an atom possesses a velocity relative to PFSRT.
4. The above description involves only electrons, which cannot account for the total inertial rest mass of the atom. So, let's now broaden the concept. Within the internal structure of the atom, all of the subatomic units (fields) in one form or another are in orbit, including quarks (protons neutrons—all fields). As for the later (nucleus), they all revolve around one another relative to a theoretical physical center-point—there is no particle, only revolving fields. Therefore, they all possess a velocity with respect to the ether of PFSRT/PFGRT. Consequently, for all these entities, as a function of their orbital velocities, they produce relativistic inertial masses, analogous to the electron model just presented.
5. In the case where the overall atom is at rest with the PFSRT, the sum total VMF of all orbiting entities produces for that atom its rest inertial mass as shown on the left side of Figure 4.10.
6. Alternatively, if the overall atom possesses a velocity with respect to the PFSRT/PFGRT, then again, the sum of the VMF of all the orbiting subatomic entities produces its relativistic inertial mass as shown on the right. Take note: The relativistic inertial mass (6) is greater than the rest inertial mass (5), because with reference to the former, all the subatomic entities possess a \rightarrow greater velocity relative to the ether (PFSRT/PFGRT) \leftarrow .

Thirteen

Einstein's equation of $E = mc^2$ posits that energy and matter are equivalent, moreover, interchangeable. Mathematically, this is straightforward. Nevertheless, it is very difficult to visualize how this actually transpires by using a nonmathematical physical mechanism. On the other hand, bearing in mind this new theory, it is fairly easy to envision vis-à-vis the electron (as an example).

Fundamentally, it involves two separate functions. The first is the transformation of electromagnetic *energy* (EMR) into subatomic particles (electron field). This process occurs as a function of a specific packet of *energy* (quantum), then producing the inertial rest mass of the electron, moreover, at a 0 velocity relative to the ether. Recall, the electron is only an electric spherical field of energy. This is of our simplified model.

The second process is, as the rest inertial mass of an electron increases its linear velocity with respect to the ether (PFSRT), its magnetic field (VMF) then increases by an LT function. In effect, the increased magnetic field, which is a gain *energy*, is the electron's relativistic inertial mass.

Bear in mind, regarding both scenarios, one can easily picture in your mind the actual physical mechanism whereby *energy* is related to the rest inertial mass, as well as the relativistic inertial mass of the electron, or in other lexicology, how $E = mc^2$.

Fourteen.

Electrons orbiting a nucleus are arranged in the form of a quantum shell configuration. In addition, moving from shell-to-shell outwards, away from the nucleus, they are associated with distinctly higher and higher energy levels. Furthermore, with respect to the different orbital shells, the electron's energy state is not continuous; rather, related to unique separate energy values. This indicates that relative to the ether of PFSRT, the outer shell electrons, when compared to the inner shell electrons, possess a higher velocity. For that reason, they are associated with a larger magnetic field and a greater relativistic inertial mass. As a result, one of the reasons the outer orbital shells are wider/more volumetric is that their VMFs are larger.

The New QM Modified Model

Now, by employing these basic 14 premises, the posited model of the modified Bohr atom is presented. Again, recall the definition of QM. "The branch of mechanics that deals with the mathematical description of the motion and interaction of subatomic particles, incorporating the concepts of quantization of energy, wave-particle duality, the uncertainty principle, and the correspondence principle." [Source: <http://bit.ly/2aDfolp>]

When reading the following three-dimensional descriptions, compare how those imageries correspond to the above definition, which is only based upon the complex mathematics of classic QM.

1. Within the atom, there are multiple attracting and repelling forces (fields). For example, electrons repel each other. Protons repel one another. Electrons attract protons. The opposite magnetic fields of the electrons attract one another. The same magnetic fields of the electron repel one another. The opposite magnetic fields of the protons attract each other. The same magnetic fields of the protons repel one another, and so on and so forth.

2. Matter is made up of only fields, which are actually forces. And as they interact, moreover, when they self-assemble into a stable equilibrium, this creates what is called an atom. In addition, there are only a specific number of stable equilibrium points, and each represents a single element. They are characterized by different configurations, e.g., circular vs. dumbbell shape, as classically illustrated in the literature and shown below in figures 4.11 and 4.12.

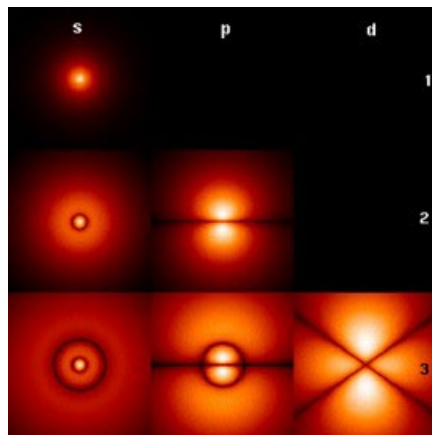
3. Nevertheless, some elements, while most of time stable, on rare occasions, as the fields interact, relative to one another, assume an unstable configuration. So in that setting, they disintegrate into other equilibrium points, photons, and fields (like the electron). This is known as radioactive decay.



Wikipedia

Figure 4.11 Examples of Different Cloud Patterns [Fair Use]

Some electron cloud patterns: hydrogen atom in lowest energy or ground state, hydrogen atom in an excited state, and carbon atom in ground state.



Wikipedia

Figure 4.12 Different Elements with Dissimilar Stable Equilibrium Points [Fair Use]

Fundamentally, different elements are associated with dissimilar stable equilibrium points which are depicted above.

4. At this juncture, let us describe what happens when EMR (a photon) interacts with an orbiting electron of atoms/molecules. Essentially, the EMR adds energy, or, in other words, orbital velocity, to that electron, both relative to its own nucleus and also with respect to the ether (PFSRT). After this interaction, if the electron’s increased orbital velocity is sufficient to achieve a new equilibrium configuration, then it jumps into the next outer shell.

What this signifies is that relative to the ether, the outer shell electrons possess a greater velocity/energy compared to the inner shell electrons, and as a result, a larger magnetic field. For that reason, and for that electron, there is then increased relativistic inertial mass. Moreover,

given that the outer shell electrons possess a larger magnetic field, then by necessity, the shells must progressively become wider/more volumetric the farther from the nucleus. Additionally, in general, there are more electrons per shell in the outer shells compared to the inner shells as a part of the equilibrium state. So this is a part of the equation as well.

Conversely, if an outer shell electron falls back into a lower inner shell with an ejection of a photon, its magnetic field/energy then decreases; as such, it gives up some of its relativistic inertial mass.

5. Fundamentally, an electron is purely an electric field with spin (SMF). In addition, it exists within, moreover, is a part of, the ether in the configuration of a volume, but more importantly, not a point-like particle. Theoretically, this field extends to infinity.

6. Furthermore, an electron, which is orbiting the nucleus, possesses extreme angular velocity. What is more, its velocity increases the further from the nucleus, both in respect to its own nucleus and to the ether of PFSRT.

7. The atom's different types of fields (forces) interact, moreover, travel, with respect to one another at extremely rapid rates. In fact, the process is so rapid that it cannot be accurately measured with our experimental equipment.

8. Since the electron's two fields have no precise location and given that they move too fast to accurately measure, then all one can do is mathematically calculate a probability of the electron's location and a probability of its velocity. Mathematically, one cannot simultaneously determine the exact position and the exact velocity (momentum) of the orbiting electron. This is Quantum Mechanics (QM)—the probability cloud.

9. What this model signifies is that the fields that make up matter, such as the electron, actually exist as three-dimensional entities. Nevertheless, in order to understand their function, we utilize the mathematics of QM. However, this mathematical skill does not describe their actual physical structures, or in the vernacular, what they actually look like.

10. This new QM model is analogous to, although not identical to, classic QM, for there are numerous similarities, as well as differences, some of which are described below.

10.1. With regard to QM, the specific properties (e.g., electron) are present only when observed (interact with other atoms/molecules/subatomic structures). Alternatively, with reference to this new theory, the properties are intrinsic to its own (e.g., electron) internal three-dimensional structure.

10.2. Unlike QM, the quanta of this new theory are all a function of the ether.

10.3. Assuming the new modified Bohr model actually portrays fact, then perhaps, classic QM is only a mathematical working representation of this reality. Nevertheless, QM does not depict actual physical structures or the visual mechanism of their interactions. In other words, even though QM accurately predicts outcomes, it does not precisely describe the actual physical shape of the atom, or, for that matter, EMR. Conceivably, this dichotomy is the reason why it is difficult to translate what is essentially the advanced mathematics of classic QM into words that actually make common sense.

10.4. The following quote reinforces this notion. *Just because we have a mathematical formulae that allows us to calculate and predict properties of an atom, this does not mean that the wave function is a mathematical description of the atom or worse still that the waveform is the atom.* ("Quantum A Guide for the Perplexed," pg. 80, by Jim Al-Khalili).

11. QM successfully predicts the outcome of particle physics and subatomic physics with extreme accuracy. In addition, it is the basis for countless successful modern-day inventions. Therefore, most likely, it describes the true "function" of the micro-world, nevertheless, strictly mathematically, not structurally or three-dimensionally. On the other hand, this new theory is a visual representation of that same micro-world of classic QM. Basically, both theories describe

the exact same process; one by math, the other pictorially. Therefore, presuming one could mathematically describe the new theory, the same cause and effect relationships would emerge. Presupposing this, then at that time, it would be equivalent to classic QM.

12. This new model is actually QM described in terms of a modified three-dimensional Bohr model of the atom. Fundamentally, it is a different way of perceiving QM. It is only presented as a new way of thinking, for obviously, protons, quarks, mesons, and gluons, etc. are not accounted for; therefore, this model is incomplete. In addition, there is no explanation for quantum entanglement.

The following list is presented for review, reinforcement, further elucidation, and from another perspective. This methodology is for the benefit of the novice, the primary intended recipient of this publication. In the author's opinion, repetition is the best technique for retained learning, especially if explained from different points of view.

Once again the definition of QM: *the branch of mechanics that deals with the mathematical description of the motion and interaction of subatomic particles, incorporating the concepts of quantization of energy, wave-particle duality, the uncertainty principle, and the correspondence principle.* (Quizlet, <http://bitly/2D3Nv0B>)

12.1. The vacuum of space is actually the ether; it is something, rather than nothing.

12.2. A wave forms in, moreover, is a part of the ether, somewhat analogous to waves developing in motionless water. This is defined as electromagnetic radiation (EMR) or photons.

12.3. Photons (EMR) can transform into subatomic particles (fields), such as the electron, and vice versa but only at specific energy levels (quanta).

12.4. The atom is constructed from multiple diverse fields (forces) bound together into a stable equilibrium. Essentially, the diverse interacting forces self-assemble into an atom.

12.5. Subatomic particles, such as the electron, are actually only purely fields which occupy a volume of space (ether); moreover, they are not point-like entities.

12.6. As a part of the atom, moreover, with reference to its equilibrium state, the electron orbits the nucleus at an extremely high velocity.

12.7. Therefore, given the limitations with our experimental measuring equipment, all we can do is calculate a probability of the electron's velocity (QM). And second, since it exists as a volume, not a point particle, all we can do is calculate only a probability of its location. As a result, together we perceive this as the probability cloud. Furthermore, given the same reasons mathematically, one cannot simultaneously determine the exact position and the exact velocity (momentum) of the orbiting electron = QM.

12.8. Different kinds of fields are essentially synonymous with various types of forces, such as the electric force.

12.9. The VMF of an electron is produced whenever it travels at a velocity with respect to ether of PFSRT. In addition, relative to the ether of PFSRT, the greater the linear velocity, then as an LTF, the greater is the magnetic field. This field (VMF) is its relativistic inertial mass. Furthermore, the plane of the VMF orients at a right angle with regard to its motion through the ether of PFSRT.

12.10. As a corollary, even though an overall atom is at rest with the PFSRT, since its electrons rapidly orbit that nucleus, then with respect to the ether of PFSRT, they travel at an extremely high velocity. For that reason, they possess relativistic inertial masses.

12.11. The rest inertial mass of an atom is the summation of the relativistic inertial masses of all its subatomic orbiting entities not just the electrons.

12.12. Some atoms maintain a persistent equilibrium state. Therefore, they are stable. Other atoms are stable most of the time, but rarely over time, as the fields interact, the overall configuration assumes an unstable form. Thus, the atom breaks apart to form other particles (fields), waves, and other equilibrium stabilization points. This is defined as radioactive decay.

12.13. The transformation from one equilibrium state to another is a function of quantum interactions. What is more, all of the interactions are a function of the ether.

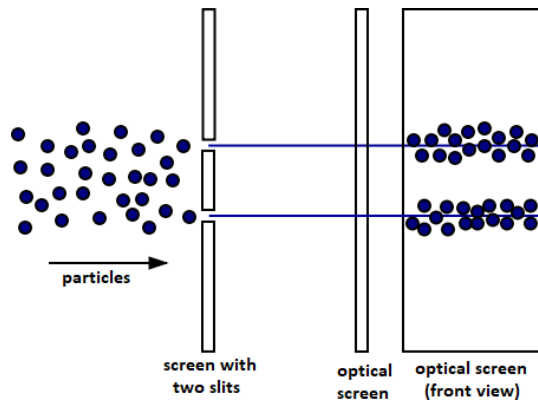
12.14. For other elements, the equilibrium configuration is intrinsically unstable. So, in that setting, the atom, in some cases, decays very rapidly and somewhat slower in other instances.

12.15. Given the presupposition that atoms are equilibrium states of interacting fields, this effect then explains the quantum nature of matter and energy. For example, to move an electron from one shell to another (different equilibrium states) requires a loss or gain of a specific discrete amount of energy or quanta. In this case, it is either an emitted or absorbed quantum (e.g., photon). All chemical reactions are, in fact, changes in atoms and/or molecules from one form of equilibrium configuration into another. Moreover, this process occurs with reference to discrete energy units. So, without the quantum nature of the ether of the universe, atoms and molecules would not even exist. The equilibrium states of matter and energy, moreover, their quantum interactional nature, produce all of the electrochemical interactions, including life.

12.16. Therefore, considering all of the above, the quantum nature of matter and energy are a function of the ether.

4.5 The Dual Nature of Light

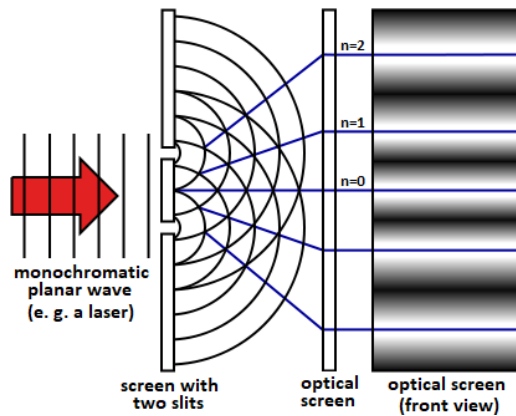
Figures 4.13 and 4.14 are pictorial representations of two postulated forms of light: the particle nature of light, and the waveform of light, together known as the dual nature of light. The figures below depict the quandary of the double slit experiment.



Wikipedia

Figure 4.13 Particle Nature of Light [Fair Use]

Figure 4.13 depicts an incident beam of particles being divided by the double slit into two separate beams of particles which then travel to the detector.



Wikimedia Commons

Figure 4.14 Waveform Nature of Light [Fair Use]

Figure 4.14 demonstrates a single wave of light being divided by the two slits, then transforming into two separate waves, which at the location of the detector, subsequently interact with one other to produce an interference pattern.

Both of the above figures (4.13 and 4.14) depict the outcome of the double slit experiment, one with reference to the particle nature of light, while the other with respect to the wave nature of light.

Figure 4.13 depicts the particle nature, whereas Figure 4.14 demonstrates the waveform of light. However, the particle concept of light is incorrect for the following reason as now presented. A photon consists of a wave of alternating fields of the ether with a frequency, amplitude, and a discrete length. But most importantly, it is not a point-like particle. In addition, a photon is only considered a particle, because it produces, in a shell of a detector, a quantum jump of an electron (a field) into a higher energy shell. Essentially, the particle nature of light is due to the fact that our measuring sticks, the instruments of detection, function on the basis of only quanta.

For that reason, we define this detection process (quantum interaction) involving a wave of alternating fields (photon) interacting with a field (electron) in a shell of a detector, as a particle. The function just described above is shown below in Figure 4.15 (left). Even so, the particle/waveform concept of light is more complicated than this, as will be clarified in the following paragraphs.

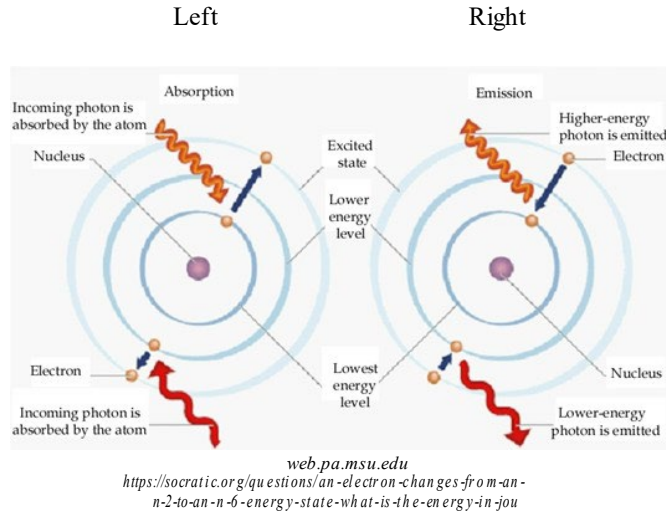
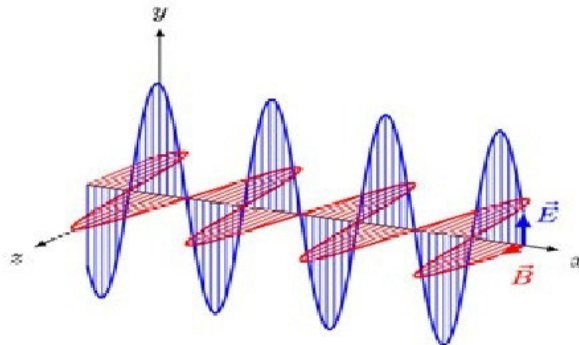


Figure 4.15 Absorption and Emission of Light [Fair Use]

Observe on the left, the photon (a wave of alternating fields with a beginning and end) displaces an electron (field) from a middle shell into an outer shell of the detector. This interaction is then perceived as the particle nature of light. The image to the right depicts the reverse function with the production of a photon.



Wikipedia

Figure 4.16 Repeat of Figure 4.3 [Fair Use]

Image shows alternating right-angled magnetic and electric fields. This, in association with its given length, frequency, and amplitude, is the photon.

So as illustrated above, these quantum interactions involving photons and an electron, are perceived as a particle. →However, in reality, they are actually waves of alternating fields (photon) of the ether, interacting with a field (electron) of the detector.← In effect, there is no particle, only fields.

See Figure 4.17 below. There is another aspect to consider. If an electron continually vibrates within the ether, it then produces a continuous wave of the ether called EMR. This is perceived as the waveform of light, not a particle or photon.



Wikimedia Commons

Figure 4.17 Wave Form of Light [Fair Use]

Figure 4.17 depicts continuous streams of waves of electromagnetic radiation within the ether. This function is perceived as the waveform of light as opposed to Figure 4.16.

Considering all of the above, this gives explanation to the double slit, wave vs. particle experiment, as now presented. The imaging instrument or, in other words, our measuring stick, only detects →photons/contiguous waves← with enough energy (frequency) to cause an electron (field) of the detector to then jump into a higher-energy shell, a different equilibrium state. This is the reason why it is detected.

See Figure 4.5 below. Now, in the setting with only one slit (left), there is no interference pattern. This is because after the single light beam (a field of alternating waves) passes through the one slit, it is still only a single alternating field. So, at the location of the detector, if the photon/continuous wave possesses enough energy the electrons (fields) of the detector respond with a quantum jump (higher-energy shell), relative to a single point of brightness. This single point is perceived as the particle nature of light.

On the other hand, with reference to a double slit (right), the original single beam, given that it is a field of waves existing over an area/volume and not a point particle, then passes through both slits simultaneously.

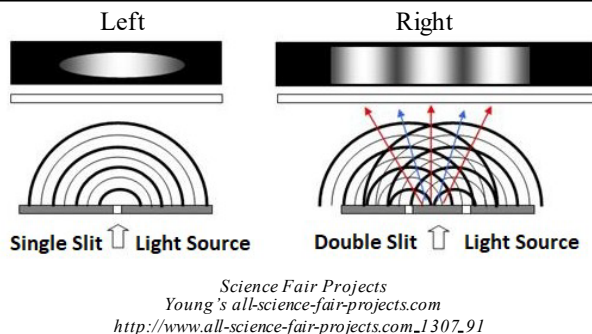


Figure 4.18 Single and Double Slit Experiments [Fair Use]

By doing so, it then divides into two separate streams. Subsequently, at the site of the detector, they interact with each other to form an interference pattern. Where there is enough energy to affect a quantum jump of an electron, the detector surface turns bright and where there is not, it remains dark. This interference pattern formed at the detector's surface is typical of what is assumed to be a wave. So, we then call this pattern the wave nature of light.

First, our misconception belies the fact that the detector only reacts to quanta. So, with regard to a single slit, a particle is perceived, because all the quantum interactions occur at one location. However, with a double slit, a wave is presumed, because the quantum interactions at the detector surface are a function of an interference pattern. Second, our bewilderment is also the product of a lack of a clear understanding that light (fields) can possess different lengths within the ether. Thus, if it has a discrete length, it is perceived as a photon or particle. Alternatively, if it possesses a continuous length, it is then perceived as a wave. Both of the above misunderstandings, in combination, result in our confusion.

To summarize, in reality, light (EMR) exists as a wave of alternating fields, either continuous or with a discrete length (photon). There is no particle in the classic sense. If you really think about it, fundamentally, everything in the universe is either a field of the ether (e.g., electron, proton, etc.), a wave of fields of the ether (e.g., light or EMR), or the ether itself. There is nothing else.

So light does not exist as a superimposed quantum state of both a particle and a wave. Our measuring sticks, the instruments of detection, determine the perception of a particle or wave.

Schrodinger's cat example refutes QM's concept of the superimposition of subatomic entities until they are observed. This new theory validates Schrodinger's analysis. See numbers 15–18, section 4.6.

Again, the new theory hypothesizes that it is the only the measuring device, as a function of quantum interactions, that determines whether or not the fields of EMR are →perceived← as a particle or a wave.

4.6 Conclusion

Again, for reference, the following is the classic definition of QM.

The branch of mechanics that deals with the mathematical description of the motion and interaction of subatomic particles, incorporating the concepts of:

- Quantization of energy
- Wave-particle duality
- The uncertainty principle

- The correspondence principle

In summary, regarding the entire chapter, as portrayed below are analogous three-dimensional alternative descriptions of the processes that are usually associated with classic QM. Compare how they are similar to, although not identical to, QM.

1. The origin of the ether is unknown, perhaps unknowable, without the presumption of a creator.
2. The ether is the essential, basic building block of all that there is.
3. A wave then forms, within ether, which travels at (c), defined as EMR.
4. EMR, a wave of the ether, instead of traveling through itself (ether) at (c), subsequently spins upon itself, to form an electric field (force) with intrinsic spin (SMF), then defined as a particle (e.g., field, electron). This transformation occurs at specific energy levels (quanta). (*Quantization of Energy*)
5. An electron at rest with the ether exists as only a spherical electric field with an intrinsic magnetic field spin (SMF). Additionally, there are two forms of opposite (SMF up and down).
6. An electron (field) with spin (SMF), possessing a velocity relative to the ether of PFSRT then produces a velocity magnetic field (VMF). Moreover, as the electron's velocity increases linearly relative to the PFSRT, then the VMF increases as an LTF. In addition, the VMF represents or is its relativistic inertial mass. Furthermore, the velocity magnetic field's plane orients perpendicular relative to its motion through the space of PFSRT. What is more, there are two forms of opposite VMFs and two types of opposing SMFs.
7. Different types of fields/forces (electric fields, magnetic fields, etc.) interact with one another to self-assemble into a number of stable equilibrium points, thus creating the elements and on larger scale, molecules. (*Quantization of Energy*)
8. In essence, everything in the universe is either a wave of fields of the ether (EMR), a field of the ether (e.g., electron), or the ether itself. There is nothing else.
9. The equilibrium configurations of different elements and molecules are associated with diverse specific discrete energy levels. As a result, chemical interactions take place in quantum jumps from one equilibrium state into another, moreover, with a concurrent consumption or production of energy (fields). The quantum equilibrium interaction of fields (particles) and EMR is what holds matter together; furthermore, it produces all chemical reactions. It is QM. (*Quantization of Energy*)
10. This new quantum theory is consistent with the principle of correspondence, for it is based on three-dimensional space (ether) just like PFSRT and PFGRT. (*The Correspondence Principle*)
11. QM uses mathematical probability curves for describing an electron orbiting an atom. Then again, this new theory assumes that the electron (field) exists as a volume, rather than a point source. In addition, it moves too fast to accurately measure with our experimental equipment. Therefore, integrated over a short period of time, it forms a cloud-like pattern surrounding the nucleus. So, with reference to the electron, this three-dimensional time integrated "cloud-like pattern" corresponds to the probability curve of QM. In other words, QM is a mathematical theory, whereas this new theory is visual; nevertheless, they are equivalent. (*The Uncertainty Principle*)
12. Alternately stated, atoms are constructed from only fields, a actual three-dimensional structures, which then interact with each other in an extremely-extremely rapid and convoluted manner (e.g., the formation of atoms). In fact, it is so complex that one cannot even envision it. Accordingly, in this context, it is then virtually impossible to employ the classic ideas of physics to describe this confusing/multifaceted function. Fundamentally, it is too difficult to do. On the other hand, by using only the equations of QM, we are able at least cursorily to do

so. The error in our reasoning is this: The complex mathematics of QM is the only way that one can superficially understand/explain what, in fact, happens at the atomic/subatomic level; correct input observations vs. output results even though one cannot visualize the underlying process by the use of those complicated mathematics.

Essentially the equations of QM do not represent the true three-dimensional actuality of what is really going on. Nonetheless, we presuppose in erratum that those equations of QM epitomize true realism, which when applied to the macro-world then makes no logical sense. As an analogy, as presented in the onset of this book, the Ptolemaic theory described the correct function of the solar system (only using mathematics and geometry) and was beneficial, the author assumes, for determining when to plant crops (very useful), but it did not represent true realism which is the Copernican/Kepler theory. So it is with QM; it describes the function of the subatomic world correctly (very useful) with mathematics alone, but not the true visual reality of that subatomic world (three-dimensions)←.

13. Light is fundamentally only a wave of the ether, but when it interacts with a measuring device (field), it does so in quanta, then assumed in erratum to be a particle. Additionally, the assumed particle nature of light is a function of the quantum nature of the measuring device. (*Wave-Particle Duality*). *There is no particle, only fields.*

14. There is only one universe that we know of; therefore, the macro world (relativity) and the micro-world (QM) must somehow interconnect. At present, QM and relativity are mathematically distinct from one another. However, the existence of the ether can tie them together, initially visually as demonstrated by this paper, and eventually with time by rigorous mathematical proof. (*The Correspondence Principle*)

15. Pertaining to QM, by utilizing purely mathematical equations, one can obtain correct outcomes. However, other interrelationships could be overlooked, furthermore, observed contradictions are often ignored.

16. Given below is a website containing a discussion and video of the Schrodinger's cat hypothesis where he demonstrated that—QM's assumption of the dual nature of an atom's state of radioactive decay vs. not decay (superimposition) until observed is not realistic, moreover absurd.

<http://whatis.techtarget.com/definition/Schrodinger's-cat>

17. Bear in mind, regarding this new theory, there is no superimposition as presented below.

18. Alternatively, referring to this new modified Bohr theory, atomic decay is basically a function of the equilibrium of fields, then called an atom. Now for some elements, randomly over a period of time, as all of the subatomic structures orbit one other, then each atom of that element rarely assumes an unstable configuration. When this occurs, that atom then ejects a photon(s) (fields) or particle(s) (fields), and simultaneously reassembles to form a new equilibrium state(s). Consequently when given a large conglomeration of these atoms, in the form of matter, this random function produces continuous radioactive decay in the form of a probability curve at a specific "rate of time" or half-life.

19. Here is the key concept. This new theory presumes radioactive decay is a product of actual three-dimensional structures, which are only fields, moreover, ultimately derived from the ether. What is more, as just presented, it posits radioactive decay is not a function of the dual nature of subatomic entities or what is called superimposition.

20. QM is only a mathematical representation of three-dimensional interacting fields, but even so, it cannot picture how this actually occurs.

21. QM has been so successful in predicting outcomes that it will be extremely difficult to overturn. Nevertheless, the major advantage with reference to this new theory is this: If one can visually perceive in three-dimensions the actual cause and effect of relationships of

the micro-world, then one ought to be able to conceive new and novel ideas, moreover, create new inventions never before contemplated.

22. The author acknowledges that mathematics has been given a bum rap with reference to this article, undeservingly so. Part of the problem lies in the fact that unless one has the overall big picture of the true physics of the universe, true reality is then difficult to discern. So, with regard to modern-day physics, in the face of confusing observations and disparate experiments, along with their associated complex math, which cannot be merged, reality is then disregarded, so long as the math employed produces correct conclusions for specific and limited applications, especially if profitable.

23. If the overall big picture of the physics of the universe remains unknown, then the pure mathematics of physics becomes paramount, what is more, the main focus. Those results often are nonsensical (not representing reality), even so still ignored. In addition, in the author's opinion, it is very difficult for many physicists to describe their theories utilizing only words and imagery. It is far easier for them to explain them by employing math, which is often not reconcilable with the real world, even though the input-output results are correct. However, if and when the overall big picture is eventually revealed, a new physics and its interrelationships supported by mathematics will be thrust upon the world.

24. The author's description of the micro-world is obviously deficient. For instance, the three-dimensional configuration of the photon must be different than postulated, since photon spin and light polarization are not taken into account; furthermore, quantum entanglement remains an enigma.

25. And so, one main objective of the chapter is to alter the perception of what is/are EMR, electrons, protons, mesons, quarks, etc. They are, in fact, three-dimensional structures/fields. Therefore, in the author's opinion, if one knows what they actually look like spatially, then even for the average individual, this hidden micro world will, at that time, be understood. In other words, the invisible mathematical functions of (QM) will then transform into the visible interactions of three-dimensional structures, therefore, easily comprehensible for all.

26. For example, as an analogy, without foreknowledge about the three-dimensional configuration of an enzyme, it is almost impossible to picture its physical mechanism of action, even though the beginning and end results are known. Alternatively, if one can envisage its 3D contour, then its functions, moreover, its interactions, are decipherable. This analogy is a fact, and so, for industry, profits have then ensued. In the author's opinion, the same philosophy should hold true relevant to the micro-world of QM.

27. The most important concept to take home is this chapter/book posits that the big picture of reality is PFSRT/PFGRT, with its presumption of the ether, which then can be merged with the assumed ether of the modified QM theory to fashion one overall unified theory for everything (TOE). This last presupposition is the main thrust and focus of Chapter 4.

28. This chapter leaves a lot to be desired, but, perhaps, the ideas presented here within will point the scientific community to a new and correct direction. Hopefully, the author has provided the framework so the scientific community can then finish the building.

29. **Regardless of whether or not anything else posited in this chapter is valid, the bridging of relativity with QM, both as a function of the ether, is the main concept the reader should consider.**

4.7 Epilogue

Given the concepts as presented in chapters 1, 2, and 4 consider the following.

Assume the reality of the ether. Next presume that the ether gave rise to a wave, as water waves are to water, defined as electromagnetic radiation (EMR). Subsequently, presuppose

EMR at times can spin upon itself to form charged particles (fields). After that, posit that those charged particles, as part of an equilibrium state, on occasion can self-assemble to create atoms, molecules, matter, planets, stars, etc. Observe, all of that described above is a function of motion/movement (spin, velocity, orbit/vibrations), what is more motion is actually time (see Chapter 1, section 1.4, page 7). Accordingly in the beginning when the Creator →set in motion← (formed) all of the physical universe from the ether, so too did time simultaneously come into existence.

CHAPTER 5

EXPERIMENTAL AND OBSERVATIONAL PROOF OF THE ETHER

Chapter 5 is divided into seven subdivisions.

- 5.1 Introduction
- 5.2 The Inflow of the Accelerating Ether
 - 5.2.1 The Moon Io
 - 5.2.2 The Pendulum Drive is Superior to the Kinetic Drive
 - 5.2.3 The Rotating Wheel with Buckets and Pistons
 - 5.2.4 The Ferris Wheel
- 5.3 The Homopolar Generator and Homopolar Motor
 - 5.3.1 The Homopolar Generator
 - 5.3.2 The Homopolar Motor
- 5.4 Electromagnetic Propulsion without a Propellant
 - 5.4.1 Propulsion from the Rectangle.
 - 5.4.2 Propulsion of the Railgun; a Hypothetical Presentation of the Theory
 - 5.4.3 Propulsion of the Railgun; a Practical Device
 - 5.4.4 Propulsion of the Ring
- 5.5 The Permanent Magnetic Motors
 - 5.5.1 The Merging of Electromagnetism with Permanent Magnetism
 - 5.5.2 The Circular Permanent Magnetic Motor
 - 5.5.3 The Shielded Permanent Magnetic Motor
- 5.6 Gyroscopes as a Function of PFGRT
- 5.7 Conclusion

5.1 Introduction

Presuming **the ether** exists, then the entire macro/micro universe is a function of that ether. And if so, then by logic, modern-day physics, including the irrefutable laws of physics, must be totally revised, moreover, rewritten.

In order to have any credibility, all accepted theories require confirmation/validation by experimental and/or observational evidence. Otherwise, they remain only theories, and over time they fade from human consciousness. Listed below in sections 5.2 through 5.7 are the evidence/observations confirming the reality of the ether.

5.2 The Inflow of the Accelerating Ether

- 5.2.1 The Moon Io
- 5.2.2 The Pendulum Drive is Superior to the Kinetic Drive
- 5.2.3 The Rotating Wheel with Buckets and Pistons
- 5.2.4 The Ferris Wheel

5.2.1 The Moon Io

See Figure 5.1. Recall Io is the closest moon to Jupiter. The inflowing ether (PFGRT), or articulated in classic terminology, the gravitational field produced by Jupiter, is angled inwards towards its own central mass. Therefore, as Io orbits Jupiter, then between perigee and apogee, this function sequentially and continually squeezes, as well as stretches, that moon then defined as tidal forces. This effect produces heat from internal friction, and in turn, on Io, continuous volcanic activity.

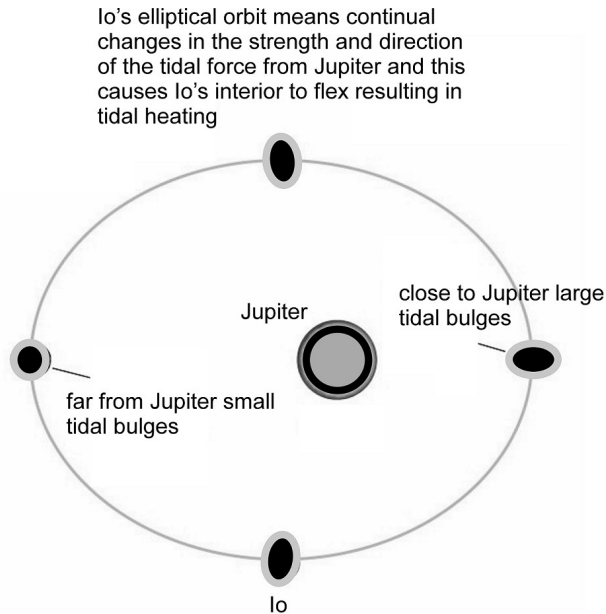


Figure 5.1 Io Orbiting Jupiter

The question is: From where does the energy that produces that volcanic activity ultimately originate? If one acknowledges the classic law of conservation of energy as valid, then it must be borrowed from somewhere. Notice, with the use of the classic laws of physics, it is not really apparent from where.

In other words, while orbiting between perigee to apogee, if Io's volcanic activity (force/energy) is ultimately a function of differential geodesic motion (inertial) from one of its sides compared its other side (4D-ST), then in order to be compatible with the law of conservation of energy, where does the force/energy come from? Again, it must be borrowed from somewhere, but where?

Viewed from another perspective, if the volcanic activity on Io represents a gain of energy, then by what mechanism does curved space-time (4D-ST) give up that same amount of energy? It is not as obvious as how.

Alternatively, if one presupposes the inflowing ether theory, somewhat analogous to how water flows into a sink or from a dam, there is a continuous, moreover, endless resupply of **accelerating** inflowing space. As a result, there is unlimited energy for the production of tidal forces, friction, heat, and ultimately, volcanic activity.

In the literature, with reference to Jupiter and its orbiting moons, other theories are posited, such as multiple, competing, and interacting gravitational forces, generating resonance. However, if this postulate were true, then the orbital radial of the interacting moons should decay over time, for a gain, energy must be borrowed from somewhere. If so, then over the time span of billions of years, one would expect that the inner moons would fall into Jupiter, thus cease to exist. But no orbital decay of Io has ever been observed. Even so, these alternate theories are still possible. Regardless, the crucial concept to recognize is this: the **Inflowing Ether Theory (PFGRT)** can also account for the production of Io's tidal forces, with its associated volcanic activity.

As a corollary, furthermore, to some extent comparable to the above example, Jupiter self illuminates. It is brighter than expected presupposing that the light from Jupiter observed by astronomers represents only the Sun's reflected light. If one quotes the literature, supposedly, this extra brightness is a product of Jupiter's gravitational field. Basically, the gravitational field causes the planet to very gradually shrink over time (eons), thereby generating excess light. In addition, other concepts are posited such as low-level nuclear reactions. Nevertheless, this contraction has not been confirmed; furthermore, none of the other theories have ever been substantiated.

Alternatively, if one presumes a continuous inflow of space (ether) into Jupiter (PFGRT), then the excess light could be a product of that inflow. Again, as hypothesized in the example of Io, PFGRT is only one of the theoretical possibilities.

5.2.2 The Pendulum Drive is Superior to the Kinetic Drive

Potential Energy to Kinetic Energy, Veljko Milkovic.

Please refer to this website:

<https://www.youtube.com/watch?v=N-JKa4Bexz0>

To begin, please refer to the website video as shown. Take note, in order to understand this experiment, it is much easier to observe it on video rather than imagine it from a detailed written description.

The above YouTube video demonstrates that a pendulum drive (PD) is highly superior to a kinetic energy drive (KD). The outcome of this experiment is self-evident. Nevertheless, it is inexplicable, vis-à-vis accepted laws of modern physics.

The following two figures, 5.2 and 5.3, are representative of that YouTube video. Please now review those two figures. Each is followed by a discussion. Notice, relevant to figures 5.2 and 5.3, the distance (D = black arrow length) traveled by the PD is significantly greater compared to that of the KD.

Considering modern physics, theoretically, in order to propel the cart forward, the only energy available for both experiments (KD and PD) is approximately the same amount of gravitational potential energy (GPE), because both experiments initiate their "fall of the ball" vs. the "pendulum motion" at the same height above the Earth. Nevertheless, the cart travels a significantly greater distance using the PD compared to the KD (three times as far).

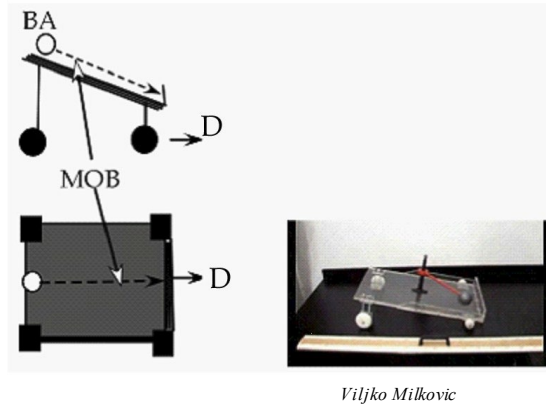


Figure 5.2 Kinetic Drive (KD) [Fair Use]

- *BA = ball*
- *MOB = motion of ball*
- *D = distance = length of arrow = distance traveled*

The ball (BA) "falls" on the angled platform, moreover, strikes its base, located at the bottom. This is a onetime event. Therefore, as a function of this single occurrence, forward propulsion from force is exerted on the cart. As such, the cart travels a given distance, denoted by the black arrow labeled D. Take note: the kinetic drive (KD) distance traveled is significantly less in Figure 5.2 compared to the pendulum drive (PD) distance, the latter shown below in Figure 5.3.

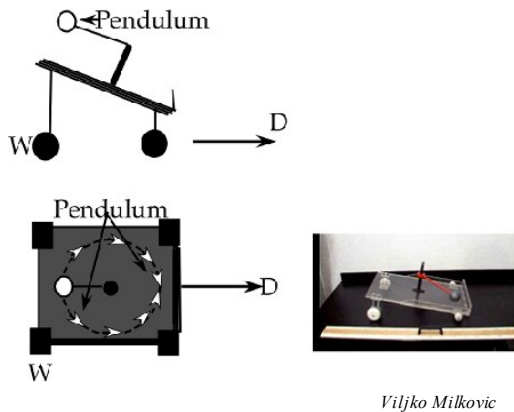


Figure 5.3 Pendulum Drive (PD) [Fair Use]

- *P = pendulum*
- *M = pendulum motion*
- *W = wheel*
- *D = distance is length of arrow = distance traveled*
- *MOB = pendulum motion of ball*

The pendulum with the same ball swings (falls) back and forth numerous times. And for each and every occasion, there is forward propulsion from force exerted on the cart. As a result, the cart travels a given distance represented by the length of the straight black arrow labeled D. The total distance traveled as a function the PD (Figure 5.3) is significantly greater compared to the kinetic drive (KD) distance (D), the latter as shown in Figure 5.2.

In addition, the PD must be that of over unity. The rationale for why is as follows, vis-à-vis both experiments: (GPE) is converted into the kinetic energy (KE), which is what is used to propel the cart forward. So again, regarding both scenarios, given that the ball-(KD) and pendulum-(PD) initiate their "fall" at the same height above the Earth's surface, then the maximum GPE available for conversion to KE is identical. Nevertheless, the PD travels a significantly greater distance compared to the KD, in fact, is three times as far.

Referring to the PD, as the pendulum swings back and forth, GPE is converted into KE and then taken back, moreover, a gain converted to KE and once again taken back, and so on and so forth. Observe, each time the cart moves forward, as a function of the pendulum's back-and-forth oscillation, it then loses some of its original height above the Earth until it eventually stops. In contrast, with reference to the KD, this is a one-time event.

Here is the crucial concept to acknowledge: this one-time (KD) event represents the conversion of the maximum available GPE into the maximum possible KE. In effect, there is no other energy accessible. Consequently, by logic, the maximum KE obtained by the KD cannot exceed the maximum GPE available. So, common sense tells us that the excess work (force x distance) associated with the PD must be that of over unity.

This comparative analysis may not be totally germane, and here is the reasoning why. The same ball (inertial mass) is used for both demonstrations. Nevertheless, the bar-segment of the pendulum possesses its own separate inertial mass. Consequently, the mass/shape of the ball differs slightly compared to the overall mass/shape of the pendulum. However, the difference is not enough to account for the disparity of the distances traveled by the two different experiments.

This concept is somewhat abstract, so for review, here is another explanation. Let us assume, regarding these two experiments, that they are absolutely frictionless. Additionally, presume no air resistance. Therefore, with reference to the KD, as the ball strikes the platform's base, there is a one-time pulse of acceleration, producing momentum (velocity), which is KE.

Alternatively, regarding the PD, for each and every time the pendulum swings back and forth, there is a pulse of acceleration exerted on the cart. So, ultimately, these sequential series of propulsions result in a greater velocity (KE = momentum) when compared to the KD. The final KE (velocity) associated with the PD is considerably greater than the final KE associated with the KD. Yet the maximum kinetic energy possible, as a product GPE, can only be equal to that of the KD.

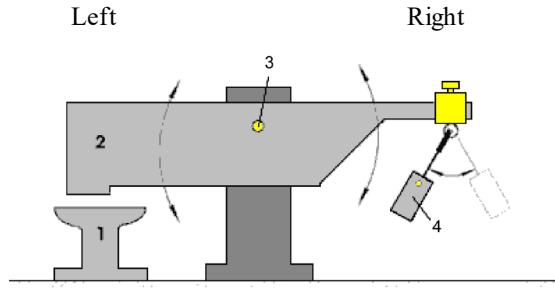
That is to say, for each time the pendulum swings back and forth, it propels the cart forward. However, this forward motion (KE) then causes the pendulum to lose some of its original upward height (GPE). So, after the swing, its height above the Earth is not as high as before the swing. The forward propelling motion (KE) of the cart borrows some of the energy from the swinging motion of the pendulum (GPE). As a result, as the pendulum swings back and forth, its amplitude progressively decreases until it terminates, at which time, the successive series of forward impulses from propulsion exerted on the cart then also ceases.

Again, there is a slight difference in the mass/shape of the ball versus pendulum, although not enough to account for the difference in the magnitude of the final KE between the two experiments. Basically, the PD outcome (3 times the distance of the KD) is not possible presuming the laws of modern physics are valid. However, it can be explained by utilizing the

concept of the accelerating factor of the **inflowing space/ether (PFGRT)**, somewhat analogous to work ($W = F \times D$) performed as a function of water falling from a dam.

The outcome of this experiment is of great practical value. For instance, this concept has already been incorporated into other Milkovic inventions, such as the pendulum water pump, as well as the two-stage mechanical oscillator pendulum-lever system, as found on Veljko Milkovic's YouTube channel. Of particular interest is a gain in the video "Superiority of Pendulum Drive—Potential Energy to Kinetic Energy."

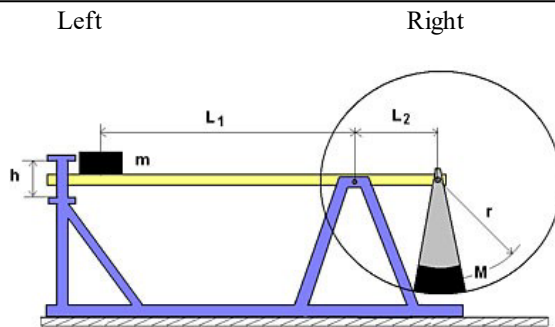
Technical drawings are also available on this site. After reviewing this YouTube clip, you should find it obvious that these inventions are truly over unity devices. Shown below in figures 5.4 and 5.5 are schematics of two such devices.



<https://www.veljkomilkovic.com/rucnaPumpaEng.html>

Figure 5.4 Pendulum Drive (PD) with Up/Down Motion [Fair Use]

- The pendulum (4) swings back and forth relative to its pivot (right).
- This produces, with respect to the fulcrum (3), an oscillating up and down motion of 2 relative to 1 (left).



<https://www.veljkomilkovic.com/rucnaPumpaEng.html>

Figure 5.5 Pendulum Drive (PD) with Horizontal Motion [Fair Use]

On the right, relative to its pivot as the pendulum swings back and forth, it produces, as a function of the fulcrum, an up and down oscillation of the black box (m) depicted on the left. The fundamental concept to appreciate is that the amount of input work needed to maintain the motion of the swinging pendulum is considerably less compared to the output work of the oscillating m. $Work = force \times distance$.

In addition, the two photos pictured below are of pendulum water pumps, which again appear to function as over unity devices.



Veljko Milkovic - <https://www.veljkomilkovic.com/rucnaPumpaEng.html>

Figure 5.6 Photo of Water Pump with Pendulum Drive (PD) [Fair Use]

This is a photo of the ultra efficient pendulum pump prototype made in Novi Sad in 2012 by PC Panex Ltd. with financial support from the Serbian Ministry of Education, Science and Technological Development and Provincial Secretariat for Economy, Employment, and Gender Equality of the Autonomous Province of Vojvodina, Republic of Serbia. [Source: <http://bit.ly/2aClpsu>]



Gravitational Energy Corp.



Bruce Feltenberger

Figure 5.7 Photo of Water Pump using Pendulum Drive (PD) and Inventor Bruce Feltenberger [Fair Use]

Operating the pendulum (the bar in front of the child) is as easy as pushing a child on a swing. It takes a little effort to get it moving, but once in motion, it takes far less effort to keep it swinging. The first advantage of the pendulum design resides in its pivot.

By reducing the friction at the pivot point of the pendulum to nearly zero, the pendulum swings very freely and only needs an occasional small input force to maintain its motion. This device is five times more efficient than a hand water pump without a pendulum. Therefore, the operator can pump 1,000 gallons per hour with very little fatigue. www.VeljkoMilkovic.com "Hand Water Pump with a Pendulum"

At 5 minutes, 24 seconds on the YouTube channel "Water Crisis—A Solution.wmv," you will see how easy it is for the two children to pump 1,000 gallons per hour. The left image in Figure 5.7 above with the children (arrows) and the following caption was also obtained from that Gravitational Energy Corporation website.

Additionally, the following other websites also refer to this revolutionary invention:

1. Apparent, but not acknowledged, over unity is found at 4 minutes, 40 seconds on this YouTube channel, Gravity-Assisted-Power.mp4.
2. Hand water pump with a pendulum: Technical Drawings Dimensions and Weights can be found on Veljko Milkovic's website.
3. Veljko Milkovic's website also demonstrates his invention.
4. What is more, the following website contains a published scientific article relevant to the over unity aspect of the pendulum water pump and the two-stage mechanical oscillator pendulum-lever system. <http://bit.ly/2b4puZ7>

The article's conclusion: "Based on the results obtained after testing the model, it was quite obvious that the amount of energy to be given to the system is less than the amount of energy obtained from the system."

Veljko Milkovic also proclaims that the work output is 12 times the work input. Assuming that Veljko Milkovic's claim is accurate, this invention is simple, practical, and eventually, most likely very profitable. For example, first, all one needs to do is pump water uphill with a work input-to-output ratio of 1 to 12 as stated by Veljko Milkovic. Next, use the GPE of the water to drive a turbine similar to a small power-generating dam. Note, water-generating dams have an efficiency of up to 80 percent. After that, employ a small portion of that electrical power to maintain the pendulum's motion. And finally, make use of the remaining electrical power production for practical work.

In addition, not only one pump could be utilized but thousands might be set in motion with respect to a water-filled dam. Presuming Milkovic's work input-output ratio is correct, this hypothetical power plant should be successful, moreover, practical.

One major benefit of this model is that a dam containing water not only produces energy, it stores it as well. Consequently, batteries are not necessary. Alternatively, in the situation where there is no water (e.g., desert), the pumping action of the device could be used to pressurize air within metal tanks. Later, that compressed air could be employed to drive a turbine, thus producing electricity.

Further, before use, the compressed air within the metal tanks could be heated with the application of solar power. This technique would then intensify the air pressure within the tanks, thereby increasing efficiency. Effectively, where there is gravity (inflow of space), there is also unlimited free clean energy. Now, all we have to do is learn how to use it.

In the author's opinion, if this concept ever comes to fruition, then know this: Veljko Milkovic is one of the greatest inventors to ever walk the face of the Earth.

So, what methodology does modern-day science use in order to explain Veljko Milkovic's pendulum cart experiment, what is more, its derived inventions? Fundamentally, it cannot do so. The videos and supporting scientific papers just presented offer no real adequate explanation as to how this invention works, devoid of violating the law of conservation of energy.

Then again, assuming PFGRT (inflowing space) is correct, for each and every time the pendulum swings back and forth (falls), it captures force from a new and continuously replenishing segment of the →accelerating factor of inflowing space (ether)←. Take note of, and this is crucial, in order for this over unity outcome to occur, the same object (like the pendulum) must "free fall" multiple times (oscillate), moreover, as a function of the inflowing ether accelerating factor.

This is not the case with regard to the kinetic drive experiment, for in that setting, it is a one-time "free fall" event.

To affirm this over unity assertion, let us now delve further into the concept. As a thought experiment, imagine, as illustrated and described above, the pendulum-powered water pump, however, in this case, →presume it is frictionless←. Therefore, as a function of the accelerating factor of inflowing space (ether) thereby producing the pendulum's "free falling motion," it then obtains acceleration/velocity.

However, since it is attached at its pivot, it begins to swing as a pendulum. As a result, it changes direction, which is another form of acceleration. Notice, as a function of only the pendulum's accelerating swinging motion, but not its accelerating "falling" motion, its direction changes, though the angular tangential velocity (ATV) does not.

In other words, there are two functions.

A. Function 1 is the free fall of the pendulum. Therefore, relative to this first aspect, the vertical translational velocity of the pendulum changes as a function of the linear accelerating factor of inflowing space/ether.

B. Function 2 is related to the pendulum's angular tangential velocity (ATV) due to the fact that it is attached at its pivot. So, regarding this second aspect, now as a function of only angular acceleration, its angular velocity does not change. Nevertheless, its direction goes from towards Earth to a way from Earth (angular acceleration).

To recap, translational acceleration (inflowing ether) produces a change in translational velocity. In contrast, angular acceleration (pendulum) does not alter ATV but instead, only its direction. In essence, translation motion and rotational motion are not the same physics.



Figure 5.8 Pendulum Water Pump Assisted by Little Finger [Fair Use]

“Continuous pumping of water with a little finger creates enormous efficiency concerning the input of energy up to 1,200 liters of water per hour without a major effort.”

So, as an explicit product of the pendulum’s swinging motion, as a function of its angular acceleration, it possesses angular velocity. In turn, from the location of the pendulum’s pivot, this angular acceleration generates a downward centrifugal force, as portrayed in Figure 5.8 above, specifically to the right of the fulcrum. This function, in turn, causes the water pump on the left side to oscillate up and down (work). Subsequently, that work is used for pumping water.

Now before continuing, recall/review:

- A frictionless wheel set in vertical rotational motion generates persistent centrifugal/centripetal forces, as a function of continuous angular acceleration. In fact, presuming it is frictionless, theoretically, it will rotate forever. Essentially, there is no resistance to its ATV.

- The accelerating factor of inflowing space accelerates half of the wheel towards Earth and equally de-accelerates the other half a way from Earth, therefore, leaving the original induced angular acceleration/velocity intact/unchanged.

- (Function 1) The function of accelerating inflowing space does change the pendulum’s translational velocity, both as it moves towards and then, subsequently, away from Earth

- (Function 2) Alternatively, the function of the pendulum’s angular acceleration does not alter angular velocity, only its direction, so the centrifugal/centripetal forces remain constant.

These two functions are superimposed upon one another. However, in order to comprehend the following explanations, the reader must, in his mind, divide them into distinct separate concepts. Again, assume frictionless scenario.

1. At first, the pendulum free falls towards Earth from the acceleration factor of inflowing space. (F-1)

2. Then, because of the pivot, this motion is transformed into swinging angular acceleration/velocity from towards Earth to a way from Earth, moreover, without resistance, no change in ATV. (F-2)

3. Subsequently, the pendulum begins to climb a way from Earth, whereby a new segment of the accelerating factor of inflowing space slows, moreover, eventually stops that ascent. (F-1)

4. After that, another new portion of the inflowing ether initiates the same process all over again, then again, and a gain, and so on, and so forth. (F-1 then F-2 then F-1 and so on).

5. What is important to acknowledge is, at the bottom of each separate swinging motion, there is then a force directed towards Earth.

- If the apparatus is held rigid, then no work is achievable, even though the downward force remains.

- From another perspective, a gain presuming no downward work/movement as a function of force is permitted, the pendulum, after completing its first swing, returns to its original height above the Earth's surface, just as it was prior to the swing.

- What is more, as it swings back and forth, the same oscillating progression and outcome is repeated ad infinitum.

- Alternatively, as a function of the pendulum's angular acceleration/velocity, thereby producing a downward force, and assuming the apparatus is permitted to move in the same direction as the force, then work can be performed ($W = F \times D$).

- Additionally, if downward work (movement) from force is executed (e.g., pendulum-powered water pump), then compared to the pendulum's original height above the Earth prior to the swing, its height above the Earth after the swing is reduced.

- Even so, the input work needed to maintain the pendulum swinging motion (height) is significantly less compared to the output work, according to Milkovic, by a Factor of 12.

Principally, in order for the pump to perform work, a portion of the pendulum's swinging motion is used or borrowed. Nevertheless, the overall amount of work borrowed from the swinging motion is significantly less than the work performed by the pump. So where does the over unity force/energy originate from? Energy is drawn from the continuous accelerating factor of the inflow of space/ether (gravitational field), to some extent, analogous to the production of energy as a function of water falling from a dam. Once this concept is acknowledged, other possibilities emerge as offered in the next sections.

Incidentally, if the reader is interested, the best websites for demonstrating this revolutionary invention are at:

<http://bit.ly/2aPMWib> and <http://gravityassistedpower.com/photos/videos.htm>

There are multiple videos available at these two websites. The author suggests the reader explore both sites. Each site listed above refers to the Gravitational Energy Corporation: *<http://bit.ly/2aPMWib>*.

The Gravitational Energy Corporation does not formally assert over unity; nevertheless, it does claim that by using a pendulum water pump, "then this allows the operator to work at the pump with at least five times less fatigue than any other hand-held operated pump. Therefore, the operator can pump 1,000 gallons per hour with very little effort."

Regardless of whether or not over unity is officially proclaimed by this company, after reviewing the videos, it is obvious over unity is present. The author has attempted to contact, furthermore, locate the Gravitational Energy Corporation to no avail. There is no longer contact information listed. Nevertheless, the company's website with its information is still accessible. So the owners must still want the information to be available for all of mankind.

For those individuals who want to learn even more about this subject, the following websites are also suggested. Over unity, which has already been shown in this section by Milkovic, also can be found at the first two websites. They clearly demonstrate over unity.

<https://www.youtube.com/watch?v=yCkVmv4zizM>
<https://www.youtube.com/watch?v=8n7mvpLpP5A>

For both the physicists and nonscientists, these additional websites also demonstrate over unity.

<http://www.thescienceforum.com/pseudoscience/21344-pendulum-lever-system-overunity.html>

<http://www.greenoptimistic.com/serbian-overunity-device-free-energy-from-gravity-20090209/#.VSGOTNy4III>

<http://www.borderlands.de/Links/Two>

<http://www.veljkomilkovic.com/OscilacijeEng.html#measurements>

<https://www.youtube.com/watch?v=Y1cKWIAFTOI>

Regarding the last YouTube video listed above, notice that once the pendulum pump is set in motion by the operator, specifically at a given height, there appears to be over unity, because from that point on, no outside external work is added to maintain the continuously operating system. This is assuming the work performed by the air compression piston, which maintains the pendulum's motion, is a part of a closed system. However, with respect to this video, this effect is not entirely evident.

Now, please refer to figures 5.9 and 5.10 which demonstrate that a pendulum's swinging motion (like the playground swing) is a function of the conversion of GPE to KE and then back to GPE and so on and so forth.

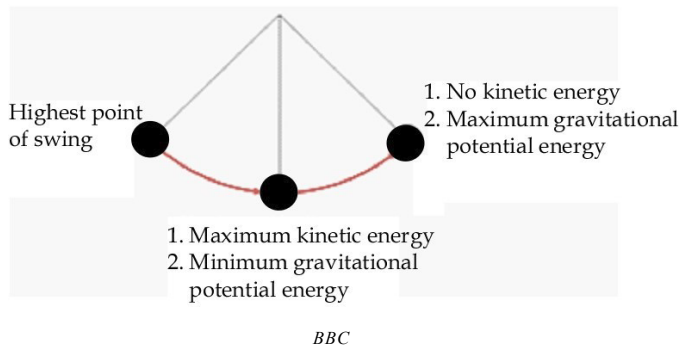
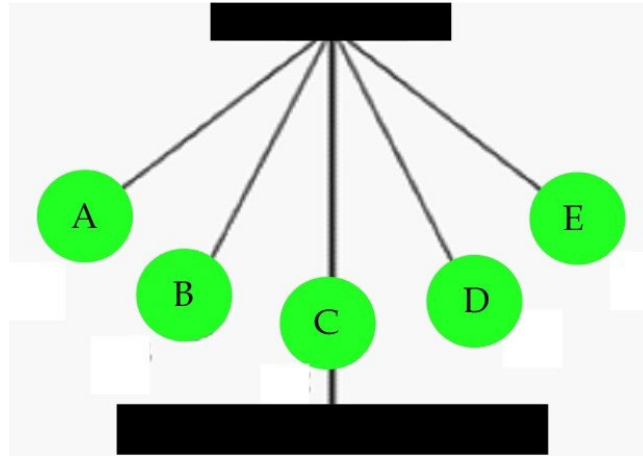


Figure 5.9 Converting GPE to KE and Back [Fair Use]

The pendulum/swing oscillates back and forth, GPE is converted to KE and then back to GPE and so on.



Kimberlytorresow19mp 06/25/2018

Figure 5.10 Compression and Weightlessness [Fair Use]

At positions A and E, you feel weightlessness, and at location C, you experience compression from force towards Earth.

As another example, presuppose you are situated on a swing, oscillating back and forth. So, as you reach the apex of your upward motion and then begin to fall back down towards Earth, you feel weightlessness. In contrast, at the bottom of the swing, whereby you reorient from towards Earth to a way from Earth, you then experience compression.

And so, for each and every time you oscillate back and forth, at the bottom of that motion, a force is exerted on you, as well as the swing, moreover, oriented towards Earth. In addition, presuming a frictionless system, this recurring force occurs ad infinitum. Furthermore, with respect to this closed system, other than the KE/GPE combination, there is no other energy accessible.

Again, bear in mind, the ether does not resist an object's velocity, whether it is translational velocity or the angular velocity of a rotating wheel. As an example, again regarding the latter, a spinning wheel, including a vertical spinning wheel devoid of friction will theoretically rotate forever, furthermore, producing an endless centripetal/centrifugal force. Fundamentally, as you swing back and forth, there is no resistance to your angular velocity from the ether.

The swing:

- (Function 1, translation motion) Assume, vis-a-vis this new theory, inflowing space accelerates both you and the swing towards Earth.
- (Function 2, angular motion) But, because of the swing's pivot, your accelerated direction is altered, which transforms your downward motion into angular velocity/acceleration. In addition, as you change direction from towards to away from Earth, there is no change in your tangential angular velocity.
- Even so, at the bottom of the swing, you still feel compression (force) towards Earth.
- (Function 1, translational motion) Then, eventually, as you begin to climb away from Earth, a new portion of the accelerating factor of the inflowing ether slows and ultimately reverses your ascent, whereby the process then repeats itself.

- Again, presupposing a frictionless system with no work permitted, this oscillating function, including the production of downward force continues endlessly.
- Alternatively, at the bottom of the swinging motion, at the position where there is a downward force, if you and the swing are allowed to move towards Earth (e.g., pendulum-powered water pump), work is performed (force X distance).
- If this occurs, then as you again swing away from Earth, your height, after the swing, is now less than before the swing.
- What is more, in order to maintain the swing's original height, the amount of input work required is considerably less compared to the output work performed at the bottom of the swing.
- This outcome cannot be explained by classic physics; it is an over unity hypothetical model.
- In contrast, if force and energy are extracted from a continuous inflow of the accelerating factor of the inflowing ether, then this is the source of the over unity.
- This hypothesis also gives explanation to the previous listed YouTube videos and explanations regarding Milkovic's inventions.

The author has one more reflection. Numerous other experimenters have proclaimed over unity inventions. Even so, given that they all contradict the law of conservation of energy, they are ridiculed, ignored, and perhaps, even suppressed. However, if Milkovic's pendulum-powered water pump invention proves genuine, which the author believes is true, then the classic law of conservation of energy is in erratum. Presuming this is so, then this opens a pathway for acceptance by the scientific community, even perhaps, for all of mankind of the potential for other over unity inventions. Hopefully, closed minds will then be open to new concepts, ideas, and developments, including other over unity devices.

5.2.3 The Rotating Wheel with Attached Buckets and Pistons.

Now, assuming that the over unity pendulum-powered water pump works as advertised, then so should this hypothetical device, since both concepts are based upon the same inflowing ether hypothesis (PFGRT).

The next series of figures, followed by written dissertations, is the methodology by which the author has chosen to explain this concept. So, to begin with, please refer to figures 5.11 and 5.12 below.

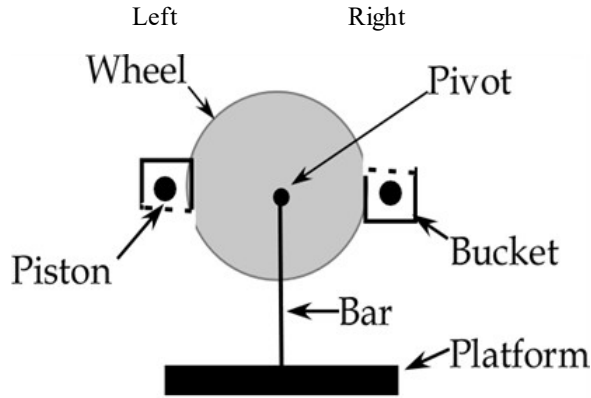


Figure 5.11 Rotating Device with Attached Pistons in Buckets

Figure 5.11 depicts the overall physical structure of the device.

(See Figure 5.11 above.) Picture in your mind a wheel capable of rotation. Additionally, envision, as depicted above, that the wheel is attached at its pivot to a vertical bar and then the bar to a platform, the latter located on the Earth’s surface. Then, imagine that on opposite sides of the wheel there are fixed buckets, each of which contains an attached piston, which can freely move in and out. Observe, in Figure 5.11, both pistons are located inside of their respective buckets.

Refer to Figure 5.12 below (Time 1). →Assume the wheel is stationary←. At Time 1, the initial orientation, presume the left piston is located within its bucket, whereas the right piston is extended outside, as shown below.

Later at Time 2 (Figure 5.13), given that the opening of the left bucket faces towards Earth, its piston ”falls” out. Moreover, since it is attached, it produces a torque towards Earth.

On the opposite side, the right bucket’s opening faces away from Earth; furthermore, its piston is extended outside. Consequently, it falls into its bucket, again generating a torque towards Earth. Now, if one presupposes that the wheel is stationary, these torques are equal as well as symmetrical. Therefore, as a function of this coupled function, there is no initiation of rotation.

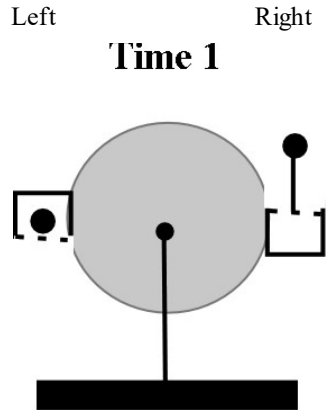


Figure 5.12 Starting Position

Figure 5.12 shows the orientation of the device at the starting position defined as Time 1. In addition, assume the wheel is stationary.

At Time 1, the initial orientation, presume the left piston is located within its bucket, whereas the right piston is extended outside, as shown above.

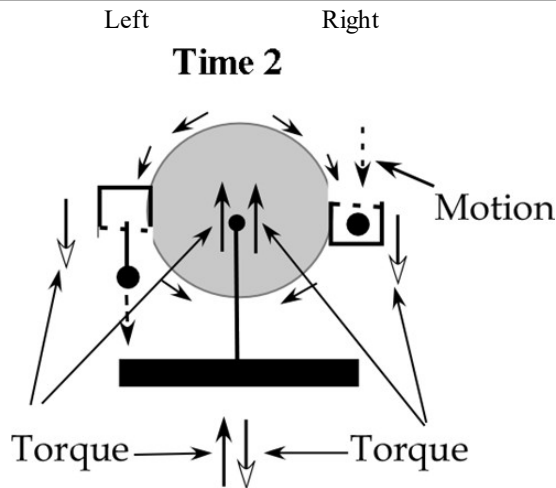


Figure 5.13 Pistons Falling into and out of the Bucket

Again, presuppose no initial rotation. Time 2 is when the two pistons "fall" towards Earth. Now, as the left piston falls out of and the right piston falls into its bucket, then equal, symmetrical, and bilateral torques are generated. And so, for that reason, there is no initiation of rotation. As shown, a torque is a coupled function of two forces. The right half of the wheel is trying to rotate clockwise and the left half counterclockwise. As a result, they counteract one another and the wheel remains stationary.

On the other hand, what transpires when the wheel is initially rotating? See Figure 5.14 below.

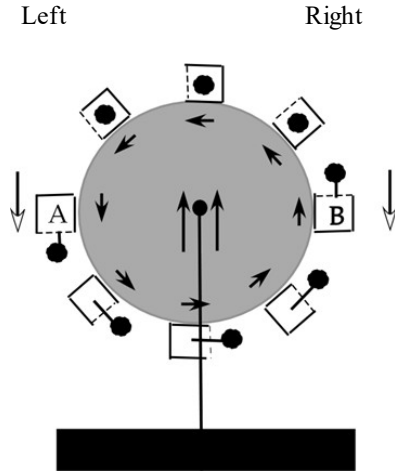


Figure 5.14 Position of the Pistons Relative to their Respective Buckets during 360 Degrees of Rotation.

A is the left bucket/piston. B is the right bucket/piston. When the wheel rotates counterclockwise, B exchanges places with A and vice versa. This schematic demonstrates the changing orientations of the pistons relative to their respective buckets during 360 degrees of rotation.

Figure 5.14 as shown above is a schematic of the relative positions of the pistons/buckets as a function of the wheel's 360 degrees of rotation.

Now, refer to figures 5.15 and 5.16 below. These two figures demonstrate what transpires when the wheel is rotated, first rapidly (Figure 5.15) and then at a slower rate (Figure 5.16). Each figure is followed by a discussion.

Assume the wheel (Figure 5.15 below) is rapidly rotating counterclockwise as portrayed. Due to the centrifugal force, the pistons remain within their respective buckets, presupposing they were there to begin with.

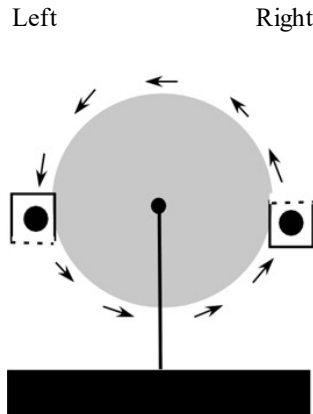


Figure 5.15 Rapid Rotation

During rapid rotation, moreover assuming the pistons are initially located inside their respective buckets, the centrifugal force then maintains those positions. As a consequence, they remain within their respective buckets.

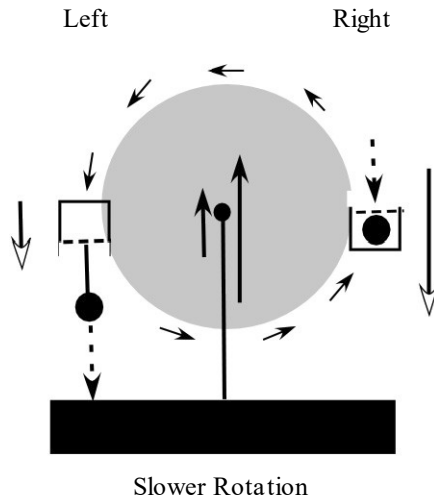


Figure 5.16 Fall of the Piston with Slower Rotation

- The dotted arrows depict the direction of the "fall" of the piston.
- The solid arrows, arranged in a circle around the wheel, denote the direction of rotation, counter-clockwise.
- The vertical solid/hollow arrowheads depict the torques. A torque is a coupled function of force. One force is derived from the "falling piston" towards Earth (hollow arrowhead), while the other force is located at the pivot, moreover, oriented in the opposite direction (solid arrowhead).

See Figure 5.16 above. As the wheel's rotational rate slows from friction, then relative to their associated buckets, the pistons cyclically and sequentially begin to move in and out as already presented in Figure 5.14.

For that reason, as shown in Figure 5.16, the torque generated on the left side is significantly less compared to the torque on the right (see discussion below). So at this point in time, the wheel suddenly slows down rapidly. More importantly, this sudden reduction is not related to friction nor, for that matter, from classic gravitational potential energy (see discussion below).

Please pay close attention now, for here is the key concept. When the piston on the left side falls out of its bucket, it exerts less torque as compared to the right side, whereby it falls into its bucket. This is because on the left side, the piston falls in the direction of rotation, whereas on the right side it falls against the direction of rotation. → Unlike the previous stationary example, moreover, as a result of the unequal torques, with respect to this scenario, there is an abrupt and rapid reduction in the wheel's rotational rate. But most importantly, this effect is not related to friction ←.

Here is the key question: From where does the force originate causing the wheel to rapidly slow down? It cannot be from gravitational potential energy, since for every 360 degrees of rotation, the buckets and pistons return to their original orientations (height above Earth).

Strictly speaking, while rotating, whatever gravitational potential energy is used up on one side is then returned on the other side. For that reason, one cannot give explanation to the results of this experimental device utilizing the classic concept of gravitational potential energy.

In contrast, as with the pendulum drive/kinetic drive experiments, it can be understood by using the inflowing ether theory (PFGRT). Again, this new theory assumes there is a continuous inflow of accelerated space (force), which is then utilized to slow the wheel's rotational rate.

This system only works if the pistons repetitively "fall" to Earth as a function of the accelerating factor of inflowing space, just as with the pendulum water pump.

In essence, again, the energy and force that rapidly slows the wheel's rotation is derived from the "repetitive fall" (rotating oscillation) of the pistons. In turn, this is a function of the inflow of accelerating space (ether). This concept is analogous to a waterfall, whereby force and energy are produced from a continuous stream of falling water. But with reference to PFGRT, it is from the continuous accelerating factor of the inflowing ether.

As usual, in science, it is not that simple. For example, the torque directed towards Earth on the right side is greater than on the left side, but the time of flight of the piston on the left is longer than on the right, since it is "falling" in the direction of rotation. Therefore, at various times, there are unequal inertial masses relative to the two halves of the wheel.

Nevertheless, overall, this author knows this device works because a somewhat similar working model has actually been built and functions as advertised. It is pictured below and in the following schematic. See figures 5.17 and 5.18 below.

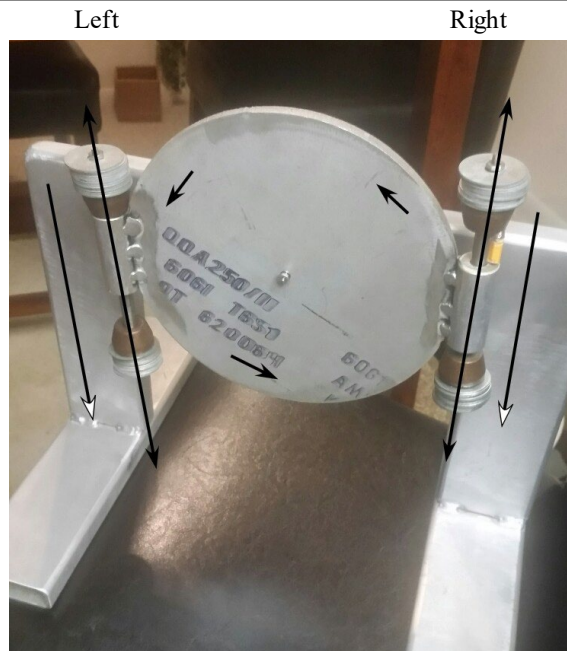


Figure 5.17 Actual Experimental Rotating Wheel

The arrows located on the face of the wheel depict the direction of rotation, counterclockwise. The double-headed black arrows show, during rotation, how the pistons slide up and down relative to the holders. The hollow-headed arrows depict the direction of the fall of the pistons.

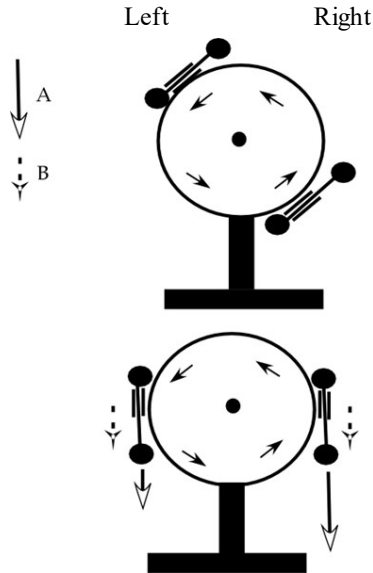


Figure 5.18 Rapid Slowdown

- $A = \text{force}$ and $B = \text{motion}$.
- The small dotted arrows symbolize the direction of the fall of the barbell-like pistons. The larger hollow-headed solid arrows depict the amount of force/torque directed towards Earth ($R > L$).

See figures 5.17 and 5.18 above.

As the wheel continuously rotates counter-clockwise, both barbell-like pistons fall to Earth. On the left, since the fall is in the direction of rotation, there is then less force (torque) directed towards Earth, versus the right side whereby the fall is against the direction of wheel's rotation. Therefore, the wheel rapidly slows down, moreover, without using GPE.

Now, consider this logic. →assuming no friction← or air resistance, if one captures some of the force that slows the wheel's rotation rate, (as a result, the torque is then equal on both sides), moreover, uses it for the production of energy, the wheel will not slow, even in the presence of constant energy extraction. Obviously, this has practical implications, for if real, there is an endless supply of pollution-free energy, located anywhere on Earth or, for that matter, on any planet with gravity.

As an example, imagine a massive wheel associated with numerous surrounding buckets/pistons.

Additionally, if one envisions that the pistons, while in the process of "falling" into their respective buckets, on the right side, compressed the atmosphere, but in contrast not while "falling out" on the left side, then the compressed air could be used to drive a turbine. Furthermore, relative to the right side, this function would diminish the pistons' "rate of fall" into their respective buckets. In turn, the torque on that side would then be reduced.

What's more, if sufficient energy was extracted, then the torques generated relevant to both sides could be equal. Assuming all of this actually occurs, the wheel's rotational rate would remain unchanged, even with constant energy extraction (assume a frictionless system). Moreover, if additional energy was extracted, then the effects of friction could be overcome or else the wheel rotational rate could even increase.

This hypothetical device sounds fairly simple although it is not, for there are many intricate factors involved, including gyroscope torque effects related to spinning turbines located on a large rotating wheel. As a result, this device, when compared to a pendulum-powered water pump is much more complicated, therefore, considerably less practical.

The author now refers the reader to the four websites given below:

1. <https://www.youtube.com/watch?v=rbCnzsFjvQU>
2. <https://www.youtube.com/watch?v=88Z2x1MEex8>
3. <https://www.youtube.com/watch?v=rsBplmMDcRQ>
4. <https://www.youtube.com/watch?v=DsvPICaiVjI>

After reviewing these four websites, hopefully, the reader will begin to understand where the force originates from that keeps the unbalanced wheel continually rotating. The inflowing, accelerating space theory explains the underlying physical principles of this form of overunity.

5.2.4 The Ferris Wheel

See, Figure 5.19 of a Ferris wheel and the following discussion.

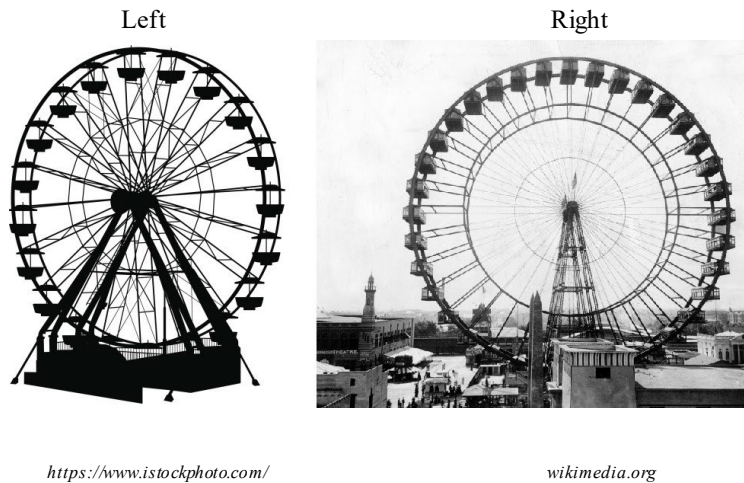


Figure 5.19 Ferris Wheel Rotating Counter Clockwise [Fair Use]

The author observed that when he carried a small ball with its attached rubber string onto a Ferris wheel (FW), and let it hang down during the FW's rotation, it behaved as revealed below. When moving in the direction away from Earth (right), the string stretched significantly more compared to when traveling towards Earth (left). In addition, the author felt compression (force) while moving from Earth and relative weightlessness traveling to Earth.

→Assuming a frictionless system←, moreover, presupposing no air resistance, therefore, no need for a motor drive, hypothetically then, once rotation is initiated, the FW, the author, and the ball on the string would revolve ad infinitum, devoid of energy input. Consequently, as a function of 360 degrees of rotation, the ball with its string would cyclically and repetitively stretch and then contract theoretically forever, again without energy input. This oscillating movement is the definition of work ($W = F \times D$).

Additionally, this work (energy) could then be extracted, such as for the production of electricity, without decreasing or only minimally reducing the Ferris wheel's rotational rate. So

supposedly, just as with the pendulum water pump, the amount of work to maintain the FW rotational rate should be significantly less than the output work used to produce the electricity. The inflowing accelerating factor of the ether acting upon a repetitive oscillating falling object is the origin of the over unity energy. Again, this concept is contrary to the law of conservation of energy but is consistent with PFGR or using the new lexicology, the **inflowing ether**.

→ As an aside, take note. With respect to a classic/typical/balanced FW located at a carnival (this time without the buckets/pistons, furthermore, assume no friction and no motor drive), the gravitational force directed towards Earth is equal on both sides of the FW, which maintains its rotation, but the compression is only evident while moving away from Earth. Even so, this compression effect does not reduce the FW's rotational rate. For future reference, regarding inertial mass addressed later in this chapter, remember this concept←.

As an adjunct, moreover, to further give explanation to this concept, the following device, though imaginary, is presented which could have practical value, although in no way matching the proven pendulum water pump. It is offered for an entirely different purpose as spelled out in the summary. Refer to Figure 5.20.

As already hypothesized, presume a rotating frictionless →balanced← FW structure oriented as just depicted. However, in this scenario, substitute the rubber ball with a permanent bar magnet (PM), still attached to the rubber string. In addition, presuppose its down and then up oscillating motion (on the right side of the FW) takes place adjacent to a straight copper wire conductor, which itself is fixed to the FW. For that reason, during the FW's rotation, moreover, specifically in the direction away from earth (right), the PM will oscillate first down, then up, relative to the adjacent fixed copper wire conductor.

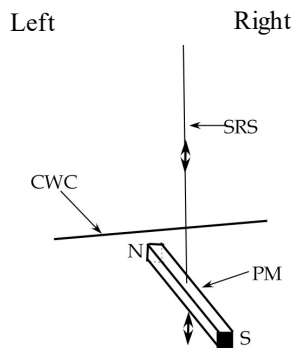


Figure 5.20 Inducing Current in Copper Wire

- *SRS = Stretchable Rubber String*
- *CWC = Copper Wire Conductor*
- *PM = Permanent Magnet*
- *Double Black Arrows = Up and down motion relative to the CWC*
- *As the permanent magnet moves up and down relative to the fixed conductor, a current is generated.*

Therefore, as a result of this relative motion, a current would be induced; furthermore, it could be extracted.

The induction of the current does not significantly slow the FW's rotation (thus over unity). This is because, regarding the production of the current, moreover, as a function of 360 degrees of rotation, the sum total of all the forces, including the Lorentz forces exerted on the PM, conductor, and FW, counteract one another. Principally, these are balanced forces.

As another aside, if a practical device is ever built, hundreds of these devices could be associated with a single mega-giant Ferris wheel.

The author is not entirely convinced of the validity of this concept, for it is extremely multifaceted, in fact, too complex to resolve without intricate math. Even so, it is a great mental exercise.

Regarding PFGRT, the only over unity energy available is from the PM repetitive, free-falling motion during multiple rotations, **moreover, as a function of only the accelerating factor of inflowing space/ether**. This oscillating motion is what produces multiple stretches and then contractions of the rubber string and its attached PM. Remember also, the stretched rubber string is a form of potential energy.

Now, as just described, presuppose there are multiple separate interacting bar magnets, rubber strings, and conductor wires, however, at this time, evenly distributed over 360 degrees (FW). In addition, vis-à-vis the following discussion, the positive numbers indicate an increased rotational rate, whereas the negative numbers represent a decreased rotational rate of the FW. Assume the FW rotates counterclockwise and presume no friction.

- [+1] So on the left side, while the PM is in the process of →rotating← towards Earth, but on the right →falling← to Earth, then for that interval of time, the inertial mass of the left half of the FW is greater compared to the right side. Therefore, as a result of this asymmetry, the FW's rotational rate increases.

- [-1] In addition, on the right, when the PM falls, moreover, as it interacts with the wire conductor to create a current, the action then reduces its "rate of fall." Simultaneously, a force is exerted on the wire conductor, which then slows the FW's rotation.

- [-2] Furthermore, as the rubber string stretches, this function creates a force that also slows the wheel's rotational rate.

- [-3] Later on, when the PM returns, as a function of stored potential energy within the rubber string, the interaction with the conductor then decelerates the PM's "rate of return" by force, again slowing the FW's rotation.

- [+2] However, at the same time, this function also places a force on the conductor wire, which increases the FW's rotational rate.

- [+3] What is more, the string's "de-stretching" function also increases the rate of rotation.

Now, given all of the above, relative to the induction of the current, the sum total all the forces are balanced; accordingly, there is no decrease of the FW's rotational rate.

Obviously, for the reader, but especially for the nonscientist, this explanation is extremely complicated, moreover, probably very confusing. For that reason, the author will now re-explain it from a different perspective. Referring to the left half of the FW, as it rotates/travels towards Earth, the PM hangs relatively motionless on its string. So in this setting, it does not interact with the conductor wire. The inertial mass of the left half of the FW remains relatively constant.

In contrast, with regard to the right half of FW, the PM, while rotating from the bottom to the apex, along with the FW, oscillates first down, then up. Therefore, relative to the copper wire conductor, this motion induces a current in both directions.

So, with regard to the right side, whatever overall forces are exerted on the FW during the PM downstroke, they are counteracted by anti-symmetrical forces exerted on it by the upstroke.

Since work is used to induce the current, there may be a slight reduction of the FW's rotational rate, but only related to the sum total of the Lorentz forces, exclusively on the right side of the FW. However, as previously denoted, this reduction in rotation is counteracted by augmented rotation, as a function of the relative increased inertial mass on the left compared to

the right, which occurs during the time of the "fall" of the PM on the right. So, again overall, a current is produced without a significant reduction in the Ferris wheel's rotational rate.

Nevertheless, in reality, again, there may indeed be a small overall reduction of the FW rotational rate as a function of current production. But the input work, in order to maintain the rotational rate of the FW, would be significantly less compared to the output work used for the production of the current—analogous to the pendulum powered water pump.

Summary

This model is so intricate that it obviously requires mathematical proof too complex for this author. Nevertheless, as with the pendulum water pump, the underlying rationale for why the author chose to present this Ferris wheel example is to reinforce the idea that the over unity energy generated/captured is always related to the repetitive fall of an oscillating object, moreover, as a function of accelerating factor of inflowing space (ether).

5.3 The Homopolar Motor and Homopolar Generator

5.3.1 The Homopolar Generator

5.3.2 The Homopolar Motor

*A physical law or scientific law is a theoretical statement inferred from particular facts, applicable to a defined group or class of phenomena, and expressible by the statement that a particular phenomenon **always** occurs if certain conditions be present. Physical laws are typically conclusions based on repeated scientific experiments and observations over many years and which have become accepted universally within the scientific community. <http://bit.ly/2a1Dta19>*

If a law of physics is truly a law, then there should be absolutely no exceptions. However, assuming there is, then by some definitions, it is not a law. The homopolar motor/generator combination appears to defy Newton's third law, as well as Einstein's relativity principle. This conundrum will now be clarified. To do so, first, the homopolar generator will be discussed, then the homopolar motor, both as functions of **the ether**.

For the nonscientist, before reading this section, viewing the website given below would be helpful. This site titled, "Electromagnetism - Maxwell's Laws," explains the classic interpretation of electromagnetism.

<https://www.chegg.com/homework-help/definitions/maxwells-laws-of-electromagnetism-2>

5.3.1 Homopolar Generator

A schematic of the homopolar generator is shown in Figure 5.21 below. This is followed by a written description of its structure, then its function, and finally, how it relates to the existence of **the ether**.

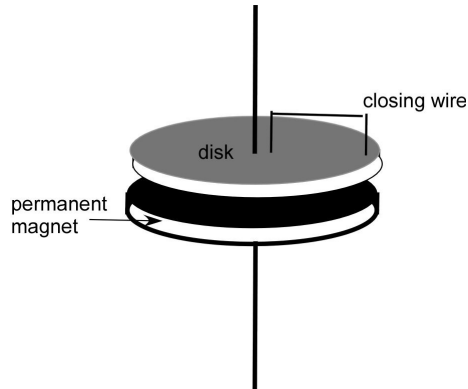


Figure 5.21 Schematic of the Homopolar Generator

Structure of the Homopolar Generator

- A. The upper disk is a copper conductor (defined as disk). In addition, it is attached to a vertical pole.
- B. The copper disk is capable of independent rotation relative to the pole and vice versa.
- C. The magnet is a permanent circular disk magnet (defined as magnet). Its north-south axis is aligned parallel to the vertical pole. It is also attached to the vertical pole.
- D. The magnet is separated by a space apart from the disk. In addition, the magnet can independently rotate with regard to the disk and vice versa.
- E. The closing wire is a copper wire conductor, which connects the center of the disk to its periphery.

Function of the Homopolar Generator

- A. If the disk is rotated by force relative to the stationary magnet, then a current is generated.
 - B. If the magnet is rotated by force but the disk remains stationary, then no current is produced.
 - C. If the disk is rotated synchronously along with the magnet, a current is again induced.
- This type of generator obviously violates Einstein's relative motion principle. This is because rotating the disk relative to the magnet (A) does not have the same effect as rotating the magnet relative to the disk (B). In addition, simultaneously rotating the magnet along with disk still produces a current (C). Again, with respect to (A) and (B), this violates Einstein's relativity principle. Furthermore, regarding (C), even though a current is induced, there is no relative motion of the disk versus the magnet. So, there must be a synchronous movement of both relative to something else. And what is that? **The ether**.

5.3.2 Homopolar Motor

The homopolar motor is structured as presented in figures 5.22, 5.23, and 5.24 below. This is followed by a written description of its structure, then its function, and finally, how the function relates to the existence of the ether.

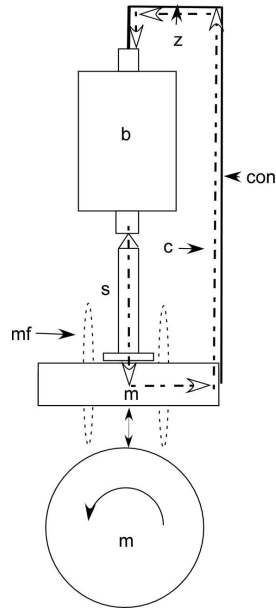
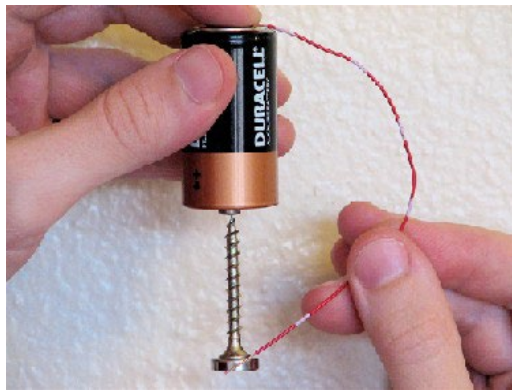


Figure 5.22 Drawing of Motor with Battery and Nail



Wikimedia Commons

Figure 5.23 Picture of Actual Homopolar Motor [Fair Use]

In these figures, 5.22 and 5.23, the conductor and magnet are one in the same, since the permanent magnet possesses a nickel coating, which functions as the conductor. See Figure 5.22 above for labeling as shown below.

- B = battery

- m = nickel coated permanent magnet
- mf = magnetic field
- con = closing conductor wire
- c = current (dotted line)
- s = steel nail
- arrow on m = direction of rotation

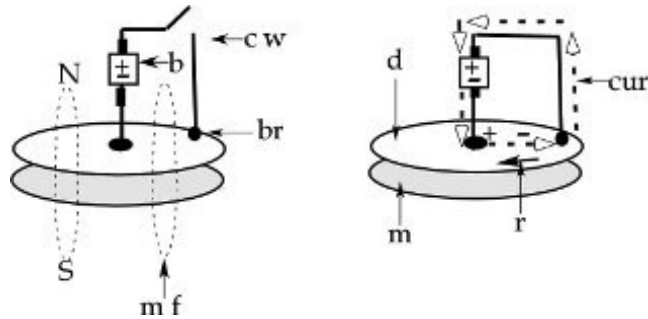


Figure 5.24 Disk and Magnet are Separate Structures

In this second example, the disk conductor and disk magnet are two separate structures.

- d = disk conductor/magnet
- cur = direction of current
- m = magnet
- $+$ = positive charge
- mf = magnetic field
- $-$ = negative charge
- cw = closing wire
- B = battery
- br = brush
- r = rotation direction

Structure of the Homopolar Motor (See only figures 5.22 and 5.23.)

A. The disk-shaped conductor magnet combination is attached to the flat base of the metal screw as shown. Therefore, it magnetizes the screw.

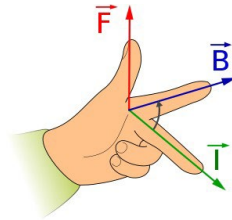
B. The tip of the magnetized screw with its attached magnet is then placed in contact with the battery's lower electrode, moreover, becomes attached, since it is now magnetized.

C. One end of the closing wire is attached to the battery's upper electrode, whereas the other end, by the use of a brush, gently touches the outer side of the magnet/conductor disk. Even so, the brush still allows the magnet/conductor disk to freely rotate.

Function of the Homopolar Motor

Before proceeding, recall the production of the Lorentz force is as shown in Figure 5.25 below. Furthermore, recollect that when the current and the magnetic field lines are parallel, there is no Lorentz force.

Fleming's Left-hand Rule



Wikimedia Commons

$B =$ magnetic field; $I =$ current; $F =$ force

Figure 5.25 Lorentz Force using Left-Hand Rule [Fair Use]

*Orientation of Lorentz force with respect to the direction of the current, as well as of the magnetic field.
Left-hand rule for an \rightarrow electron-carrying current \leftarrow in a magnetic field B .*

See Figure 5.26 below. The function of the homopolar motor is now divided into segments a, b, c, d, e, f.

Segment a. The current passes vertically down from the battery's lower electrode through the metal screw. Now, concerning only this segment, the current and magnetic field lines are parallel to one another. Therefore, no Lorentz force is generated.

Segment b. The current then turns horizontal as it traverses through the magnet/conductor disk. Regarding this specific segment, given that the current and magnetic field lines are perpendicular relative to one another, a Lorentz force is then generated. Therefore, the disk rotates.

Segments c, d, e, f. The current subsequently enters the copper closing wire segment, whereby it returns to the battery's upper electrode. Referring to these segments, there are Lorentz forces generated. However, these forces will be deliberated later on in this section.

Again, concerning only the conductor/magnet segment labeled b, a Lorentz force is generated. This is because at this location, the horizontal current interacts with the vertical-oriented magnetic field lines. This function then induces a sideways Lorentz force, causing the magnet/conductor and screw to rotate. A brief video of this motor can be found at <http://bit.ly/2aPQ07e>.

Here is the crucial concept. From the reference frame of only segment b (the disk conductor/magnet combination), there is no equal and opposite reaction force. Otherwise, there would be no rotation. Nevertheless, there could be an equal and opposite force exerted on the closing wire, divided into segments c, d, e, and f as shown below in Figure 5.26.

Observe the portion of the closing wire section specifically labeled c (Figure 5.26), which extends outward parallel to the conductor/magnet's plane. At this location, as revealed below, the magnetic field lines reverse orientation. For that reason, the Lorentz force exerted on this specific portion of the closing wire (c) is then oriented in the opposite direction when compared to the conductor magnet segment b.

On the other hand, if the closing wire followed the field lines for a given distance, parallel rather than perpendicular, as shown in Figure 5.27 below (moreover, subsequently completed the circuit), then the two scenarios for opposing Lorentz forces *possibly* would not be the same.

Basically, there are different opposite Lorentz forces exerted on the closing wire (segment c) depending upon whether it initially follows the field lines or doesn't.

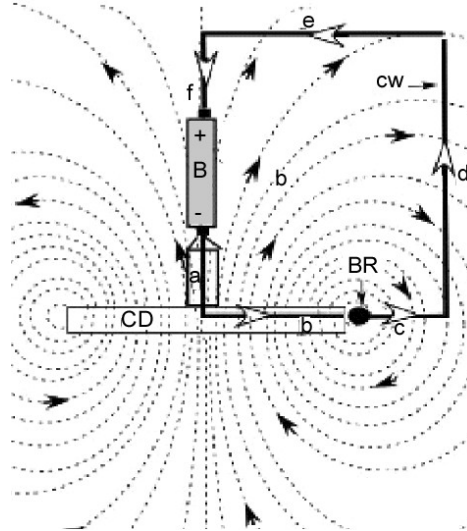


Figure 5.26 Segments Show the Function of the Homopolar Motor

- *a* = metal screw
- *B* = battery
- *CD* = conductor or disk
- *BR* = brush
- *b* = segment B magnetic field and current perpendicular to one another = conductor magnet segment
- *CW* = closing wire
- *c* = segment C, first segment of closing wire
- *d, e, and f* = second, third, and fourth portion of closing wire

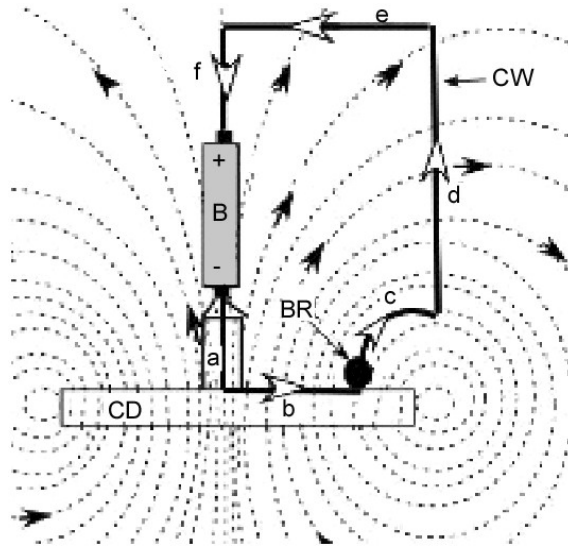


Figure 5.27 Segment c Follows the Field Lines

Nevertheless, concerning this specific example, this concept may not be germane, because, as shown above, (compare Figure 5.27 to Figure 5.26) there is a reduction of the Lorentz forces located in both segment b—since b is shorter—as well as the curving closing wire segment, labeled c, as it now follows parallel to the field lines, so in this specific example, no Lorentz force (c).

Alternatively, the amount of distance by which the closing wire segment c follows the field lines could be varied, moreover, without affecting segment b (Figure 5.27). Therefore, given this circumstance, a violation of Newton's third law would apply.

Principally, (Figure 5.27), the conductor/magnet segment b is associated with only one Lorentz force, which produces rotation. In contrast, referring to the Lorentz force of segment c, there are two or more possibilities. So, by logic, the opposing forces cannot, in all instances, be equal and opposite.

The Lorentz forces associated with closing wire segments d and e are minimal, given that they are located at a distance from the magnetic field. What is more, segment f is parallel to the field lines, so there is no force.

Additionally, there is a force located at the junction of the nail with the lower battery's electrode. But this force is oriented in the same direction when compared to the Lorentz force produced by the conductor/magnet segment b.

In summary, given all of the above, it is obvious that the sum total of all the Lorentz forces located within a closed system of this nature are not, in all instances, equal and opposite. Consequently, this device violates Newton's third law.

The above description, especially for the average individual without a scientific background, is probably very confusing. So, to simplify the explanation, here is the fundamental concept of this mental exercise. How does the conductor/magnet segment (b) produce rotation devoid of an equal and opposite reaction force? By Newton's third law, it cannot do so; nevertheless, it does. So, what does the conductor/magnet segment b push against? The answer is **the ether**.

5.4 Electromagnetic Propulsion without a Propellant

Given the fact that Newton's third law forbids it, it is assumed that an object positioned in the far reaches of outer space cannot self-propel linearly without the use of propellant. The purpose of the following four examples, some of which are actual experiments, is to demonstrate that this presumption is false.

The list is given below.

- 5.4.1 Propulsion from the Rectangle
- 5.4.2 Propulsion of the Railgun; a Hypothetical Presentation of the Theory
- 5.4.3 Propulsion of the Railgun; a Practical Device
- 5.4.4 Propulsion of the Ring

5.4.1 Propulsion from the Rectangle

Structure

Before reading this section, the following website would be helpful for the nonscientist.
<http://bit.ly/2aCjS5A>

The →hypothetical← experimental device offered below consists of 14 2" x 2" square 1/8-inch-thick neodymium permanent magnets assembled in the form of a rectangle, as revealed in figures 5.28 and 5.29.

First, a photo (Figure 5.28), second a three-dimensional drawing (Figure 5.29), and finally three-view drawings (figures 5.30 through 5.32) are presented. Subsequent to this, there is a detailed written explanation of its structure, moreover, its function.

The parallel dotted lines located on the top and bottom of the rectangle in Figure 5.30 below symbolize thin metal strips sited at the junction between the adjacent attached square magnets. Then see photos (figures 5.28 and 5.33 and captions). Furthermore, as pictured, L brackets are positioned at the corners for stabilization Figure 5.28.



Figure 5.28

Photograph of multiple square neodymium permanent magnets assembled in the form of a rectangle with metal braces for stabilization placed at the angles/corners.

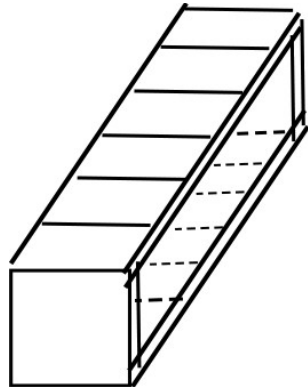


Figure 5.29 Square Magnets, Top, Bottom, and Ends

There are six attached square neodymium magnets on the top, six magnets on the bottom, and one on each end; the two long sides are open.



Figure 5.30 Top View

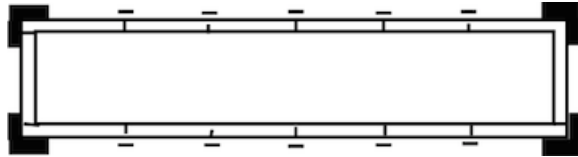


Figure 5.31 Side View

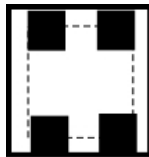


Figure 5.32 End View

The black squares depict L brackets placed at the corners and used for stabilization of the rectangle.

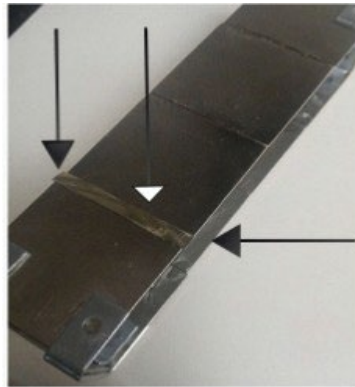


Figure 5.33 Metal Strips for Rectangular Propulsion (see arrows)

Thin metal strips are sited at the junctions of adjacent square magnets. Only one is shown above. This metal strip blocks a reversal of the magnetic field lines at that location.

Here is the written description (see figures 5.29 through 5.32 above). The assembly’s two lengths and ends are fashioned from attached square neodymium magnets, six on the top, six on the bottom, and one on each end, for a total of 14. The width of the assembly is left open (side view Figure 5.31).

The south magnetic field lines are all oriented towards the outside of the rectangle. Again, at the junction of the attached square magnets there is a small metal strip, which covers that joint (see Figure 5.33 photo). This strip blocks a reversal of the field to north in that region. Furthermore, at the corners, there are L brackets as well as plates used for stabilization.

See Figure 5.34 below. The rectangle assembly is then covered with heat-resistant electrical tape. Subsequently, peripheral to this, a two-inch-wide copper sheet is consigned surrounding the rectangle with its two ends attached to a capacitor, the latter of which is located at the top midpoint of the rectangle. After that, the copper sheet is covered with an additional second layer of heat-resistant electrical tape.

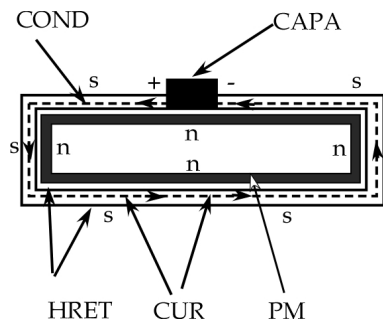


Figure 5.34 Side View of Rectangular Assembly

- *CUR = current in copper sheet.*
- *S and N = direction of magnetic field.*
- *COND = copper sheet conductor, dotted line.*
- *CAPA = capacitor, square box on top.*

- *HRET* = heat-resistant electrical tape, thin black lines.
- *PM* = permanent magnets, thick black line.
- *BLACK ARROWS* = direction of current.

See Figure 5.35 below. The rectangle is then suspended, analogous to a pendulum by using fishing lines as pictured below.

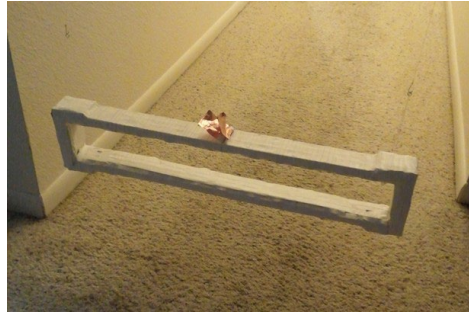
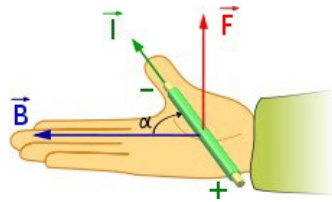


Figure 5.35 Rectangle Suspended with Fishing Lines
Note the image presented contains a different number of attached neodymium magnets, but the principle is the same.

Function

Recall the Lorentz force shown previously in Figure 5.35.



Wikimedia Commons
B = magnetic field; I = current; F = force

Figure 5.36 Right-Hand Rule [Fair Use]

Right-hand rule for a current-carrying wire in a magnetic field B.

Given the above structure, when a current passes through the copper sheet, furthermore, around the rectangular assembly from one side of the capacitor to its other side, then on all of its four sides, Lorentz forces are generated. What is more, they are all oriented in the same direction, as revealed in Figure 5.37 below.

As a result, for the duration of the current, this closed system self-propels with pendulum-like motion. So in this scenario, $F = ma$ in one direction does not have a corresponding $F = ma$ in the other direction.

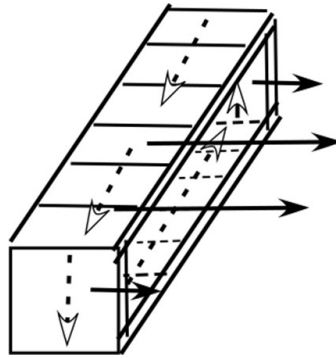


Figure 5.37 Direction of the Lorentz Forces

North magnetic field inside of rectangle.

South magnetic field outside of rectangle.

The hollow dotted arrows represent the direction of the current within the copper sheet. The solid black arrows portray the directions of all resultant Lorentz forces. Observe, they are all oriented in the same direction. The capacitor is not shown.

In fact, regarding this experiment, there are only two variables. The first is an outward-directed north-to-south magnetic field lines. The other is the current located in the copper sheet oriented perpendicular to the outward north-to-south magnetic field lines. Their interaction produces Lorentz forces which are all oriented at a right angle to both of the variables as above. See Figure 5.37 above. Discern, the resultant Lorentz forces are all oriented in the same direction. There are no other factors involved.

This description is somewhat analogous to segment b of the homopolar motor, whereby the current and magnetic field lines interact at right angles relative to one another, as depicted in Figure 5.38 below.

There is one more caveat: the internal capacitor's current must be oriented in the same direction as the current located within the copper sheet.

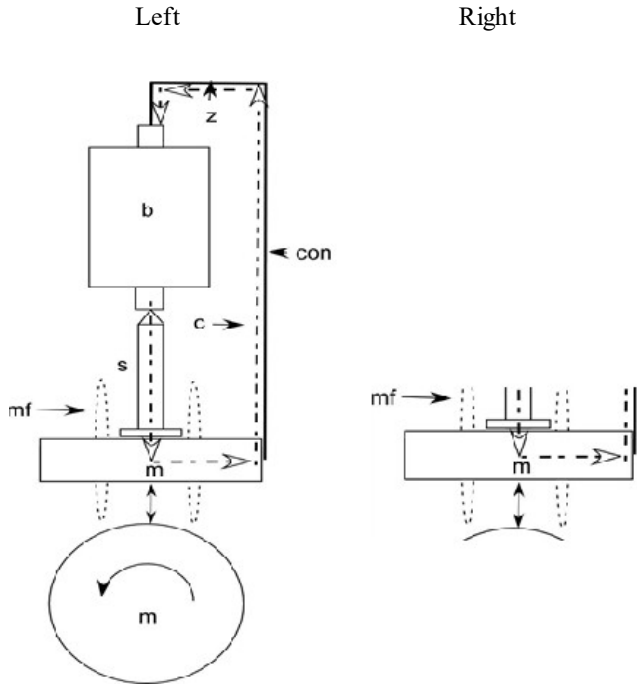


Figure 5.38 Right Side is Segment b of Homopolar Motor on the Left

Left side is an overall schematic of a homopolar motor as previously illustrated. Right side shows that specific section of a homopolar motor where the current and magnetic field interact at a right angle labeled as segment b Figure 5.26. Their interaction produces a Lorentz force, which then initiates rotation.

Now, in the scenario of the rectangle (not shown), moreover, to some extent analogous to segment b, four of these segments are assembled to form a rectangle. Observe in this setting, the resultant Lorentz forces are then all oriented in the same linear direction (Figure 5.37).

This hypothetical experiment cannot be explained using the laws of modern-day physics. It violates Newton’s third law. However, it can be understood presupposing the current induces a magnetic field, the latter of which is actually a modification of the ether. Subsequently, this modified ether (magnetic field) then interacts, at a right angle, with its own current by way of the Lorentz force, thereby producing propulsion without a propellant. In other words, the current pushes against **the ether**.

5.4.2 The Railgun, a Hypothetical Thought Model of the Theory of Electromagnetic Propulsion without a Propellant

Railguns, in contrast to artillery, depending upon on how they are constructed, can exhibit a reduction in recoil. Now, if the railgun possesses a classic breech, there is equal recoil, but if not, then there is a reduction. This later consequence in and of itself is a violation of Newton’s third law.

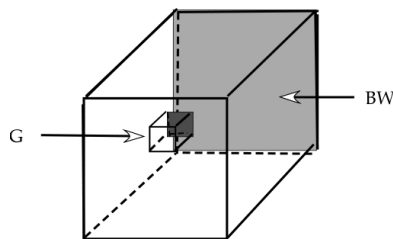
Given the presupposition as above, then a railgun properly constructed should be able to self-propel an object, in violation of Newton's third law. In order to clarify this conception, knowledge of a closed versus an open system is paramount.

For instance, a rocket located in outer space uses a propellant for propulsion. So, $F = ma$ in one direction is equal to $F = ma$ in the other direction. This is an example of an open system. In addition, a solar sail can capture the solar wind, then use it to propel a spacecraft, somewhat analogous to the wind used as the driving force for a sailboat. Again, this is an open system.

In contrast, as defined by the author, a closed propulsion system is a localized collection of matter (object) and energy that self-propels without either matter or energy leaving or entering the system. In the following paragraphs, two different scenarios of closed systems are presented, the latter of which demonstrates linear propulsion devoid of a propellant.

To start, picture in your mind a hollow cube or box that is stationary with respect to space (PFSRT). In addition, imagine in its exact center, there is a gun, whereby, by the use of braces or struts, it is attached to the two sidewalls. As a result, when discharged, it produces recoil, not only of itself but also of the entire box. Next, envision that the gun discharges a bullet directly to the center of the back wall, hits it, and then is absorbed.

Presuppose, for simplicity, that the absorption process does not reduce the force exerted upon the wall as a function of the bullet's momentum, what is more, presume no atmosphere. The device, just explained, is shown below in Figure 5.39.



Gun with bullet located at the exact center of box. Fixed attachments not shown = G

Back wall = BW

Box free floating in outer space outside a gravitational field, flat space (PFSRT)

Figure 5.39 Classic Gun/Railgun Inside a Hollow Box

Figure 5.39 portrays a hollow cube/box sited in stationary outer space (PFSRT). In addition, it contains a gun, or alternatively a railgun (not shown), attached by struts (not shown) to its exact center.

Subsequently, the gun/railgun discharges/accelerates the bullet/projectile, moreover, directly to the exact center of the gray back wall.

Referring to the following illustration, two scenarios are posed. Scenario 1 depicts a classic gun →with← recoil, whereas Scenario 2 involves a railgun →without← recoil. The hollow cube's different motions/position relative to space (ether of PFSRT) are rendered as shown.

Scenario 1 - Classic Gun (with recoil)

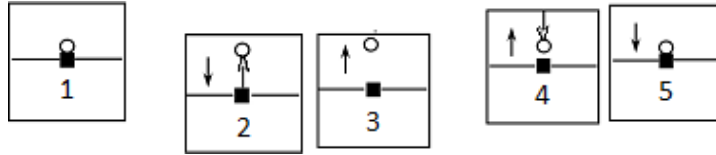


Figure 5.40 Firing Sequence of Classic Gun

1. The hollow square is a 2D representation of a 3D hollow cube or box.
2. The small solid black square positioned at the exact center of the box represents the gun.
3. The hollow circle denotes the bullet or projectile.
4. The solid horizontal black lines are side struts, which hold the gun in place.
5. The hollow-tipped vertical arrow indicates the direction of the bullet or projectile when fired/accelerated.
6. The solid black vertical arrow denotes the direction of force, oriented either towards the top of the page (+force) or else the reverse force towards the bottom of the page (-force).
7. The position of the hollow square with regard to the top and bottom of the page portrays its position relative to the space of PFSRT.

→Listed below in numerical order, moreover, in written form, is the sequence of events, 1 through 5 which correlates with the numbers in Figure 5.40←.

1. Initial orientation.
2. The gun discharges the bullet, which then produces a reverse force/momentum/time/distance upon the gun/box but only for the duration of the flight of the bullet.
3. Next, when the bullet strikes the back wall with forward force, the momentum/distance/time of 2 then ceases. So, at that occurrence, $+F = ma$ in one direction equals $-F = ma$ in the other direction (2 and 3).
4. After that, the hypothetical return of bullet off the back wall towards the gun creates an equal forward force/momentum/time/distance with respect to 2.
5. Finally, when the bullet hypothetically returns to the gun, moreover, stops with reverse force, the above momentum/time/distance of 4 then ceases, (again, $+F = ma$ in one direction equals $-F = ma$ in the opposite direction (4 and 5).
6. Referring to Scenario 1, there are two forward forces/momentum/time/distance and two reverse forces/momentum/time/distance all of which are equal but opposite in direction. (3, 4 and 2, 5).
7. Therefore, in the final analysis, concerning the cube's position relative to the space 1 (PFSRT), 1 and 5 are equivalent.
8. Take note, after all of the above, the box has returned to its original position relative to the space of PFSRT.

See Figure 5.40 above. When the bullet is discharged (2), there is a reverse force (recoil) exerted on the gun ($F = ma$). In addition, since the gun is attached to the box by struts, both obtain momentum directed towards the bottom of the page, moreover, traverse a distance over time. However, this momentum only transpires during the flight of the bullet. Next, as the bullet strikes the back wall with equal force ($F = ma$) (3), the previous induced momentum of the

box/gun ceases. This is because, at this point, $+F = ma$ in one direction equals $-F = ma$ in the other direction. There has indeed been motion of the box relative to space (PFSRT). Nevertheless, take note, the center of gravity of this closed system has been altered.

After that, if by some magic, the bullet could be projected with an equal force ($+F = ma$) from the back wall (4), furthermore, returned to the gun's chamber ($-F = ma$), as it was just before being fired (5), then both the center of gravity and position of the box/gun, relative to the space of PFSRT, will have returned to their original positions (5).

In other words, when the bullet returns to the gun, again $+F = ma$ in one direction (4) equals $-F = ma$ in the other direction (5).

This is a reversal of (2) and (3). Given that there are two forward forces, which correspond with two equal reverse forces, the box then returns to its original position with reference to the space of PFSRT.

The author points out this caveat. The two sets of opposing forces do not necessarily have to be equal; nevertheless, by including the function of time, the box will still return to its original position.

What Scenario 1 illustrates, referring to a closed system of this kind, whereby Newton's third law still applies, is this One can linearly move an object without a propellant relative to space, though only minimally, moreover, with a corresponding shift in its center of gravity. However, regarding translational motion, one cannot propel it without a repellent for a considerable distance.

Scenario 2 - Railgun (without recoil)

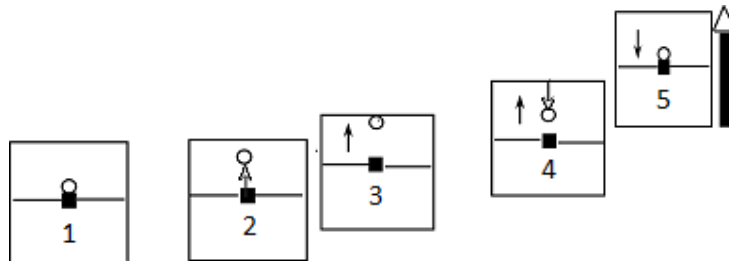


Figure 5.41 Firing Sequence of Railgun without Recoil (no breech)

1. Initial orientation.
2. The railgun accelerates the projectile; however, there is no recoil force exerted on railgun/box during the time of the flight of the projectile. As a result, the box remains stationary, again during the flight of the projectile.
3. The projectile strikes the back wall, which then produces a forward force/momentum/time/distance on the box ($F = ma$).
4. Next, the return of projectile off the back wall, without the use of a railgun, produces, again, a forward force/momentum/time/distance on the box ($F = ma$).
5. Then, when the projectile returns to the railgun, its motion ceases. This function then produces a reverse force/momentum/time on the railgun/box ($-F = ma$).
6. Take note, there are two forward forces/momentums/times (3, 4) but only one reverse force momentum/time (5). Therefore, there is an imbalance.
7. For this reason, there is then a residual forward momentum/time/distance directed towards the top of the page as depicted by the large vertical black arrow associated with 5.

See Figure 5.41 above. What transpires with the use of a railgun that exhibits reduced or absent recoil compared to a classic gun? Keep in mind, a railgun properly constructed intrinsically violates Newton's third law. For that reason, Scenario 1 does not apply.

Vis-à-vis Scenario 2: Presuppose everything is identical compared to Scenario 1, except in this setting, a railgun rather than a classic gun is used. With reduced recoil, the description is very complex, but the underlying principles of physics are identical to absent recoil. So, for sake of simplicity, presume no recoil.

With regard to Scenario 2, at time (1), all is equivalent to Scenario 1. However, at time 2, when the railgun accelerates the projectile, there is then no recoil force. As a result, the railgun/box remains immobile relative to space (PSRT) but only during the time of the flight of the accelerated object.

Subsequently, when the projectile strikes the back wall (3), there is a forward force ($+F = ma$) exerted on the wall, producing momentum/time/distance. Consequently, the box/railgun propels in the direction of motion of the accelerated object. Additionally, analogous to Scenario 1, the center of gravity has now changed.

One could, as in Scenario 1, return the projectile from the back wall to its origin \rightarrow without the use of a railgun \leftarrow , therefore producing an equal force ($+F = ma$) (4) and reverse force ($-F = ma$) (5). This dual function would also shift the center of gravity back to its original configuration.

Here is the crucial concept to acknowledge. Unlike Scenario 1, there are now two forward forces ($+F = ma$) and only one reverse force ($-F = ma$). Therefore, as a result of this imbalance, there remains a residual forward momentum of the box/railgun oriented towards the top of the page (large vertical black arrow next to box 5). Consequently, there is then continuous translational momentum of a closed system without the use of propellant.

What is more, one could repeat the same process and again accelerate the box by using the railgun, then again, and again, and so on, and so forth. This repetitive function would propel the box/railgun through space devoid of a propellant.

Remember that the opposite forces do not necessarily have to be equal; nevertheless, by including the function of time, the results are the same—residual momentum.

\rightarrow Classic modern-day physics posits that a closed system cannot exert a net force upon itself \leftarrow . Nevertheless, Scenario 2 hypothetically proves this assumption is false.

With reference to this second scenario, the most important concept to take home is that this type of railgun does not have perceived recoil; the author emphasizes "perceived." This is because it actually pushes or repels against the ether. And we do not "see" the ether with our eyes or with any of the other senses. In fact, modern-day physics presupposes it does not even exist.

However, presuming there is an ether, which functions as a part of the equal and opposite force as just hypothesized, then Newton's third law could still be correct, but not in the context in which he originally described it.

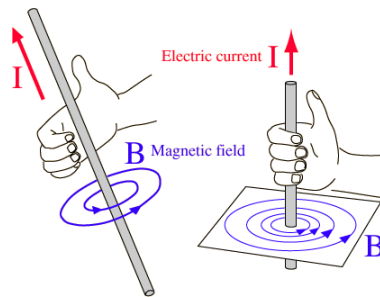
5.4.3 Propulsion of the Railgun; a Practical Device of Electrometric Propulsion without a Propellant

For the nonscientist, before reading this section, once again, reviewing the website given below would be helpful. <http://bit.ly/2aCjS5A>

This example is discussed in greater detail in Appendix F. Therefore, after reading this section, a review of that appendix might be beneficial.

As noted in the prior section, specifically Example 2, Scenario 2, the hypothetical device offered is not a practical device. Alternately, conceivably, this third example is. If one peruses the available literature, there are numerous articles which posit that the principles of physics attributed to a railgun are consistent with Newton's third law. However, other research papers postulate that if there is no breech, then the recoil of a railgun can be markedly reduced or even absent. If this is indeed true, then this fact alone is irreconcilable with Newton's third law.

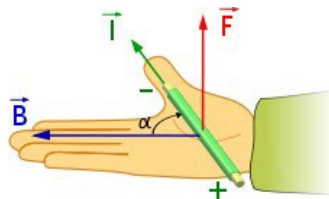
In order to grasp the function of a railgun of this latter type (no breech), once again the recognition of these two principles of physics is paramount. The first is the production of a magnetic field by a current (Figure 5.42). And the second is the Lorentz force produced by the interaction of a current with a magnetic field (Figure 5.43). Both are presented below.



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Figure 5.42 Magnetic Field and Lorentz Force Caused by Current [Fair Use]

Orientation of magnetic field relative to the direction of +current.



Wikimedia Commons

$B =$ magnetic field; $I =$ current; $F =$ force

Figure 5.43 Magnetic Field and Lorentz Force Caused by Positive Current [Fair Use]

- Right-hand rule for a current-carrying wire in a magnetic field B .
- Orientation of Lorentz force with respect to the direction of the +current as well as of the magnetic field.
- The Lorentz force is oriented at a right angle with respect to both the current and magnetic field.

Railgun Without a Breech (no recoil). The abstract, picture, figures, and discussion presented below are of an actual experimental device built for a master's thesis written by Matthew K. Schroeder at the Naval Postgraduate School, Monterey, California. The thesis is titled *An Investigation of the Static Force Balance of a Model Railgun* by Matthew K. Schroeder, June 2007. That article can be found at <http://bit.ly/2aPSfaI>.

Abstract of Thesis

An interesting debate in railgun research circles is the location, magnitude, and cause of recoil forces, equal and opposite to the launched projectile. The various claims do not appear to be supported by direct experimental observation. The goal of this research paper is to develop an experiment to observe the balance of forces in a model railgun in a static state. By mechanically isolating the electrically coupled components of such a model, it has been possible to record the reaction force on the rails and compare that force with the theoretical force on a projectile. The research is ongoing, but we have observed that the magnitude of the force on the armature is at least seventy times greater than any predicted equal and opposite reaction force on the rails.

Figures 5.44 and 5.45 portrayed below are schematics of this device.

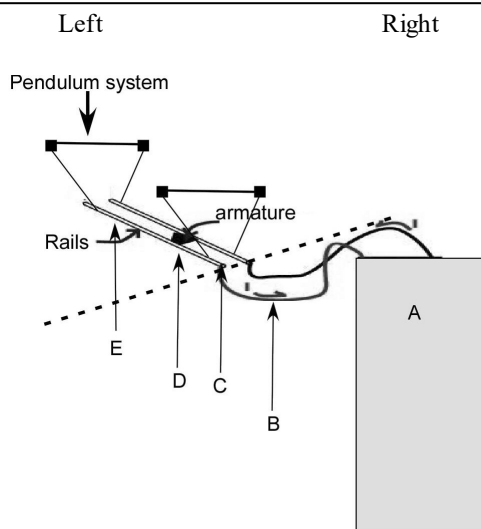


Figure 5.44 Schematic of Railgun

A = batteries, capacitors, copper wires, etc., which complete the circuit

B = copper wire conductor which delivers current to the rails. The adjacent parallel wire receives current from the rails

C = freely movable copper brush attachments that connect copper wire conductors to the rails

D = armature

E = rails

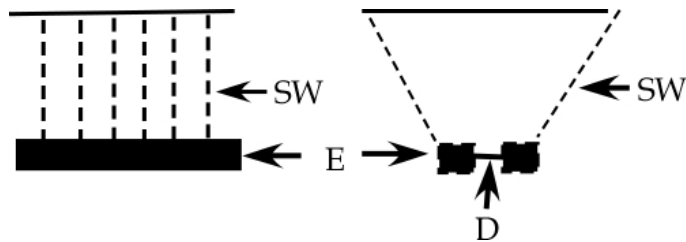


Figure 5.45 Pendulum System Suspended by Wire Cables (SW)

Images above are to the left of the dotted line of C in Figure 5.44.

See figures 5.44 and 5.45. Matthew K. Schroeder, et al, suspended an armature and two rails (E) with the use of wire cables (SW). Therefore, analogous to a pendulum, the railgun could freely swing back and forth. Next, by employing copper brushes (C), afferent and efferent copper wires, (B and adjacent parallel wire), which deliver current to and receive current from the rails, were attached to the apparatus. Brushes were utilized, because in the presence of a current, they still allowed the device to freely swing back and forth.

In addition, in one overall configuration the armature was able to independently move relative to the fixed rails and vice versa. In another arrangement, they were physically attached to one another. Furthermore, in the presence of a current, relative motion of the different components was observed and measured. What is more, there were pressure-sensitive devices that calculated the Lorentz forces generated regarding three different scenarios. These three experiments are listed below.

Experiments

1. The rails are fixed, and the armature is free to move.
2. The armature is fixed, and the rails are free to move.
3. The armature and rails are physically attached to each other, and the entire rail could freely swing back and forth just like a pendulum.

Results The following are the observed experimental results, using the same numerical values as listed above.

1. The rails remained stationary as they are fixed. The armature accelerated forward relative to the rails.
2. The armature remained motionless, since it is fixed. Even so, there was no reverse force accelerating the rails backwards; the rails remained immobile as well.
3. Both the rails and armature, which are physically attached to each other, rocked forward (accelerated) similar to a pendulum.

So what do these series of experiments demonstrate? They prove that when the armature is accelerated by force, relative to the rails, there is no reverse force exerted on the rails (1 and 2). In addition, when the entire railgun accelerated forward with pendulum-like motion, there is no perceived reverse force exerted on anything (3).

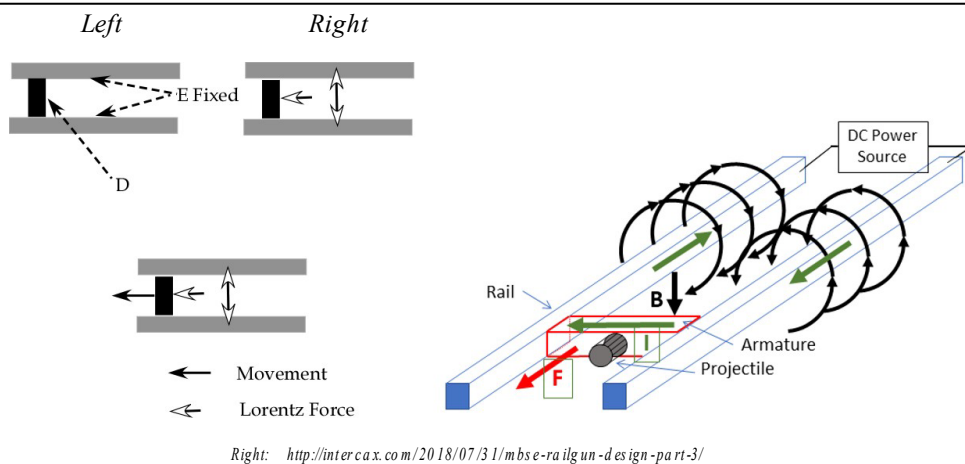
Now, concerning Scenario 3: that outcome cannot be explained by using the known laws of physics as it violates Newton's third law. In contrast, it can be understood with the presumption of an ether. And here is the rationale.

Described below is the functionality of Experiment 3. During the induction of the current, the magnetic field lines produced are greater inside the railgun compared to its outside. So, as these field lines interact with their own current, this effect produces net Lorentz forces accel-

erating the armature forward. In turn, it drags the attached rails along with its own motion. In addition, there are other symmetrical Lorentz forces attempting to split the rails apart. Nevertheless, the parallel rails are fixed to each other, so they cannot separate. Furthermore, there is no current located at the breach, as it is open. Consequently, there is no reverse breech force. Overall, this leaves only the net Lorentz forces accelerating armature forward, along with its attached rails. So what does the armature push against? —**The Ether**.

For reinforcement: here again are the explanations for experiments 1, 2, and 3, but now including pictorial form, using this basic model.

1. The rails are fixed, and the armature is free to move. (See Figure 5.46 below.)



Right: <http://intercax.com/2018/07/31/mbs-e-railgun-design-part-3/>

Figure 5.46 Rail Structure is Fixed; Armature Moves [Fair Use]

- Top left D = armature, E = rails
- Top right = Lorentz forces
- Bottom = direction of movement

- A. The armature is accelerated forward by force since everything else is fixed.
 B. In addition, there are net forces exerted on the rails that are attempting to split them apart. Nevertheless, they are fixed to one another; as such, they cannot separate. In other words, those forces are blocked.
 C. There is no Lorentz force at the open breech, because there is no physical breech.
 D. →In summary, only the armature propels forward←.

2. The armature is fixed, and the rails are free to move. (See Figure 5.47 below.)

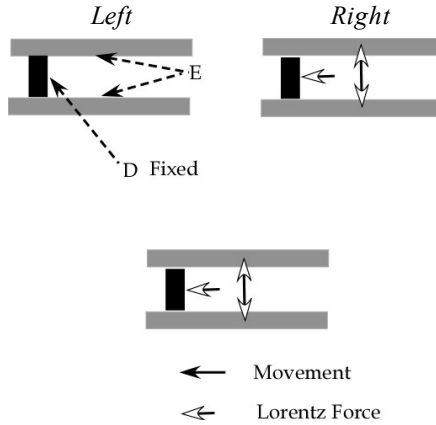


Figure 5.47 Armature is Fixed; Rails Do Not Move

- Top left $D = \text{armature}, E = \text{rails}$
- Top right = Lorentz forces
- Bottom = no movement

- A. The armature is fixed. Therefore, it cannot be accelerated forward.
 B. In addition, there are net forces exerted on the rails that are attempting to split them apart. Nevertheless, they are fixed to one another, as such, they cannot separate. Those forces are blocked.
 C. Most importantly, there is no reverse back force exerted on the rails relative to the armature. In addition, there is no force located at the breech, because there is no breech.
 D. →In summary, the entire device remains immobile←.

3. The armature and rails are physically attached to one another; moreover, the entire railgun is free to rock back and forth, just like a pendulum. (See Figure 5.48 below.)

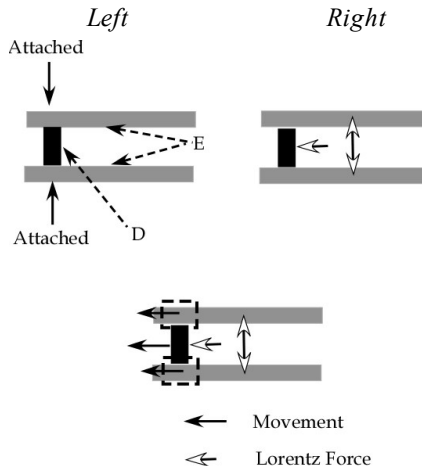


Figure 5.48 Armature and Rails Move Together like a Pendulum

- Top left $D = \text{armature}, E = \text{rails}$
- Top right = Lorentz forces
- Bottom = direction of movement
- Squares depict the physical attachments of the rails and armature

A. There is a forward net Lorentz force exerted on only the armature, which then drags the rails along with its own motion.

B. In addition, there are other net forces attempting to split the rails apart. However, they are fixed relative to one another, so they cannot separate.

C. Furthermore, relative to the armature, there is no reverse force accelerating the rails backwards.

D. What is more, no reverse force is present at the breech, because, at that location, there is no current so no breech. In essence, at that location, there is nothing for the field lines to interact with.

E. →Given all of the above, the entire railgun swings forward with pendulum-like motion←.

Now, regarding Scenario 3: Since the entire railgun rocks forward, what is it pushing against to produce an equal and opposite reaction? The answer is, again, **the ether**.

However, this interpretation may not be germane, because this device may, in fact, contain a breech. This is because during the time the railgun propels forward from force, the generator, the afferent and efferent wires, etc. could be associated with a reverse force. If this is indeed the case, there could be an equal and opposite reaction. So, in order to solve this dilemma, the following hypothetical thought experiment is proposed as revealed in Figure 5.49 below.

Presuppose a railgun is positioned in outer space with its armature physically attached to the two attached/fixed parallel rails, furthermore, containing an open breech. At the position of the breech, located between the two rails, a linear capacitor is positioned such that it spans the breech's entire length. In addition, the capacitor is constructed such that the opposite charges are separated by a large space, again equivalent to the width of the breech. The entire apparatus is a fixed rectangle with a capacitor positioned at the breech.

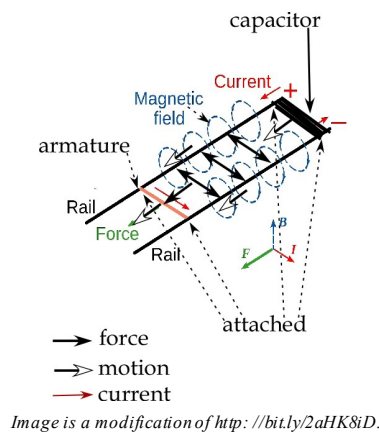


Figure 5.49 [Fair Use]

Scenario 3 in outer space (ether) with a capacitor located at its breech.

- There is a capacitor located at the breech with its opposing charges separated by a distance equivalent to the width of the breech. For that reason, there is no current at the breech. When the current

is switched on, it then interacts with its own induced magnetic field to produce the net Lorentz force as portrayed above.

- Given that the rails are fixed to each other, they do not separate. However, as shown, the armature is propelled forward by force. In addition, since the armature is physically attached to the entire railgun, it then drags it along with its own accelerated motion. Observe there is no reverse force exerted on the rails relative to the armature. And also note that there is no reverse force at the breech, as there is no current at that location.

As a result, when the device is activated, the electron current then flows through the attached rails and armature. But no current is present at the breech. For that reason, analogous to Example 3 (figures 5.48 and 5.50), the entire railgun with its attached capacitor propels forward absent a propellant. However, unlike Explanation 3, this is a definite closed system, exhibiting significant translational propulsion without a propellant, therefore, in violation of Newton's third law.

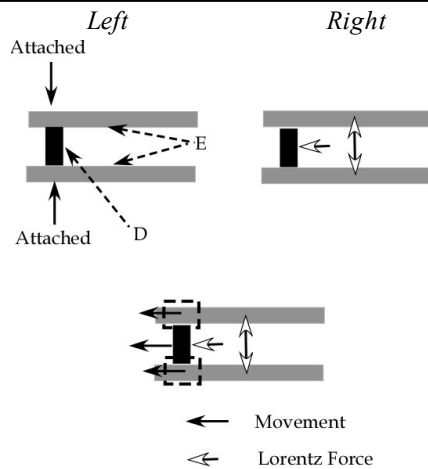
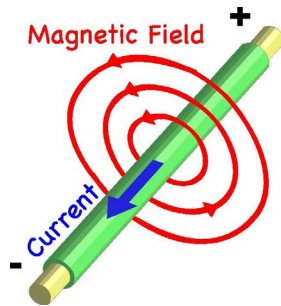


Figure 5.50 A Repeat of Figure 5.48

5.4.4 Propulsion of the Ring

For the nonscientist, before reading this section, once again viewing this website would be helpful. <http://bit.ly/2aCjS5A>. This hypothetical device is clarified in much greater detail in Appendix G. The dissertation presented below is a brief synopsis of that explanation. In order to comprehend this device, one must accept these two basic principles of physics.

- Once again, an electric current located within a linear conductor produces a circular magnetic field as shown in Figure 5.51.

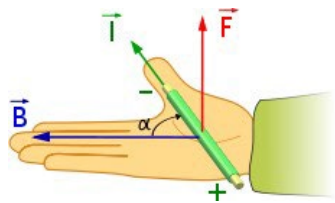


<http://commons.wikipedia.org/wiki/file:Electromagnetism.svg>

Figure 5.51 Positive Current Producing a Magnetic Field [Fair Use]

When current (I) goes through a wire, it produces a magnetic field (B) around the wire. The field is oriented according to the right-hand grip rule. An electron current would be a left-hand rule—the opposite orientation.

2. That induced field, then interacts with its own current to produce Lorentz forces, oriented at a right angle relative to both the direction of the magnetic field and the current, as shown in Figure 5.52.



Wikipedia

$B =$ magnetic field; $I =$ current; $F =$ force

Figure 5.52 Right-Hand Rule [Fair Use]

Right-hand rule for a positive current-carrying wire in a magnetic field B .

Orientation of Lorentz force with respect to the direction of the current, as well as of the magnetic field.

The intention of this section is to posit a theory of electromagnetic propulsion based upon an electric current, a magnetic field, as well as directed magnetic pulses (EMP). It is fundamentally a very simple concept based upon these three assumptions.

1. A current within a wire conductor induces a magnetic field, not only surrounding the wire but within the substance of the wire as well.
2. Subsequently, that portion of the magnetic field which is located \rightarrow within the wire \leftarrow interacts with its own current, again \rightarrow within the wire \leftarrow , to produce Lorentz forces, once more \rightarrow within the wire \leftarrow .
3. By means of magnetic flux compression technology, one can project a powerful directed magnetic pulse in a specific direction, analogous to a gun.

These three assumptions will be used to posit a hypothetical electromagnetic propulsion device. Due to the complex three-dimensional nature of this concept, it is considerably easier to explain this model if one uses diagrams. For that reason, five diagrams will be presented.

Each diagram will present a concept that will lead to the next diagram, until finally, the concept of electro-magnetic propulsion is explained. The five diagrams are listed below.

1. A single straight wire conductor with a current.
2. Two straight wire conductors with both currents flowing in the same direction.
3. Two straight wire conductors with their currents flowing in opposite directions.
4. A single circular wire conductor (ring) with a current.
5. A single circular (loop) conductor (ring) with a current, along with its induced magnetic field. The latter of which, relative to the plane of the ring, is distorted on one side by a directed magnetic pulse. For that reason, there is electromagnetic propulsion. Below are the five diagrams with explanations.

They describe, as well as illustrate, electromagnetic propulsion without the use of a propellant.

(1) See **Figure 5.53 below** illustrating a single straight wire conductor with its current flowing into the page. The wire with its current induces a circular magnetic field, not only surrounding the wire but also within its own substance. Subsequently, that portion of the magnetic field, which is located within the body of the wire, then interacts with its own current to produce the Lorentz forces as depicted in Figure 5.53. Notice, both the density of the magnetic flux and the direction of the Lorentz forces, are symmetric with respect to the wire's diameter.

Furthermore, the Lorentz forces are oriented symmetrically in a circle towards its center. This process produces electromagnetic propulsive forces. Nevertheless, due to the above symmetry, these forces are balanced. As a consequence, there is no motion or propulsion. On the other hand, if these forces were somehow asymmetrical rather than symmetrical, there would be propulsion. Nonetheless, this is not the case.

In this and subsequent diagrams, the overall Lorentz forces will be divided into separate vector forces relative to the X (+x,-x) and Y (+y,-y) axes and additionally, with respect to the later figures in the Z axis. For example, in this Figure 5.53, the Lorentz forces counteract each other in both the X and Y axes. However, in reality, all the Lorentz forces are oriented symmetrically in a pattern of a circle towards the wire's center.

As such, they again neutralize each other. In both instances, there is no propulsion as these forces are balanced. The two scenarios are analogous to each other. The author has chosen this method of explanation, so one can easily envision the concepts. Otherwise, the diagrams and description will be too complex to comprehend.

Alternatively, if the conductor is curved or angled (Figure 5.54), the Lorentz forces are asymmetrical, being greater within the conductor with respect to its concave side compared to the convex side. Therefore, when a current is present, moreover, if the wire is free to unfold, the conductor straightens out. The question then is: While in the process of unbending or straightening out, what is the conductor pushing against to do so? Effectively, this is electromagnetic propulsion without a propellant. It violates Newton's third law.

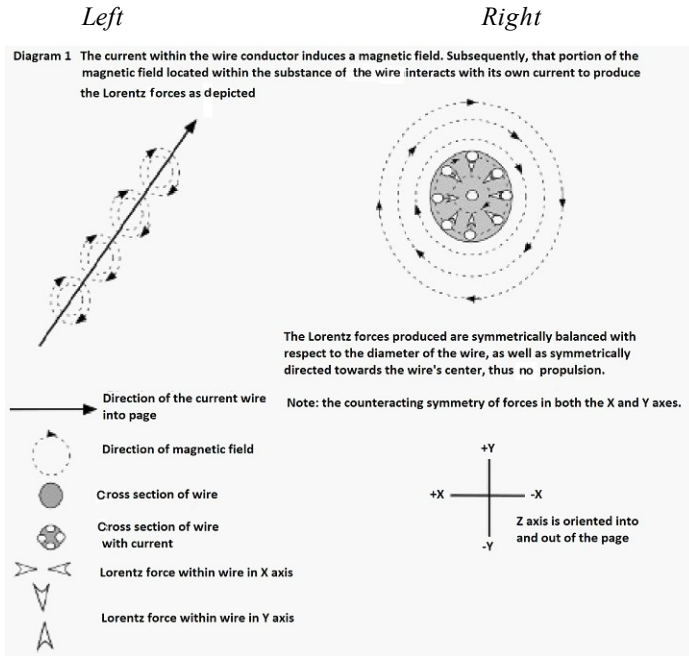


Figure 5.53 Magnetic Field Inside the Wire Produces Symmetrical Lorentz Force

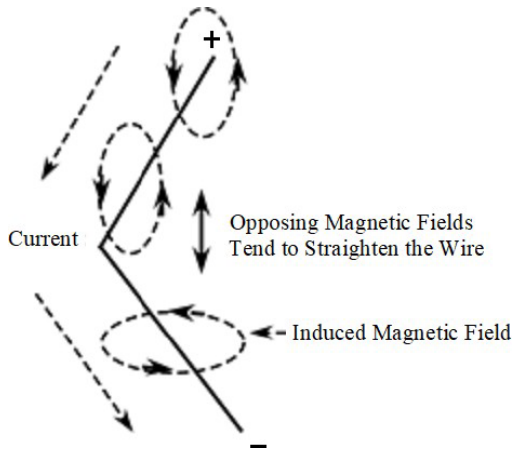


Figure 5.54 Right-Angle Bend Produces Asymmetrical Lorentz Force

A wire with a perpendicular bend will have an increasingly strong moment to straighten with an increasing magnitude of applied current.

However, once the conductor straightens, the Lorentz forces are, at that time, symmetrical relative to the axis of the wire, so no further movement is observed.

(2) See Figure 5.55 below that depicts two straight wire conductors with both currents flowing into the page. Each separate wire, with its current, induces its own magnetic field, not merely surrounding itself, but also within its own substance.

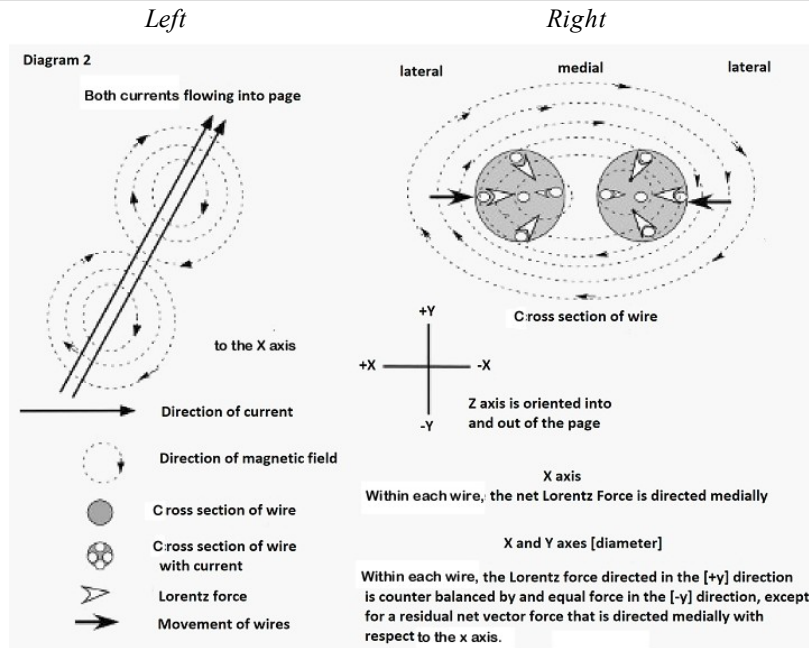


Figure 5.55 Combined Magnetic Fields Cause Attraction

As illustrated in Figure 5.55, the two magnetic fields interact to create one overall modified field.

Subsequently, that portion of this one modified field, which is located within the body of each wire, interacts with the current in that same wire to produce the Lorentz forces as illustrated. Notice, with respect to each wire, the density of the magnetic flux in the X axis (+x versus -x directions) is asymmetrical, moreover, greater laterally compared to medially. As a result, the →net← Lorentz force that is directed medially is greater compared to the force which is directed laterally.

And, relative to each wire, the density of the magnetic flux takes the form of a mirror-image symmetrical pattern, in the X and Y axes (diameter) relative the X axis.

Consequently, the resulting Lorentz forces neutralize one another, except for a residual vector directed medially.

Therefore, overall, relative to each wire, the direction of the →net← Lorentz force is medial, and as a result, the wires propel towards each other. This process is actually electromagnetic propulsion, nevertheless impractical, given that once the wires are in contact, all motion ceases. Make a note, outside the substance of the wires in the region of the interacting magnetic fields, there is no force. Forces are located only within the body of the wires, where the one modified magnetic field interacts with each of the two currents.

(3) See Figure 5.56 below which illustrates two straight wire conductors with opposing currents. The left current is flowing out of the page, whereas the right current is flowing into the page. Each current induces its own magnetic field, not only surrounding itself but within its

own substance as well. The two magnetic fields interact and form two separate modified fields, as depicted in Figure 5.56.

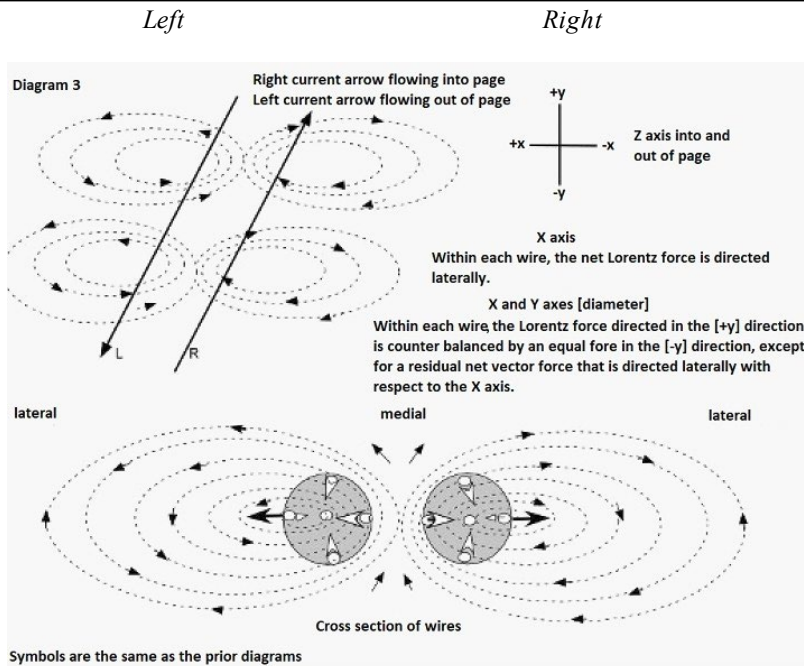


Figure 5.56 Opposing Magnetic Fields Cause Repulsion

Subsequently, that portion of each modified field, which is located within the body of its own wire, interacts with its own current, again in the wire, to produce the Lorentz forces as illustrated. Notice, relative to each wire, the density of the magnetic flux in the X axis (+x and -x directions) is asymmetrical, moreover, greater medially compared to laterally. Therefore, the →net← Lorentz force that is directed laterally is greater compared to the force which is directed medially.

Observe as well, relative to each wire, that the density of the magnetic flux takes the form of a mirror image symmetrical pattern, in the X and Y axes (diameter) relative to the X axis. Therefore, overall, the Lorentz forces neutralize each other, except for a residual vector directed laterally.

Consequently, with respect to each wire, the direction of the →net← Lorentz force is lateral; as such, the wires propel away from each other. Once again, outside the substance of the wires in the region of the interacting magnetic fields, there is no force. Force is located only within the body of each wire, where the current within that wire interacts with its own associated modified magnetic field. This process is electromagnetic propulsion, though again, impractical, since once the wires travel a given distance from each other, the two magnetic fields will cease to interact. Subsequently, each will transform into a single wire as depicted in Figure 5.53. Nevertheless, the two wires possess residual momentum.

(4) See **Figure 5.57** below which illustrates a current in a single circular (loop) conductor. In future deliberations, this structure will be defined as the ring. The shape of the magnetic field created by this current is equivalent to the classical magnetic field induced by a loop current, as depicted in Figure 5.57.

The ring with its current produces a magnetic field not just surrounding itself, but also within its own essence. Subsequently, that portion of the magnetic field, which is located within the body of the ring, interacts with its own current, again, within the wire, to produce the Lorentz forces as depicted.

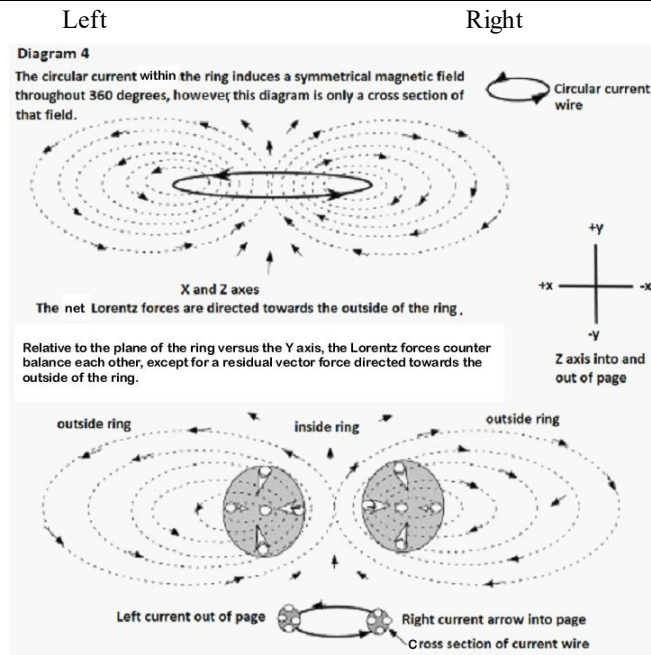


Figure 5.57 Magnetic Field of Ring Causes No Movement

Notice, relative to the plane of the ring (X and Z axes), the density of the magnetic flux is asymmetrical, moreover, greater within the inner side of the ring compared to its outer side. Therefore, throughout 360 degrees, the Lorentz forces that are directed towards the outside of the ring are greater compared to those forces which are directed towards its inside.

Discern as well, relative to the plane of the ring versus the Y axis, the density of the magnetic flux, within the ring, takes the form of a mirror image symmetrical pattern. Therefore, throughout 360 degrees, the Lorentz forces neutralize each other, except for a residual vector, directed towards the outside of the ring.

Observe, with respect to the plane of the ring, the overall \rightarrow net \leftarrow Lorentz forces are directed symmetrically and equally outward, throughout its circumference. Nevertheless, the ring is a physically intact structure; accordingly, it blocks these forces.

Essentially, all the Lorentz forces produced within the ring are either blocked by its solid structure, or they neutralize one another. As such, there are no unbalanced forces.

Consequently, as previously depicted in Figure 5.53, there is, a gain, no propulsion. Alternatively, if the Lorentz forces were somehow asymmetrical with respect to the plane of the ring, there would be propulsion. Commit this last concept to memory.

(5) **See Figure 5.58 below.** In order to comprehend this last and crucial diagram, one must appreciate the concept of magnetic flux compression producers. This apparatus produces an extremely powerful **directed** magnetic pulse, which can be used as a military weapon, analogous to a gun. However, in this situation, it produces electromagnetic propulsion.

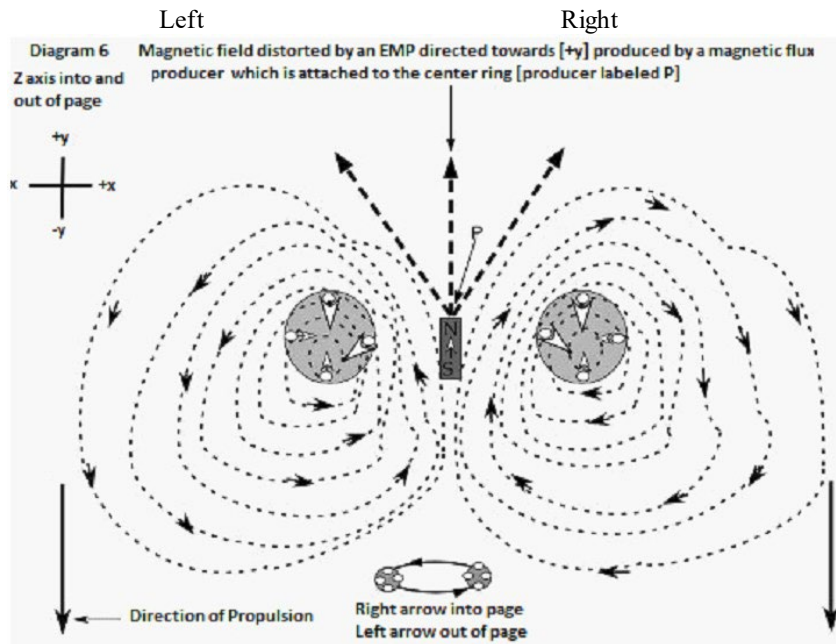


Figure 5.58 Magnetic Flux Compression Causes Propulsion

Recall in Figure 5.57, that relative to the plane of the ring, (X and Z axes), the \rightarrow net \leftarrow Lorentz forces are directed, throughout its circumference, towards the outside of the ring. Nevertheless, the ring remains intact. As a consequence, there is no propulsion. Recollect as well, relative to the plane of the ring, versus the Y axis (throughout the ring), there is mirror-image symmetry of the Lorentz forces. As a result, they neutralize one another, with the exception of a residual vector, oriented towards the outside of the ring, again blocked by its intact structure. So, overall, there is no propulsion.

Fundamentally, with reference to Figure 5.57, there are electromagnetic propulsive forces produced within the ring; nevertheless, they are either blocked by its intact structure, or they counteract one another. Essentially, there are no unbalanced forces and so, no propulsion.

Now, imagine that from an attached magnetic flux compression producer located at the ring's exact center, that a single symmetrical magnetic pulse is emitted (Figure 5.58). Additionally, assume the pulse is directed axially towards one side, moreover, relative to the plane of the ring ($+y$). Therefore, for an extremely brief period of time, this pulse will symmetrically distort the shape of the magnetic field on that side. The other side may change symmetrically as well, but the two halves are asymmetrical with respect to each other.

Thus, with respect to the plane of the ring versus the Y axis, the mirror-image symmetry previously depicted in Figure 5.57 is lost, as now depicted in Figure 5.58.

Observe, at this instant in time, relative to the plane of the ring, there are symmetrical \rightarrow net \leftarrow vector forces, throughout its circumference, directed towards the outside of the ring, which are neutralized by its intact structure. However, most importantly, there are now other \rightarrow net \leftarrow vector forces throughout its circumference directed towards the bottom of the page ($-y$) that are not neutralized. Given that these latter forces are unbalanced, with respect to the Y axis, there is electromagnetic propulsion towards the bottom of the page.

All five of the electromagnetic propulsion figures presented in this section are more easily understood if one assumes the existence of an ether. So let's explain this assertion.

Fundamentally, the current creates a magnetic field. The magnetic field is a modification of the ether. For that reason, when the current and the modified ether interact, they push against one another at a right angle, so during each pulse, there will be electromagnetic propulsion of the ring towards the bottom of the page (-y).

Summary

A single circular loop conductor (ring) with its current induces a magnetic field, not only surrounding the ring but also within the substance of the ring. Subsequently, that portion of the magnetic field, which is located within the body of the ring, interacts with its own current to produce Lorentz forces.

Electromagnetic propulsive forces are produced from this process. However, these forces are either blocked by the intact structure of the ring, or they are symmetrically oriented in opposing directions. As such, these latter forces counteract each other. Essentially, all the forces are balanced, and consequently, there is no propulsion of the ring.

However, if the magnetic field, relative to one side of the plane of the ring is symmetrically distorted by a directed magnetic pulse, then for the duration of this pulse, there will be Lorentz forces within the ring, some of which are not blocked by its physical structure, nor annulled by opposing symmetrical forces. Accordingly, these forces are unbalanced. As a result, there will be electromagnetic propulsion of the ring along its axis depicted by the long downward vertical solid arrows in Figure 5.58.

This function results in propulsion without a typically defined propellant. So, according to this new conception, the current and the ether push against one another at a right angle, and this interaction is the equal and opposite reaction. This is not exactly Newton's theory, but close. In the author's opinion, the major reason why these forms of propulsion devices are never even considered is that without the presumption of the ether, concepts like those just described do not even enter our minds. And if they do, they are rejected, because they violate the supposed irrefutable laws of physics.

Therefore, these so-called "laws" have confined us into a closed dark box. As a result, our thinking and creativity become restricted.

Alternately, if all these devices work as advertised, then it is time to totally rewrite physics. Moreover, in the future, if we do so, let us not close and seal the box. In other words, to pursue reality, keep the box open, and let the light of truth shine in.

5.5 The Permanent Magnetic Motors

The framework of this subdivision is as follows:

- 5.5.1 The Merging of Electromagnetism with Permanent Magnetism
- 5.5.2 The Circular Permanent Magnetic Motor
- 5.5.3 The Shielded Permanent Magnetic Motor

5.5.1 The Merging of Electromagnetism with Permanent Magnetism.

A review of the classic physics of electro-magnetism is presented in the following website.
<http://bit.ly/1xOBK5N>

Before explaining these two different types of permanent magnetic motors, first, the underlying physics of electromagnets (EM) and permanent magnets (PM) are examined. As with the rest of this publication, these explanations differ from accepted theories, moreover, are quite

lengthy. Nevertheless, the descriptions are necessary, if one wishes to understand these devices. To introduce the theory, first a series of five seemingly disparate physics concepts are presented.

However, after proceeding, one will eventually come to realize that they are, in fact, inter-related with one another, what is more, how ultimately, they are weaved together to explain the function of these two types of novel motors. So, to begin, here is the outline, then the explanation of the five concepts.

1. Solenoid / Electromagnet (EM)
2. Earth's Magnetic Field
3. Permanent Magnet (PM)
 - a. Classic Theory of the Physics of a PM
 - b. Alternative Theory of the Physics of a PM
4. The Internal Lorentz Forces of Both a PM and an EM
 - a. Internal Lorentz Forces of a Solitary EM
 - b. Internal Lorentz Forces of Single PM
5. Interacting PMs

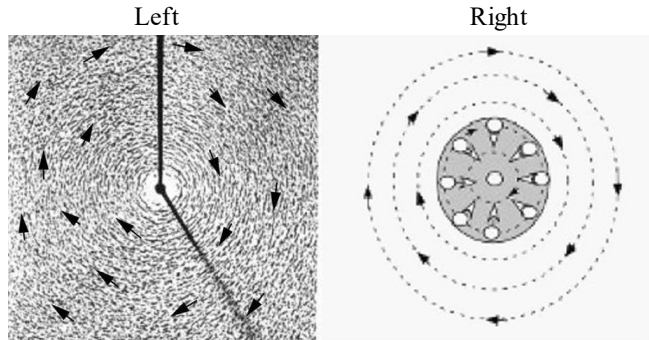
Later on in this chapter, these concepts will be used to explain the function of these two types of motors.

(1) Solenoid / Electromagnet (EM)

For a video review of the classic explanation of the production the magnetic field of a solenoid, see the website cited below:

<http://bit.ly/1xOBK5N> from 9 minutes to 19 minutes 15 seconds.

For future reference, regarding this chapter, the terms solenoid and an electromagnet (EM) are assumed to be synonymous. Now, please refer to Figure 5.59, moreover, the following caption and discussion.



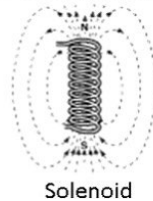
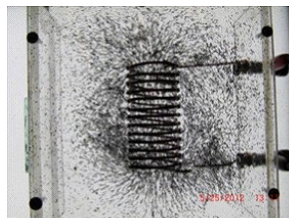
Wikimedia Commons

Figure 5.59 A Straight Wire Conductor [Fair Use]

- The picture to the left shows the external magnetic field induced by a straight wire conductor painted by iron filings.
- The schematic to the right demonstrates that the magnetic field generated by the current not only surrounds the conductor wire but also exists within its own substance.
- The hollow-tipped arrows on the right depict the direction of the Lorentz forces located within the wire, as a function of the current interacting with its own induced magnetic field.

A straight wire conductor containing a current produces a circular magnetic field, not only surrounding the wire but also within its own substance. The induced magnetic field then interacts with its own current, \rightarrow within the conductor \leftarrow , to generate Lorentz forces, moreover, all oriented symmetrically towards the wire's center as revealed in Figure 5.59 above.

See Figure 5.60 below. Now, if the very same conductor is made into a solenoid, the configuration of its magnetic field is that of a classic dipole with a north and south pole. Again, there are Lorentz forces generated as with the straight wire conductor, but they are more complex and will be discussed later in this chapter.



Solenoid

Top: University of Michigan - Bottom: Hyperphysics

Figure 5.60 Electromagnet with its Magnetic Field [Fair Use]

(2) Earth’s Magnetic Field

For a video review of the classic explanation of the production of the Earth’s magnetic field, see the website cited below:

<http://bit.ly/1xOBK5N> from 0 to 9 minutes 15 seconds.

Now refer to figures 5.61 and 5.62, as well as the following explanation.

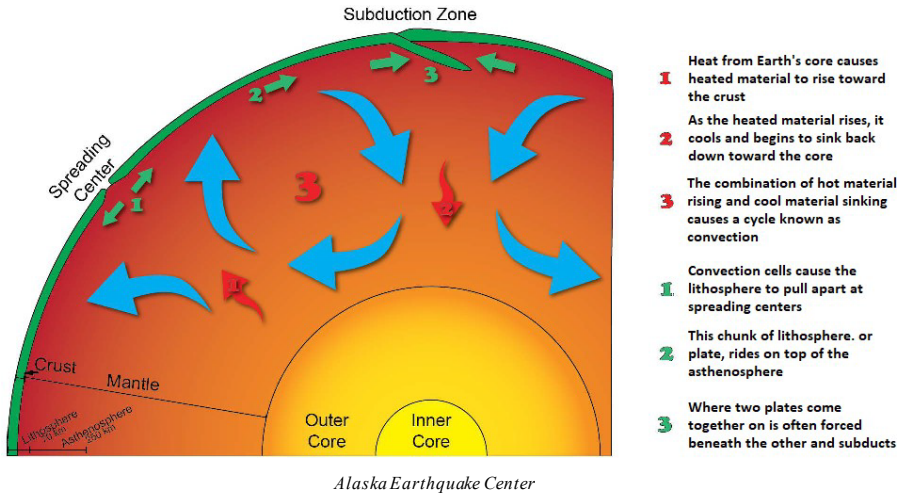
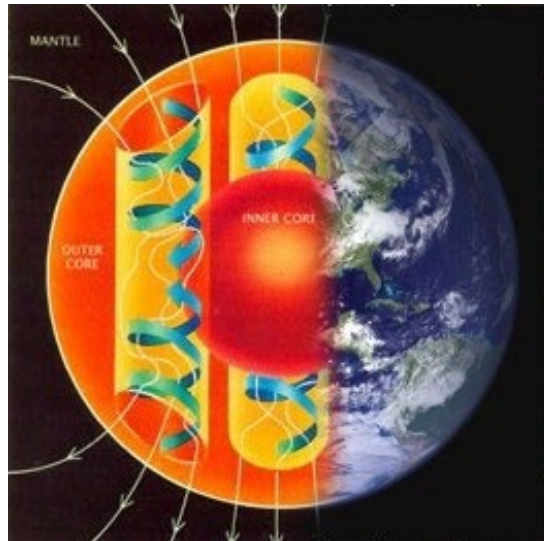


Figure 5.61 Convection Currents in Earth [Fair Use]

In Earth’s mantle, convection currents, as shown above, transfer large amounts of heat. Heat from the core and the mantle itself causes electric convection currents in the mantle. These convection currents cause the Earth’s magnetic field. [Source for caption only: <http://bit.ly/2b2Pjbf>]

The Earth as a Magnet



kjmagnetics.com

Figure 5.62 Dynamo Mechanism [Fair Use]

*Illustration of the dynamo mechanism that creates the Earth's magnetic field: convection currents of magma in the Earth's outer core, driven by heat flow from the inner core, organized into rolls by the Coriolis force, creates circulating electric currents, which generate the magnetic field. [Source: *kjmagnetics.com*]*

Purportedly, from the literature, the Earth's magnetic field is formed by the summation of numerous very large, similarly oriented electron convection currents. These are found deep within the Earth's crust, or alternatively, within the outer portion of its molten core.

So, as portrayed in figures 5.61 and 5.62 above, moreover, Figure 5.63 below, the generation of the Earth's magnetic field is analogous to multiple extremely large solenoid electromagnets, the sum of which then produces the Earth's overall dipole field.

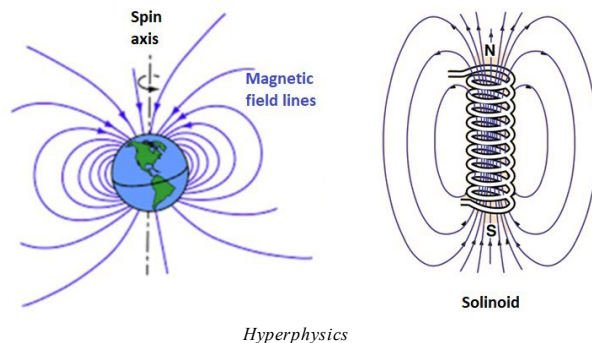


Figure 5.63 Magnetic Field of the Earth and the Electromagnet [Fair Use]

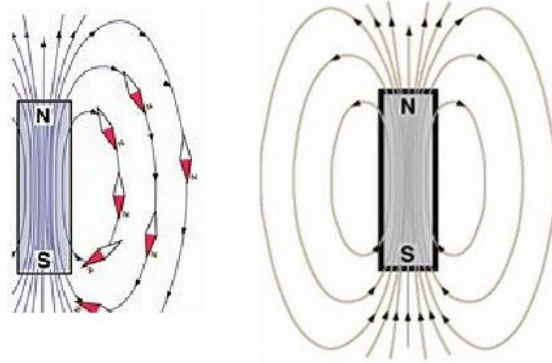
As illustrated above, the production of Earth's magnetic field and the induction of the magnetic field by a solenoid are produced in exactly the same manner.

(3) Permanent Magnet (PM)

Please refer to figures 5.64 and 5.65 as depicted below, furthermore, the following explanation. Observe that the overall configuration of the dipole magnetic field of a solenoid and the dipole of a PM appears to be identical. The following paragraphs will explain the rationale as for the reason why.

(a) Classical Theory of the Physics of a PM

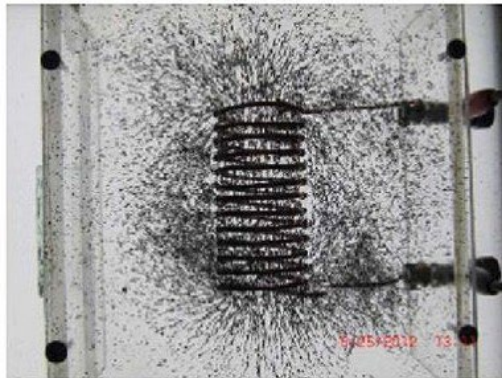
Compared to a solenoid, the production of the magnetic field of a permanent magnet now labeled (PM) is posited to involve a completely different mechanism. The standard theory presupposes that within the substance of a PM, the unpaired outer shell electrons are all aligned in exactly the same direction. Additionally, since each unpaired electron is a small dipole, the summation of all similarly aligned unpaired dipoles produces the overall PM's magnetic field. Furthermore, all other randomly oriented dipole electrons, located within the PM's substance, counteract and therefore, neutralize one other.



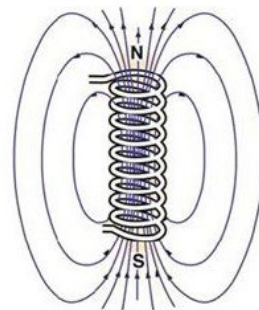
Hyperphysics

Figure 5.64 Dipole of a Bar Magnet [Fair Use]

The schematics portrayed above in Figure 5.64 demonstrate that the dipole of a bar magnet in this figure is analogous to the dipole of a solenoid in Figure 5.65 below.



University of Michigan



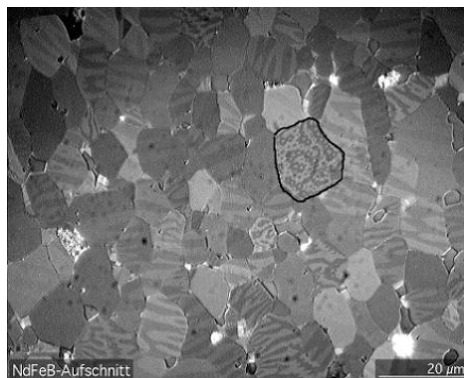
Solenoid

Hyperphysics

Figure 5.65 Dipole of an Electromagnet [Fair Use]

The schematics and the photo portrayed above in figures 5.64 and 5.65 demonstrate again that the dipole of an electromagnet (lower) is analogous to the dipole of a PM (upper).

Nevertheless, all is not clear-cut. As it turns out, the overall magnetic field of a PM is a product of numerous microscopic subunits called magnetic domains. Refer to Figure 5.66.



Wikipedia

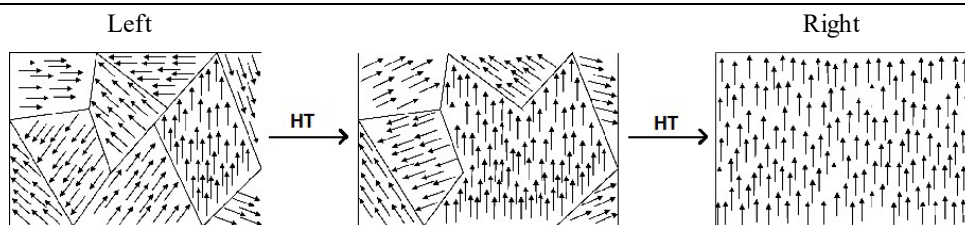
Figure 5.66 Grains of NdFeB with the Magnetic Domains [Fair Use]

Pictured above are several grains of NdFeB with the magnetic domains made visible via contrast with a Kerr microscope. [Source: Wikipedia]

Fundamentally, each domain corresponds to a small EM possessing a north and south pole. In addition, the magnetic fields produced by all of the individual domains combine to form one overall dipole-shaped field. This is the PM's overall magnetic field.

The domains of a PM are, by and large, fixed in a given direction; therefore, there is a stable overall magnetic field. Alternatively, within a ferromagnet (FM), they are oriented in a specific direction, only in the presence of an externally applied magnetic field. However, if this field is removed, then over time, the alignments diverge, moreover, become random. For that reason, the ferromagnet loses its overall magnetic field.

Please refer to Figure 5.67 below and the following discussion.



Wikipedia

Figure 5.67 Increasing Magnetic Field Increases Magnetic Domains [Fair Use]

The domains of a ferromagnet are not fixed structures, given that they are malleable. For instance, an individual domain consists of similarly aligned unpaired outer shell electrons. Moreover, under the influence of an external magnetic field, each domain can incorporate into its own structure additional electrons, thus grows physically larger. Simultaneously, the domains reorient their poles, so that they are aligned along with the axis of the externally applied magnetic field.

This function is depicted in Figure 5.67 above. The blocks of arrows correspond to the domains. Notice, as the externally applied field increases from left to right, the domains grow

progressively larger and, moreover, concurrently, they increasingly become oriented along the same magnetic axis as compared to the external applied field.

Conversely, with the loss of influence of an external field (right to left), they lose electrons, thus become physically smaller, and at the same time, assume a more random orientation.

(b) An Alternative Theory of the Physics of a PM

The overall magnetic field of a solitary PM is a dipole, furthermore, made from the summation of all the individual domains of that magnet. Therefore, by logic, there are only two options.

The first is within each domain, the magnetic field is a function of similarly aligned outer-shell unpaired electrons. And for the second, within each domain, the field represents similarly aligned "solenoid-like" circular electron currents. If this dichotomy is not the case, then what other option is there?

→For that reason, this new theory posits that the domains of a ferromagnet (FM) as well as of a PM are comprised of "crystal-like groups" of unpaired outer-shell electrons traveling in a circumferential pattern analogous to a solenoid←. And so, with respect to an FM, just like the standard theory, these circular currents can add or lose electrons depending upon external influences. Therefore, they can change their size, shape, and orientation under the influence of an externally applied magnetic field or from the presence of other adjacent domains.

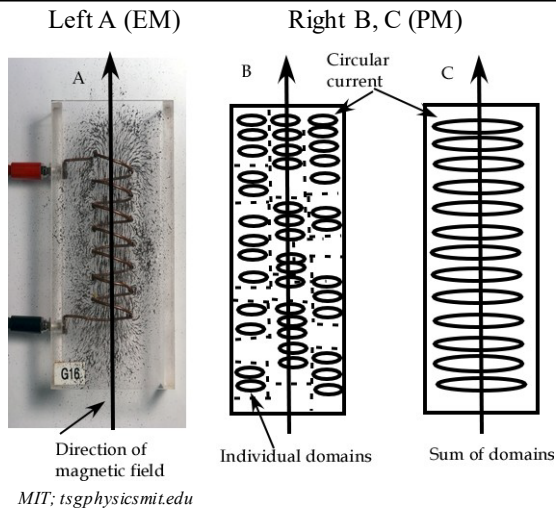


Figure 5.68 Electromagnet (EM) Permanent magnet (PM) [Fair Use]

In contrast, compared to an FM, the crystal-like circular currents located within the domains of a PM are generally fixed in a given direction. Even so, under the influence of a very strong external magnetic field, they behave somewhat analogous to an FM. Nevertheless, in contrast to an FM, when the very intense external field is removed, the PM's intrinsically generated magnetic field resumes its original shape.

Refer now to Figure 5.68 and the following discussion. As portrayed in Figure 5.68, this alternative model posits that the domains of a PM are actually stacks of parallel superconducting circular electron currents, (B in Figure 5.68) to some extent analogous to a solenoid, (A in Figure 5.68). In essence, the sum of the circular currents of B then produces the PM's overall magnetic field (C in Figure 5.68). This transformation from B to C is analogous to the gen-

eration of the overall magnetic field of the Earth as a product of summation of its individual electron convection eddy currents.

Now refer to Figure 5.69 below.

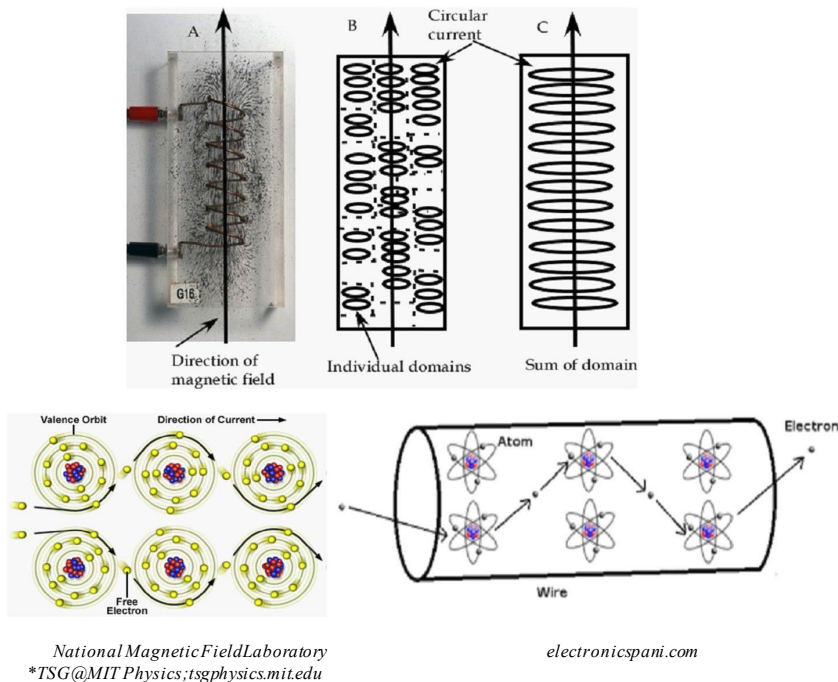


Figure 5.69 Electrons Moving from Atom to Atom [Fair Use]

The two side-by-side images directly above demonstrate outer-shell electrons traveling from one atom to the next adjacent atom and so on. →This is a net current since the electron orbit the nuclei very rapidly but travel from atom to atom very slowly←.

Explained with greater detail, this new theory (Figure 5.69) hypothesizes that within each domain, the outer-shell unpaired electrons, travel from one atom (neodymium) to the next adjacent atom, moreover, in a circumferential pattern, accordingly, creating a circular electron current. The individual circular elements are stacked one on top of another; (B in figures 5.68 and 5.69) just as multiple permanent ring magnets will intrinsically stack, assuming similarly aligned poles. The sum total of all these individual domains then produces the PM’s overall magnetic field (C in figures 5.68 and 5.69).

In summary, and again for emphasis, each domain of a PM consists of stacks of parallel superconducting circular electron currents, somewhat analogous to a solenoid. In addition, most of the domains are oriented permanently along the same axis. As a result, there is a persistent, generalized, overall magnetic field, defined in classical terms, as a PM with a dipole.

So what evidence is there which indicates that this postulate is correct? Listed below are two observations which provide support for that idea.

First Observation

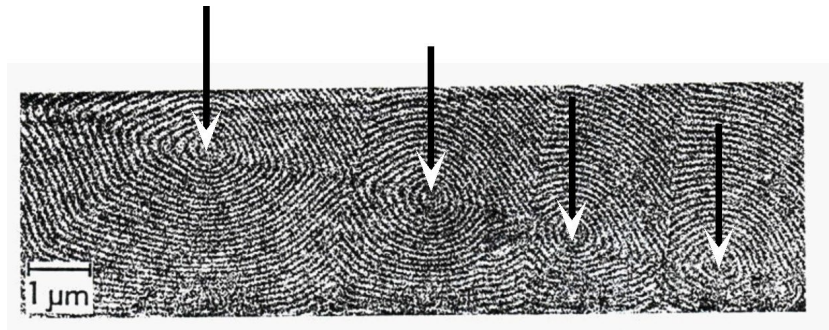
The outer-shell electron structures of both a PM (neodymium) and a metal conductor, such as copper are very similar. For instance, the best metal conductors possess unpaired outer-shell electrons, comparable to a PM (neodymium). Therefore, within the metal conductor, or else on its surface, the outer-shell electrons sequentially travel from one atom to an adjacent atom and so on. Likewise, this new theory posits that the same function also occurs within the domains of a PM. However, the main dissimilarities are first, the electron current within a metal conductor travels linearly, whereas the electron current of the PM travels in a circular pattern limited by the walls of its own domain. In addition, the current within the metal conductor requires a voltage, whereby the current, located within the domain of a PM, must be superconducting, given that it is persistent, devoid of input of energy (voltage), moreover, with no production of heat.

To recap, the resemblance of the outer-shell electron structures of both a PM and a metal conductor leads credence to this new postulate, for comparable electron arrangements should correlate to similar electron functions.

Second Observation

In order to provide further evidence, the following five magnetic field images are presented. They illustrate that the physical appearance of the magnetic field produced within a permalloy (permanent magnet) is analogous to the appearance of a magnetic field generated by a solenoid. The list of images to be offered is as below.

- Image 1. A permalloy (permanent magnet)
- Image 2. A straight-wire conductor
- Image 3. A wire loop conductor
- Image 4. A permanent magnet
- Image 5. A solenoid



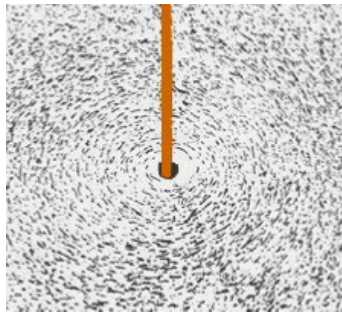
Akira Tonomura

Figure 5.70 Image 1 - A permalloy (Permanent Magnet) [Fair Use]

- This image depicts the appearance of a magnetic field located within a permalloy painted by electrons. The image is from the book *The Quantum World Unveiled by Electron Waves* by Akira Tonomura, (Page 77); the image is copyrighted.
- The author's interpretation as to what this photo represents does not correspond with the assertions presented within that article.

Image 1 in Figure 5.70 above shows the shape of the magnetic field located within a permalloy. A permalloy is analogous to a PM. Observe, there are multiple adjacent circumferential-shaped magnetic field lines, each of which surrounds a central core (see arrows).

Image 2 in Figure 5.71 below depicts a straight wire conductor, containing a current, furthermore, the configuration of its magnetic field. Observe, Image 2 is analogous to the individual circular sub-units in Image 1 (PM).

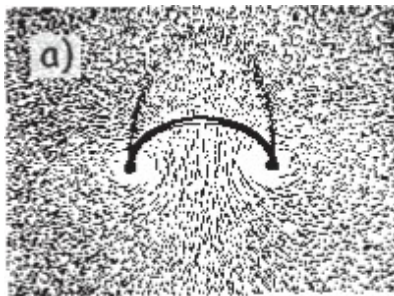


School for Champions, Ron Curtus:

https://www.school-for-champions.com/science/magnetic_field_moving_charges.htm#.X4stV2WofzI

Figure 5.71 Image 2 - A straight wire conductor [Fair Use]

Image 2 illustrates the shape of a magnetic field painted by iron filings produced by a current located within a straight wire conductor.



Semantics Scholar: [https://www.semanticscholar.org/paper/Magnetic-augmented-rotation-system-\(MARS\)-and-Liu/96e8416b2b79ed998f09aa7b6fdccd6690b82284/figure/3](https://www.semanticscholar.org/paper/Magnetic-augmented-rotation-system-(MARS)-and-Liu/96e8416b2b79ed998f09aa7b6fdccd6690b82284/figure/3)

Figure 5.72 Image 3 - A Wire-loop Conductor [Fair Use]

Image 3 illustrates the configuration of the magnetic field painted by iron filings induced by a wire-loop conductor with a current.

Image 3 above illustrates the shape of the magnetic field produced by an electron current in a wire loop conductor. Once again, observe the similarity of this Image 3 compared to Image 1 (PM), whereby there are multiple circular magnetic fields located side by side, each of which surrounds a central core.

The two photos (images 4 and 5 in Figure 5.73 below) illustrate the shape of a PM's magnetic field (left) and the configuration of the magnetic field of a solenoid (right). Take note of the similarity.

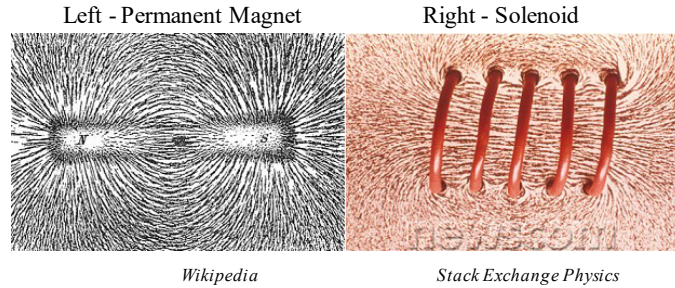


Figure 5.73 Permanent Magnet and Solenoid [Fair Use]

- *Image 4 (left) depicts the dipole (field) of a PM painted by iron filings.*
- *Image 5 (right) demonstrates the dipole (field) of a solenoid painted by iron filings.*

In summary, given the fact that the outer shell electron structures of an electromagnet, as well as a PM, are analogous, and the observation that the shape of the magnetic field of a permalloy and a solenoid both consist of concentric circles, side by side, each surrounding a central core, offers credence to the conclusion that the magnetic field of a PM is generated in the exact same manner as an EM. What is more, it is very difficult to explain just how the magnetic field of a PM can appear as illustrated in Image 1 (PM) by using only the classical, moreover, accepted electron dipole theory. To further delve into this magnetic field correspondence, now imagine a longitudinal cross section of a solenoid as portrayed in Figure 5.74.

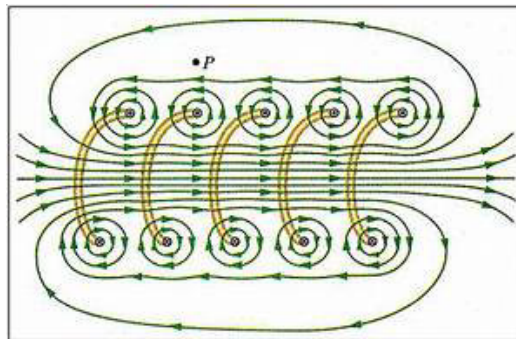
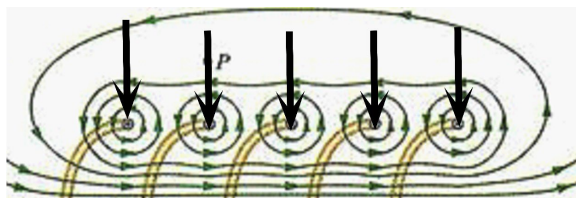


Figure 5.74 Magnetic Field of a Solenoid [Fair Use]

The image imparted above is the cross-sectional appearance of the magnetic field produced by a solenoid.

See figures 5.74 above and 5.75 below. Additionally, pertaining to a solenoid, picture in your mind a cross-section of the individual wires, with their currents, moreover, associated magnetic fields, as shown in the two images, figures 5.74 above and 5.75 below. If so, then one would envisage multiple circumferential shaped magnetic fields, located side by side, each surrounding a central wire or the core.

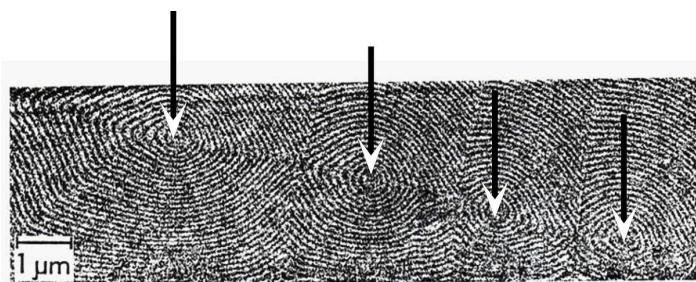


NDC Resource Center

Figure 5.75 Top Half of an Electromagnet [Fair Use]

Figure 5.75 is the top half of Figure 5.74. Notice the circular magnetic fields located side by side.

Refer to figures 5.76 and 5.77 below, furthermore, the following deliberations. It is important to note that these illustrations are not schematics, rather actual photos of magnetic fields. Figure 5.76 is that of a PM. Figure 5.77 is of a solenoid.



Quantum World by Akira Tonomura

Figure 5.76 Permanent Magnet [Fair Use]

See figures 5.76 above and 5.77 below. This is crucial. The adjacent circular field patterns surrounding a central core are analogous structures, although one is an electromagnet (Figure 5.77) and the other a PM (Figure 5.76) just like figures 5.70 and 5.75.

So overall, for all the above reasons, this alternate theory posits that each domain of a PM is formed from stacks of superconducting circular electron currents somewhat analogous to a solenoid.



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Figure 5.77 Electromagnet (Solenoid) [Fair Use]

Notice, for both a PM and an EM, there are multiple circular structures containing a central core, located side by side.

Even so, although these two types of magnets are similar, they are not identical. On one hand, with regard to a solenoid, there is only a single spiral wire. On the other hand, with reference to the domains of a PM, the individual circular currents are positioned one on top of the other, analogous to a stack of coins. In addition, in contrast to an EM, a PM's current is persistent, moreover, at room temperature. Therefore, it must be super-conducting, given the fact that there is no input of energy, moreover, no production of heat.

Furthermore, the magnetic field lines located within a PM are significantly entrained, as they must pass through multiple, extremely compact" solenoid-like"-shaped loop currents (domains), which are not only located on top of one another but also positioned closely side by side. For that reason, the magnetic field lines produced within the substance of a PM are not as dispersed compared to that of an EM. This is also because the latter does not trap the field lines as much, as its central core consists mainly of air. Consequently, the appearance of the field lines located within a PM are significantly more compact, or entrained, compared to the open central portion of a solenoid (EM).

Overall Conclusion for the Physics of a PM

See figures 5.78 and 5.79 below. The above discussions and illustrations establish that the production of the magnetic field of an electromagnet, the Earth's magnetic field, and the magnetic field of a PM, are all one and the same process. So, assuming that this postulate is correct, the classic dipole electron model for the production of the magnetic field of a PM can be discarded.

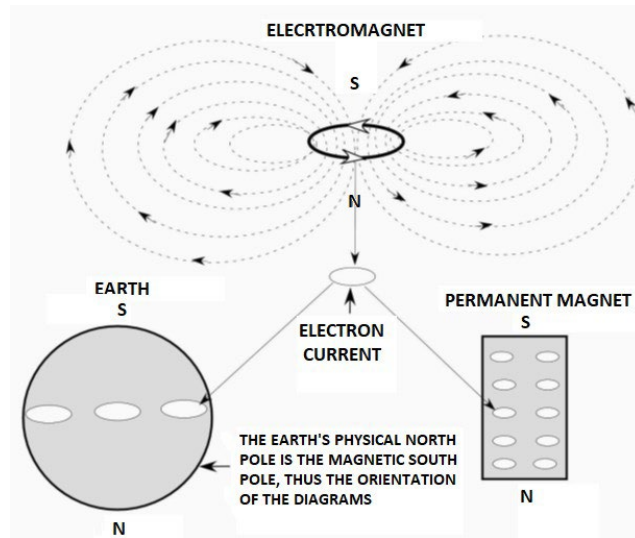


Figure 5.78 Comparing the Magnetic Field of the Earth, PM, and Electromagnet [Fair Use]

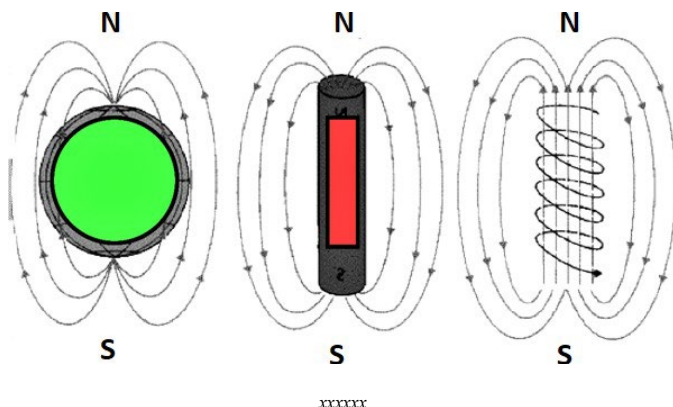
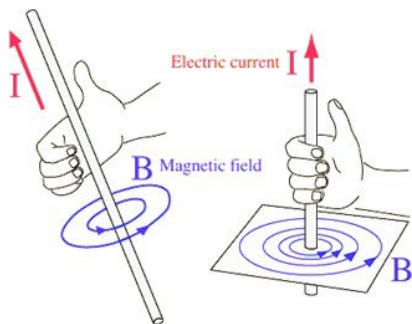


Figure 5.79 Comparing the Magnetic Field of the Earth, PM, and Electromagnet [Fair Use]

4. The Internal Lorentz Forces of Both a PM and an EM

(a) Internal Lorentz forces of a solitary EM

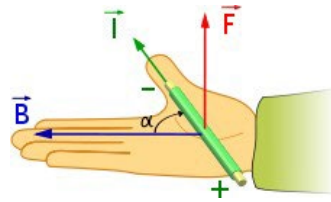
Up to this point, this chapter has fairly well established that the underlying principles of the physics of the PM and a solenoid are analogous. Even so, before one can comprehend these two new novel motors, there is still more to clarify. To accomplish this task, first the internal Lorentz forces of an EM will be examined, that being easier to visualize. And once that concept is understood, it can be extrapolated with reference to the function of a PM.



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Figure 5.80 Orientation of Magnetic Field [Fair Use]

Figure 5.80 above shows the orientation of a magnetic field produced by a positive current.

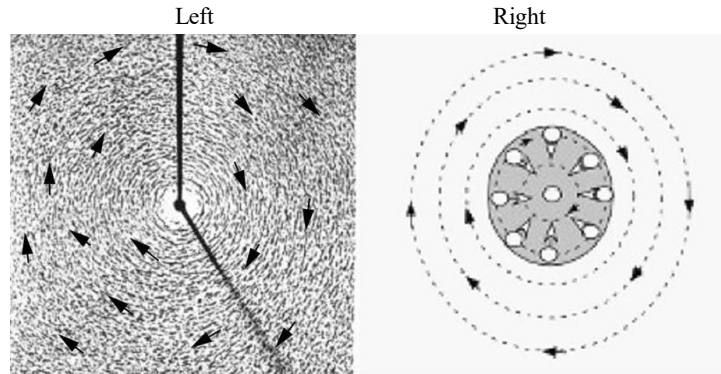


Wikimedia Commons

$B =$ magnetic field; $I =$ current; $F =$ force

Figure 5.81 Direction of the Lorentz Force [Fair Use]

• Figure 5.81 above depicts the orientation of Lorentz force produced by the interaction of a positive current with a magnetic field. Take note, the force is oriented at a right angle relative to both the current and magnetic field.



Wikimedia Commons

Figure 5.82 Hollow Arrows Depict Lorentz Force [Fair Use]

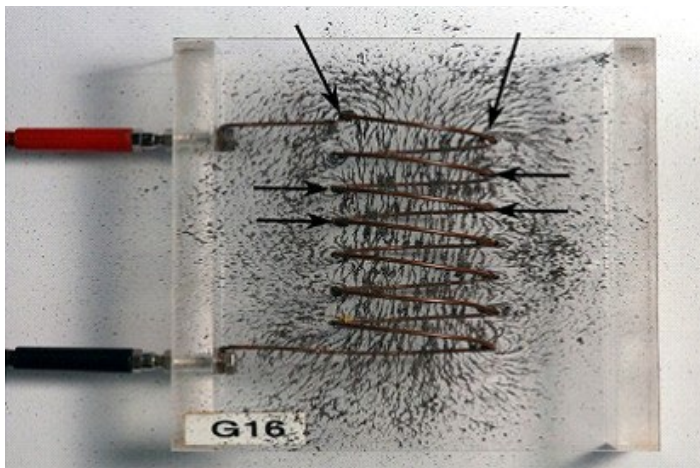
Figure 5.82 (left) is a photo of the magnetic field induced by a straight wire conductor with a current painted by iron filings (left). This is a function of Figure 5.80. Black arrows = direction of magnetic field. In Figure 5.82 (right), the magnetic field then interacts inside the wire with its own current to produce Lorentz forces as portrayed by the hollow arrows (right). This is a function of Figure 5.81.

- Central gray circle (right) = cross section of straight wire conductor.
- Circular dotted lines (right) = magnetic field both outside and inside conductor wire.
- Current is traveling in the longitudinal direction into the page.
- Hollow arrows = symmetrical internal-oriented Lorentz forces located within the conductor.

Refer to figures 5.80, 5.81, and 5.82, moreover, the following dissertations.

As already revealed, a single straight wire conductor produces a circular magnetic field, both inside and outside of the wire (Figure 5.82). That magnetic field then interacts with its own current, \rightarrow again within the wire \leftarrow , to produce Lorentz forces. Observe that these forces are equal, moreover, inwardly symmetrical relative to the axis of the conductor. In essence, there are propulsive forces present, but as a result of inward symmetry, there is no net force, thus no motion, propulsion, or work.

In the same manner, as regarding a solenoid, the exact same physical process transpires, yet much more difficult to visualize. Now, refer to Figure 5.83 below and the following explanation.



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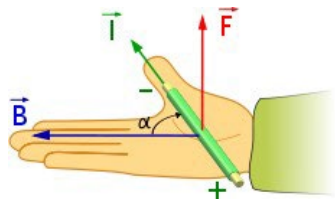
Figure 5.83 Solenoid with Magnetic Filings and Interaction Points of Current [Fair Use]

Figure 5.83 is a photo of a solenoid with its magnetic field lines painted by iron filings. The black arrows depict the locations where the current intersects with its own generated magnetic field lines, specifically at a right angle.

See Figure 5.83 above. Observe, vis-à-vis to the upper portion of the coil, the current intersects at a right angle with its own induced magnetic field (interaction location depicted by the slanted semi-vertical arrows). In addition, regarding the coil's central part, the intersection of the magnetic field lines and the current are again oriented at right angles (location depicted by the horizontal arrows).

These interactions then create Lorentz forces in the orientations as portrayed in figures 5.84, 5.85, and 5.86 below (hollow arrows).

But first recall:



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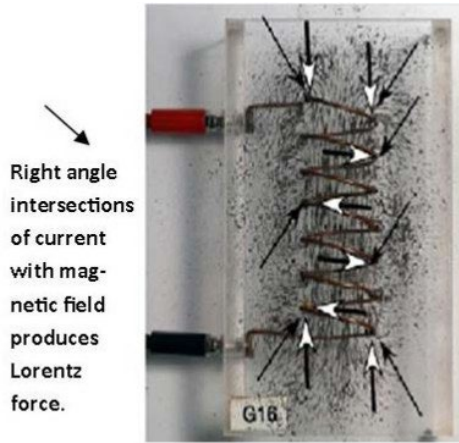
$B = \text{magnetic field}; I = \text{current}; F = \text{force}$

Figure 5.84 Orientation of Lorentz Force [Fair Use]

Orientation of Lorentz force with respect to the direction of the positive current as well as of the magnetic field.

Right-hand rule for a current-carrying wire in a magnetic field B .

See figures 5.85 and 5.86 below. The black arrows depict the intersection of the current and magnetic field lines oriented at right angles relative to one another. The white arrows represent the resultant Lorentz forces derived from those interactions.

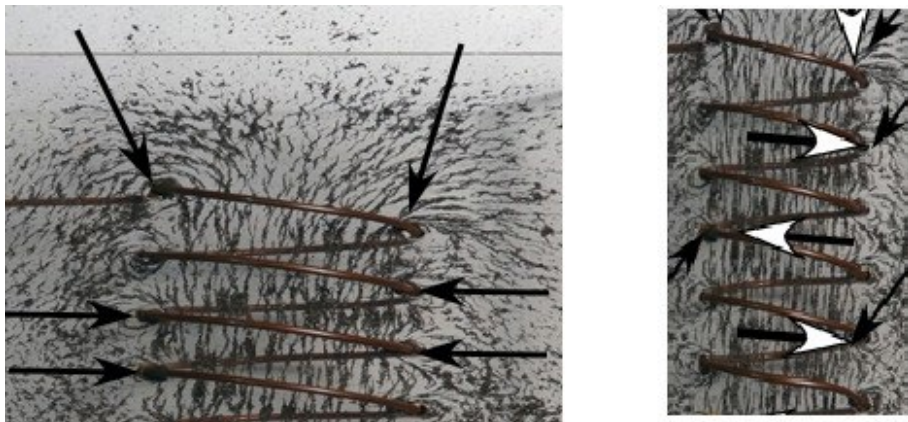


Right angle intersections of current with magnetic field produces Lorentz force.

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Figure 5.85 Solenoid with Magnetic Filings and Direction of Lorentz Force [Fair Use]

- The black arrows depict the locations of the interaction of the current with its own induced magnetic field, moreover, at right angles relative to each other. The white arrowheads represent the direction of the resultant Lorentz forces from those interactions.
- Note with reference to the overall solenoid, there is no $\rightarrow_{net}\leftarrow$ Lorentz force, because all the forces counteract one another or are blocked by the solenoid's physical structure. In essence, there are Lorentz forces present, but there is no $\rightarrow_{net}\leftarrow$ Lorentz force.



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Figure 5.86 Right-angle Interactions [Fair Use]

The image above is a distorted and magnified image, so the reader can easily visualize the right-angle interactions of the current with the magnetic field lines.

Observe that all the Lorentz forces either counteract one another or else are blocked by the solenoid's own intact physical structure. So, just as was demonstrated in the straight wire conductor example, even though there are Lorentz forces present, there is no net Lorentz force, thus no motion, propulsion, or work.

Below, in summary, are three separate groups of figures, 5.87, 5.88, and 5.89, portraying the analogous functions of an EM versus a PM. The following captions are self-explanatory.

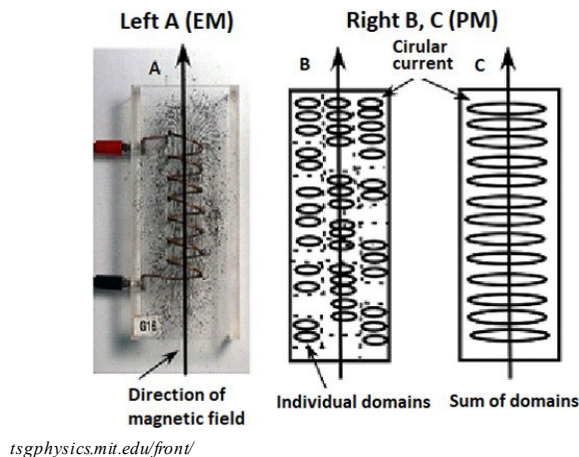
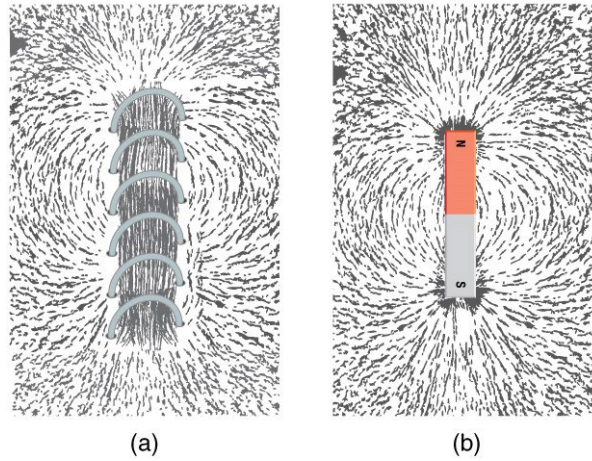


Figure 5.87 Electromagnet A, Permanent Magnet B and C [Fair Use]

- *A is an electromagnet; B and C depict a PM. The directions of the multiple circular currents are oriented as if directed from "out of the page" on the left side and "into the page" on the right side. The multiple circular currents then produce an overall internal magnetic field, which is directed towards the top of the page, represented by the upward-oriented large vertical straight arrow.*
- *(C) is the summation of all the individual domains of B. This illustration also shows that the function of an electromagnet and a permanent magnet are identical.*

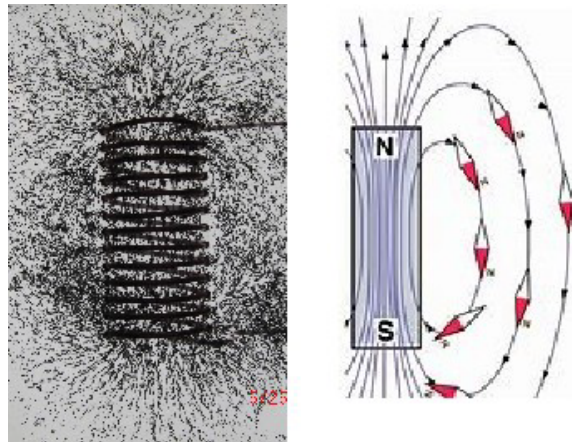
The following figures 5.88 and 5.89 establish that the external, as well as the internal, magnetic fields of both an EM and a PM are identical.



Wikipedia

Figure 5.88 External Magnetic Fields [Fair Use]

External magnetic fields are identical for both a PM and EM (figures 5.88 and 5.89).



University of Michigan

Hyperphysics

Figure 5.89 Internal Magnetic Fields [Fair Use]

Internal magnetic fields are identical for both a PM and EM (figures 5.88 and 5.89).

(b) Internal Lorentz Forces of Single PM

Up to this point, the main thrust of discussion has generally revolved around the EM. However, now the same physics will be extrapolated, moreover, shifted, so that the focus is now on a PM. This is because it already has been established that the physics of a PM and a solenoid (EM) are identical. The following illustrations present the extrapolation, as well as the correlation. Refer to Figure 5.90 below, and the following dissertation.

As depicted in Figure 5.90, a solitary PM (right), which is analogous to a solenoid EM (left), generates its own magnetic field lines. Subsequently, those lines interact with the circular domain currents located within the PM's own internal structure.

This interaction then generates Lorentz forces. Notice that they consist of opposing symmetrical forces, which counteract one another, or else forces that are blocked by the PM's own internal structure. Therefore, with respect to a solitary PM, indeed, Lorentz forces are produced, but there is no net Lorentz force. As such, there is no movement, work, or propulsion.

In other words, with regard to a standalone PM, relentless Lorentz forces are always generated/present, moreover, devoid of the classical input of energy; even so, there is no movement, thus no work ($W = F \times \text{distance}$).

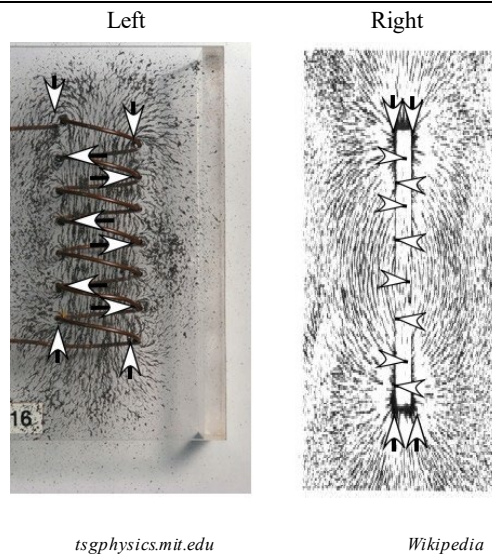


Figure 5.90 Electromagnet Left and Permanent Magnet Right [Fair Use]

- *The white arrows portray the internal Lorentz forces at different locations within both kinds of magnets. They are a product of the interaction of the currents with their own generated magnetic field lines.*

- *For both types of magnets, there is either opposing symmetry (vertical arrows) or alternatively, the Lorentz forces are blocked by the magnet's own internal physical structure (horizontal arrows). Therefore, with respect to a solitary EM/PM, even though Lorentz forces are present, there is no net propulsion or movement.*

- *Figure 5.90 to the right **partially** explains the reason why, when a PM is split physically longitudinally, along its own magnetic field axis, there is repulsion of the two halves away from one another.*

For the benefit of the nonphysicist, this concept will be re-explained from a slightly different angle. Pertaining to a solitary PM, as a function of perpetual superconducting circular electron domain currents, which then interact with their own induced magnetic field, Lorentz forces are constantly being generated, moreover, without an apparent input of energy. Nevertheless, given that these forces either are oriented anti-symmetrical or else are blocked by the PM's own physical structure, therefore balanced, there is then no movement or work ($W = f \times d$). In addition, these forces are assumed by most individuals, incorrectly, not to exist.

And so, the objective of these two novel types of motors is to capture these persistently generated Lorentz forces to do practical work, again without the input of classically defined energy.

As it will be clarified later on in this chapter, these types of motors cannot be explained by using the classical assumption, whereby the force generated by two interacting PM's is located in the region of the interacting fields outside the PM's own physical structure.

And second, it is inexplicable, presuming that there are no permanent intrinsic Lorentz forces constantly being generated by a standalone non-interacting PM devoid of energy input.

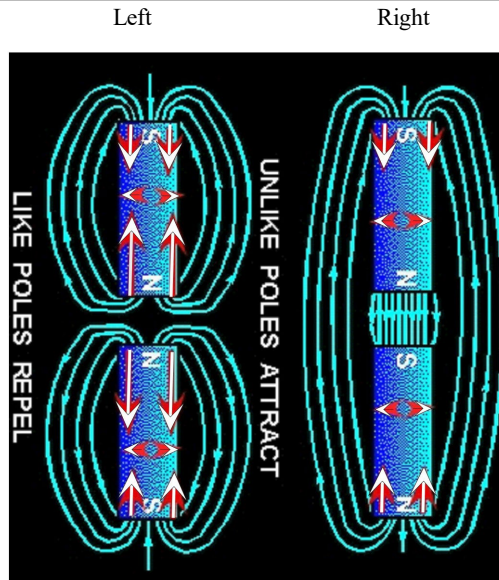
Alternately, the function of these new forms of motors can be understood, if one posits that a single non-interacting PM continually generates Lorentz forces. However, because they are either oriented anti-symmetrically or blocked forces, there is no movement or work. Fundamentally, these forces are always present but not apparent.

So, when given the proper configuration involving multiple PMs, these hidden forces can then be captured to produce useful work. This is the essence of the underlying physics of these types of motors.

5. Interacting PMs

Now, how about interacting PMs? Please refer to Figure 5.91 below and the following discussion. →See repulsion in Figure 5.91, left←. Presuppose there are two opposing PMs in the orientations as revealed. When compared to the magnetic field of a solitary non-interacting PM, the new unified field that forms, changes configuration. Essentially, relative to the physical flat ends of the inner north poles, the magnetic field lines then turn out to be oriented more horizontally/parallel. For that reason, compared to a single PM, the previous opposing, moreover, counteracting symmetry is then altered.

In this new setting, the interaction of the now more horizontal/parallel-oriented magnetic field lines, with their own domain currents of the two central north poles then changes alignment. For that reason, at these locations, there is an increase in the vertical-oriented Lorentz forces. This is not the case at the position of two south poles, because in those regions, there is no alteration of the field lines.



<http://www.uq.edu.au/SchoolScience/Lessons/29.1.1.4.GIF>

Figure 5.91 Drawing of Magnetic Fields for S/S and S/N Magnets [Fair Use]

The illustration above is not quite representative. In reality, regarding the repulsion schematic, rather than two separate fields, there should be only a single unified magnetic field. Regardless, the illustration is useful for comprehending the concept.

As demonstrated in Figure 5.91 (left) the vertical Lorentz forces located within the two central north poles are now greater compared to the opposite-oriented vertical Lorentz forces located within two outer

south poles. Therefore, the two PMs repel away from one another. Take notice: the small horizontal arrows (Lorentz forces) located inside each magnet are symmetrical and counteract one another.

→See attraction Figure 5.91 right←. Pertaining to the setting where there are two attracting PMs, moreover, when compared to the magnetic field of a solitary non-interacting PM, the new single unified field thus formed again changes configuration. Once more, the previously opposing, moreover, counter-acting symmetry with regard to a single PM is lost. So, vis-à-vis this second scenario, relative to the physical flat ends of the inner PMs, the magnetic field lines then turn out to be more vertically oriented. This effect then changes their interaction with their own domain currents located within the two inner poles. For that reason, at that location, there is then a decrease or absence of the vertical Lorentz forces. This is not so with regard to the outer poles for in those regions, there is no change in the orientation of the field lines.

Fundamentally, with reference to this second scenario, as demonstrated in Figure 5.91 (right), the vertical-oriented Lorentz forces located within the two central poles are then less than or absent compared to the opposite-oriented vertical Lorentz forces situated within two outer poles. Consequently, the PMs attract, or in reality, →propel towards one another←. Observe again, the small horizontal arrows (Lorentz forces) sited inside each magnet are symmetrical, moreover, negate one another.

Figure 5.92 below displays the same physics, but, rather than a schematic, these are actual images of the magnetic fields painted by iron filings. When viewing these photos, there are two important presuppositions to keep in mind. The first is that regarding the two interacting magnets, it is assumed that there is only one overall magnetic field, complex yes, but still only one field. The second is to observe the change in configuration of the magnetic field lines located between the two central interacting poles, as a function of attraction versus repulsion.

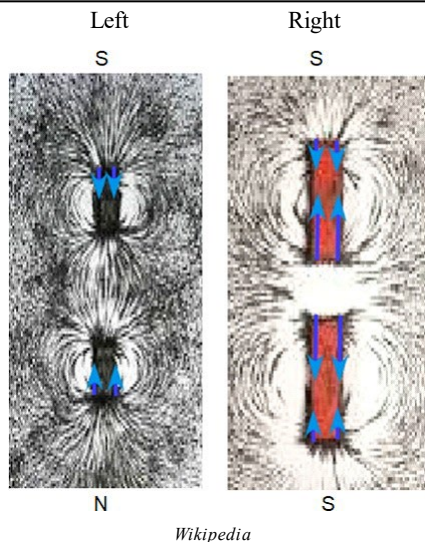


Figure 5.92 Magnetic Filings for S/N and S/S Magnets [Fair Use]

For each interaction, presume there is only one overall complex magnetic field. Now, with regard to repulsion versus attraction, observe the change in configuration of the magnetic field lines, vis-à-vis the two central interacting poles. In addition, note that the outer poles' magnetic field lines remain relatively unchanged.

Refer to Figure 5.92, right side (repulsion). When the two central north poles repel one another, regarding their two inner physical flat ends, then the induced magnetic field lines tend to become oriented more parallel or horizontal relative to those flat ends. This alteration produces an increase in the vertical repelling Lorentz forces. This transpires again because the more horizontal/parallel field lines then in-

crease their interaction with their own circular domain currents located within the two central north poles. In contrast, the two outer south poles' magnetic field lines remain unaffected, so, for those Lorentz forces, there is no change.

As a result, unlike the example of a single PM, whereby all of the Lorentz forces counteract one another or are blocked by the PM's own physical structure, therefore balanced, these two PM's possess unbalanced Lorentz forces. The vertically oriented Lorentz forces are now greater within the central north poles versus the opposite-oriented vertical Lorentz forces, which are located within the outer south poles. Therefore, the magnets repel one another until they are so far apart that they cease to interact. At that point, each of them functions as a single PM, again possessing balanced negating forces. Even so, relative to each other, they now possess momentum (velocity).

See Figure 5.92, left side (attraction). In contrast, when there are two central north and south poles, then relative to the two flat central ends, the magnetic field lines assume a more perpendicular or vertical orientation. This change in orientation produces, in that locality, a decrease in the vertical Lorentz forces. This occurs because the now more vertical field lines decrease their interaction with their own circular domain currents located within the two central inner poles. Again, the outer poles' field lines are unaffected; consequently, for those regions, the Lorentz forces remain unchanged.

As opposed to a solitary PM where all the Lorentz forces are balanced or blocked, these two PMs now possess unbalanced opposing vertical Lorentz forces, in this case, being greater within the outer poles as compared to within the inner poles. Therefore, in reality, the two magnets actually propel towards one another. Or as classically but incorrectly posited, they attract one another until they combine, thereby essentially transforming into one PM. This combined PM then functions as a single magnet, so at that time, associated with balanced as well as blocked forces.

With respect to a solitary PM, Lorentz forces are always being generated, furthermore, without apparent energy input. Forces are present, but there is no work/motion. In addition, whenever two PMs interact, moreover, move relative to one another, work is performed ($W = f \times \text{distance}$), nonetheless, not practical work. So again, the goal of these new forms of motors is to capture these perpetual/permanent forces, devoid of classic energy input, in order to perform \rightarrow useful work \leftarrow in the form of a motor. By using the alternative physics as just explained, new, novel motors are now presented as described below. There are two types of PM motors the author wishes to present.

- The permanent circular magnetic motor
- The shielded permanent magnetic motor

5.5.2 The Circular Permanent Magnetic Motor.

Assume a circle is assembled from attached, adjacent, rectangular, permanent bar magnets (PM's), as shown below in figures 5.93 and 5.94. The PMs are the rectangles that make up the periphery of the circle. The attached magnets are positioned on the outer surface of the plane of a wooden wheel.

In addition, presuppose there is a pivot located at its wheel's center, which allows it to freely rotate clockwise or counterclockwise. The pivot also prevents motion in any other direction.

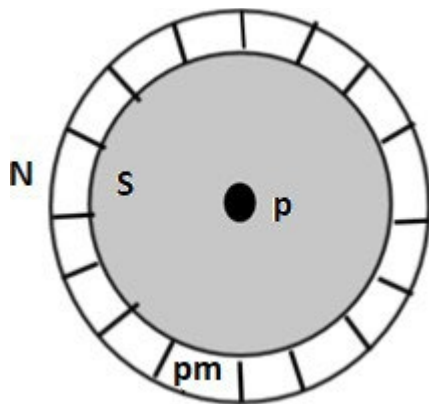


Figure 5.93 Wheel with Attached Magnets

The rectangles located peripherally on the outside of the wooden wheel represent attached PMs in the form of a circle.

Presume the north pole axes of all peripheral PMs are oriented towards the outside of the wheel, as shown below in Figure 5.94. The numerous hollow-tipped arrows of this figure represent the looped magnetic field, but only relative to the plane of all the attached circle of magnets. Additionally, the magnetic field direction is from south to north inside the PMs and from north to south on the outside of the PMs.

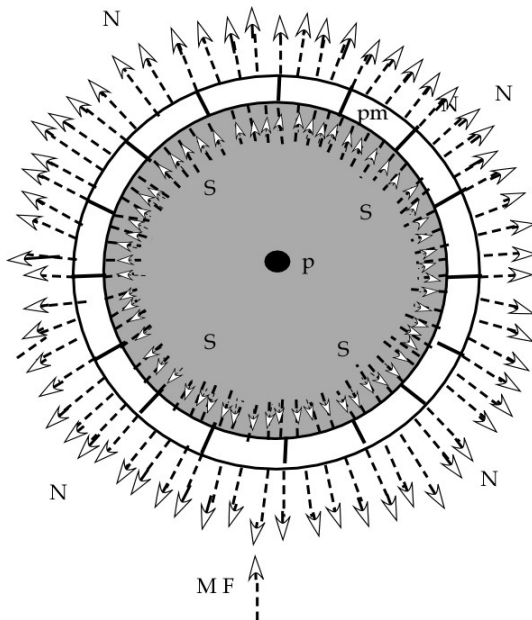


Figure 5.94 Looped Magnetic Fields

- *The rectangles located peripherally on the outside of the wooden wheel represent attached PMs in the form of a circle.*

- Dotted arrow = magnetic field.
- In reality, this is a looped magnetic field, but with respect to this illustration, only the plane of that magnetic field is shown.
 - The central black dot depicts the central axis/pivot of the wooden wheel.
 - The density of arrows corresponds to the strength of the magnetic flux, not their lengths.

Function

The circular currents located within the domains of the PMs generate the magnetic field. The magnetic field then interacts with those currents to produce Lorentz forces which are oriented as depicted below in Figure 5.95. Discern, the internal Lorentz forces that are attempting to split each individual PM are not shown.

Observe, as in Figure 5.95, the Lorentz forces counteract one another or are blocked by the PM's own internal composition, as well as from the overall intact physical structure of the circle of PMs. They are only balanced forces. As a result, even though Lorentz forces are persistently present, there is no net Lorentz force; therefore, there is no movement, work, or rotation.

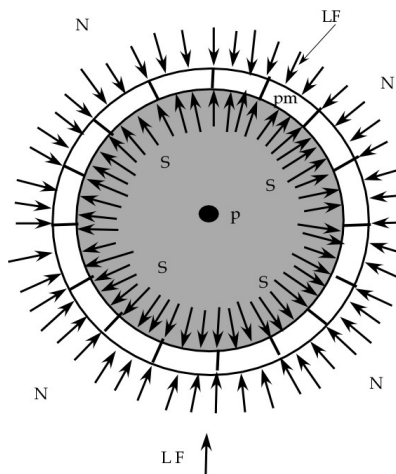


Figure 5.95 Opposing Forces Blocked by Physical Composition

- Solid arrow = Lorentz force.
- The Lorentz forces inside the circle are greater than outside the circle, but symmetry and the intact structure of the circle prevents motion.
 - The internal Lorentz forces attempting to split each individual PM are not shown in the illustration. This effect was explained earlier in this section.
 - Fundamentally, the Lorentz forces counteract one another or are blocked by the internal physical structure of the PMs, as well as from the overall intact physical structure of the ring of PMs.
 - Essentially, they are balanced forces, therefore, no movement or work.
 - The density of arrows corresponds to the strength of the Lorentz forces not their lengths.

Next, assume on both sides of the wheel, 180 degrees apart, that two bar-shaped PMs in an L configuration are compressed against the wheel as shown below in figures 5.96 and 5.97.

Observe how this function of compression by the two L-shaped PMs alters the configuration of the magnetic field of the assembled circle of peripheral PMs. In other words, as a result of the compression, there is an alternation in the configuration of the wheel's magnetic field.



Figure 5.96 L-shaped PMs

Two PMs are assembled in the form of an L.

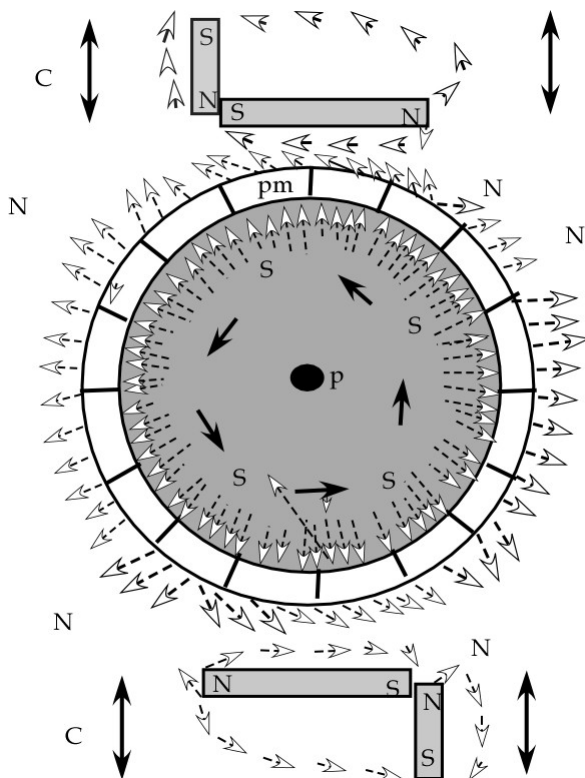


Figure 5.97 Magnetic Field of the Two L-shaped Magnets Compresses the Magnetic Field of the Wheel

As a function of compression by the two L-shaped PMs, the magnetic field of the wheel of attached PMs then changes its configuration as portrayed above.

As a result, as illustrated below in Figure 5.98 below, there is also a change in the direction of the wheel's resultant Lorentz forces (torques). Therefore, they are now not symmetrical or blocked forces; they are asymmetrical or unbalanced forces.

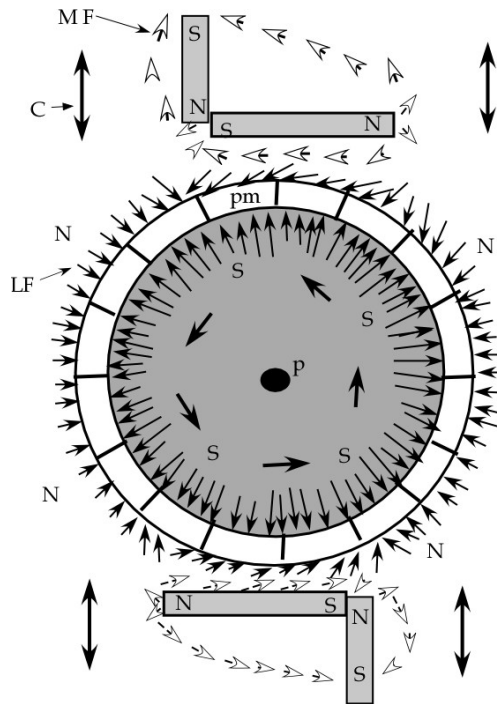


Figure 5.98 The Sum of the Lorentz Forces

The sum total of the vector Lorentz forces (torques) driving the wheel counterclockwise is greater than the sum total clockwise. Consequently, the wheel continues to rotate counterclockwise for the duration of the function of compression.

There are vector forces directed against the wheel's pivot from both sides, but the wheel is fixed at the pivot; therefore, those forces are counteracted/neutralized.

However, the sum total vector Lorentz forces derived from all the PMs (torques) driving the wheel counterclockwise is now greater than the sum total clockwise. So, for the duration of compression, the wheel continues to rotate counterclockwise, moreover, after the initial compression without apparent input of energy. Now, as a function of continuous compression, so long as the overall magnetic field is persistent in this form, then the wheel will continue to rotate devoid energy input. Essentially, since the unbalanced forces are persistent, so too is the rotation persistent, moreover, without energy input. Remember that a PM can last 20 years.

But, as usual, all is not that simple. Recall that a torque is a coupled force. This form of motor is geometry-dependent, as well as strength-of-gauss dependent. So in all cases, this novel motor works using two L-shaped magnets each of which is located on opposite sides of the wheel, furthermore, driving the wheel in the same direction (diameter torque). This is because by using the diameter torque, from two L-shaped PMs, there are always more Lorentz forces driving the wheel counterclockwise than clockwise. So the wheel then persistently rotates with continued static compression.

However, in other specific configurations, by using only one L-shaped magnet on one side (radial torque), it does not work in all scenarios. This is because, given certain configurations, by using only one L-shaped magnet with radial torque, the total sum of the torques driving the wheel counter-clockwise versus clockwise can be equal. Therefore, regarding that specific geometric scenario, there is then no rotation.

The quandary is this: Where does the energy ultimately originate in order to power the motor? By quick oversight, all of the above violates the law of conservation of energy. Nevertheless, assuming there is energy located in the vacuum of space (ether) as theorized, or perhaps, even proven by modern physics, then the author posits that this is the source of that energy. This vacuum energy maintains the circular domain's currents without obvious energy input.

If the reader does not believe that a PM can create energy without losing energy, then ponder this logic. Picture in your mind a solitary PM. Next, imagine attaching it to a large metal bolt; leave it there for a week and then separate them. During that time, the PM has not lost energy. In fact, a PM lasts longer if left attached to the bolt. However, the bolt is now magnetized.

Bear in mind, it required energy to rearrange the bolt's electrons in order to effect magnetization. In other words, the PM has not lost any energy. Even so, energy was utilized to rearrange the bolt's electrons to induce magnetism. So again, where does this energy originate? It comes from the energy of the vacuum of space, essentially another name for **the ether**.

5.5.3 The Shielded Permanent Magnetic Motor

By using the five basic attributes previously elucidated in the first part of this section, a limited explanation describes how to build an over unity-shielded PM motor.

But first, for review:

- Presupposing the classic laws of modern physics are correct, it is posited that a standalone PM produces no intrinsic forces/energy. In addition, the classic theory posits that when the magnetic fields of two PMs interact, outside their physical structures, it is at this locality where force occurs. However, in fact, persistent force occurs within the PM's own physical structure where the generated magnetic field interacts with its own current, without apparent energy input.

- Recall work = force x distance. However, this is not the same concept as force alone. So, when two PM's interact, forces are generated. Nevertheless, only if they are allowed to move relative to one another, then and only then, in that setting, work occurs. Otherwise, there exists only persistent force.

- Now, regarding two interacting PMs, moreover, as a function of repulsion or attraction, any motion induced is indeed work, although not practical work (e.g., motor). For instance, a hypothetical functioning motor assembled from two PMs, one acting as the rotor and the other fixed outside, has never been successfully built (see Figure 5.99 below). This is because the counteracting repulsion functions prevent the rotor magnet from completing a single circuit of over 360 degrees. Therefore, there is work but not practical work. Again, an example of this concept is shown below in Figure 5.99.

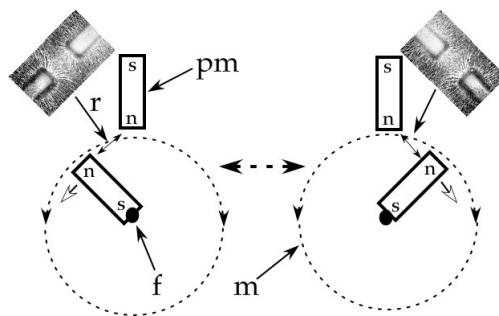


Figure 5.99 Practical Work is Not Possible; Magnetic Images Show Repulsion

Due to symmetrical mirror image repulsions, the rotor magnet (inside the circle) cannot complete a 360-degree circuit. Therefore, a true motor is not possible. Take note, there is motion (work), however, not practical motion.

- In addition, with reference to classic modern-day physics theory, aside from the repulsion or attraction of two PMs, it is posited that there is no practical intrinsic energy/force to capture in order to create such a device. Principally, this is the law of the conservation of energy.

- Alternately, presupposing that the alternate principles of physics, as portrayed earlier in this section, are valid, then a solitary PM is, in fact, associated with intrinsically perpetually generated Lorentz forces devoid of recognizable energy input.

Nevertheless, as a function of Lorentz force, anti-symmetry and the PM's own intact physical structure, no practical or useful motion or work transpires. Now, if the reader does not agree with this hypothesis, please pay close attention to the following three observations.

1. Whenever a solitary rectangular bar PM is split longitudinally, along its magnetic axis, the two halves then repel from one another. So, given this fact, consider this logic. Within the bar PM, there must be intrinsic longitudinal splitting persistent forces constantly being generated, nevertheless, blocked by its own intact internal structure. They are not perceived, until, as above, the PM is split longitudinally. This concept is more intricate since wherever the bar PM splits longitudinally, transforming into two separate magnets. Then immediately, the field lines rearrange, so that there is then classic repulsion relevant to two separate adjacent (side-by-side) bar PMs oriented with the same polarity. So, assuming that the author's hypothesis is factual, the initial, but not secondary, splitting function is real but not apparent.

2. In addition, if one holds two attracting PMs steadfast, even for years, thus preventing motion, a relentless force is continuously present, even without obvious input of energy.

3. As previously stated, if a PM is attached to a piece of steel/iron for a week and then separated, it magnetizes that object. Discern that the PM is unaffected; even so, it requires energy to produce the magnetization effect. This is an over unity concept.

And so, the goal of this motor is to utilize a novel magnetic shield, among other physical attributes, to capture the persistent intrinsically generated Lorentz forces of two repulsing PMs in order to produce useful work absent apparent energy input. The function of this device is a violation of the law of conservation of energy.

The alternative physics previously explained in the beginning of this section was very time-consuming, furthermore, complex, but necessary in order to appreciate how this over unity PM-shielded motor actually works, which is as follows.

In order to construct a motor of this kind, it is necessary to build a magnetic shield that neither attracts nor repels a solitary externally placed PM. In contrast, it must be capable of reducing/diverting a magnetic field, such that it decreases the Lorentz forces of two repelling PMs when placed on opposite sides of the plane of the shield.

This form of shield is constructed by utilizing numerous other small PMs as presented below. See figures 5.100, 5.101, and 5.102.

So now, here is the methodology of how to construct a shield of this type.

1. On one side of a 3mm-thick, 4-inch by 4-inch aluminum flat metal plate, 2mm x 1mm x 5mm permanent neodymium magnets with opposing poles relative to their widths are positioned side by side, as portrayed below. They attract each other in this position, so it is relatively easy to produce a single sheet. An entire square, 4-inch by 4-inch, is then assembled, as shown below.

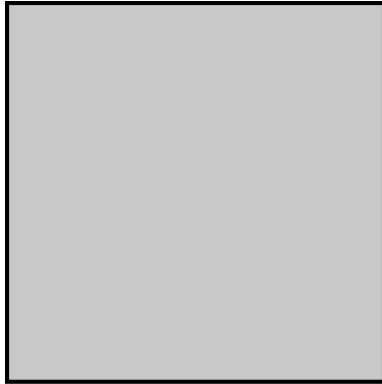


Figure 5.100 Flat Aluminum Plate

Figure 5.100 depicts a .5 cm-thick square plate (4" x 4") made of aluminum.

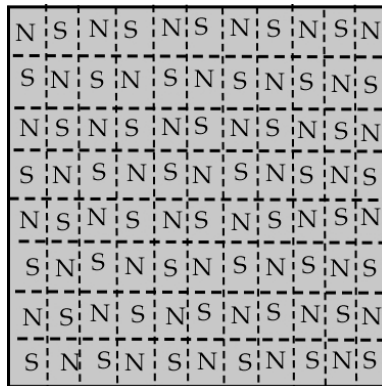


Figure 5.101 Front view

On one side of the plate, 2mm x 1mm x 5mm permanent neodymium magnets with opposing poles, relative to their widths, are arranged side by side.

2. Next, relative to the plane of the metal plate, successive symmetrical layers of similarly aligned PMs are laid down until the desired thickness is achieved, in this case, five layers.

Figure 5.102 is a photo of the actual shield, but in this case, on both sides of a single aluminum plate.



Figure 5.102 Photograph of Actual Shield

Given the fact that this type of shield is constructed from an equal number of opposite-oriented magnetic poles, there is no overall effect exerted on a single externally placed PM. This is a non-attracting/non-repulsion magnetic shield. For future reference, this form of shield will be labeled as (NANRMS). Additionally, with respect to this section, unless otherwise specified, the term shield and NANRMS are assumed to be synonymous.

The above effect only occurs if the external PM is at least a half-inch away from the shield. When closer, there is a slight attraction. Furthermore, when extremely close, it totally reverses the direction of some domain currents located within the shield's many PMs. As a result, it attaches itself to the shield.

This type of shield (NANRMS) functions several ways. First, even though it does not attract or repulse a solitary externally placed PM, it does result in reduction of repulsion between two PMs of the same polarity when on either side of the shield. One can test this effect by observing the amount of repulsion, with the shield present, and then without the shield.

Recall, outside a PM, the magnetic field travels from south to north, and within its substance, north to south. Furthermore, recollect that an electric field's strength decreases, as a function of the inverse square of the distance, theoretically to infinity. In contrast, this is not the case with respect to the magnetic field of a PM. Essentially, a magnetic field curves back upon itself, outside its own physical structure from south to north and travels inside from north to south. So, the field generally decreases as a function of inverse third power (or more) of the distance, although this also depends upon its physical shape.

So just how does the NANRMS actually work? As a possibility and only an option, the shield could, regarding a single external PM sited relative to one of its sides, divert a portion of its circular magnetic field back upon itself before it travels through the shield.

→This diversion occurs because the shield spreads out a portion of the external penetrating magnetic field, within its own internal substance, whereby it then returns to the external PM opposite pole, thus reducing its overall penetration through the shield←.

In addition, relative to the shield's other side, this spreading-out function also spreads out the remaining field lines as they exit the shield. So, assuming there is an opposing PM placed on the other side of the shield, with a more localized or concentrated field, then compared to if there was no shield, there is then less interaction between the two opposing PMs. Furthermore, in the scenario where there are two opposing polarities, sited on opposite sides of the shield, then as just described, moreover, with respect to

both sides, exactly the same processes occurs. In effect, the shield symmetrically (functionality) reduces the forces of repulsion of those two PMs when positioned on opposite side of the NANRMS (e.g., two repulsing north poles).

Third, regarding a solitary external PM placed on one side of the NANRMS and with respect to its other side (NANRMS), the shield alters the direction of the remaining penetrating field lines as they exit the shield on that side. Essentially, on the other side, as the remaining field lines exit, relative to the plane of the shield, their orientations tend towards perpendicular, as well as increasingly angled inwards towards the axis of the originator PM.

Again, for the benefit of novice, →regarding two repulsing poles located on either side of the NANRMS←, what really transpires with respect to this form of shield is this.

- The NANRMS returns a portion of the magnetic field generated by each external PM back upon itself, moreover, within the shield; thus, for that fraction, it completes the circuit without traversing through the shield. This symmetrical effect occurs with respect to both sides. This function reduces the repulsion of two opposing PMs when placed on opposite sides of the NANRMS.

- In addition, as for those remaining magnetic field lines which successfully travel through and exit the NANRMS, they become more spread out. So, for any interface with a more concentrated magnetic area located on the other side, there is then less interaction. This function also results in a reduction in force of the two repelling magnets. Again, this symmetrical effect occurs with respect to both sides.

- The NANRMS also changes the direction of the remaining field lines, as they successfully travel through and exit the shield. Therefore, relative to both sides, this alteration changes the interaction with the opposing magnetic field lines with their own domain currents.

- Furthermore, there is another factor to consider. This is related to the orientation of the Lorentz forces that are directed at the rotor's pivot. This subject will be clarified later in this chapter.

The author has actually built a shield of this type, so it does work as advertised. This is the result of years of experimenting with PMs. However, this hypothesized motor is very complex, moreover, with so many different interacting magnetic fields and functions, the author does not really comprehend how it would actually work. The author posits the basic theory but does not fully comprehend the details.

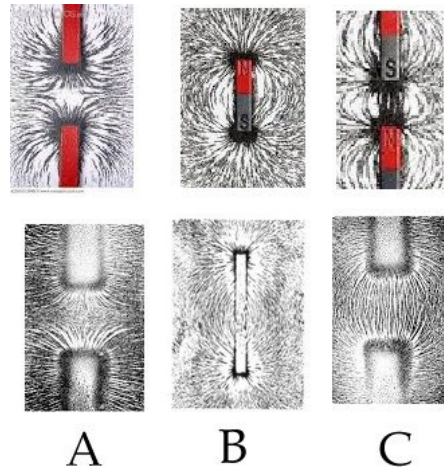
Therefore, to simplify some core functions, the following principles are presented, even though these descriptions do not characterize the overall physics applicable for the construction of such a device. In reality, the hypothesized motor is much more complicated, since there are multiple types of shields, moreover, the inner rotor/armature magnet is not a single linear-bar PM, rather extremely complex.

In summary, the following principles explain only some of the physics involved. Even so, they are not adequate enough to successfully build a motor of this type. In other words, the author cannot completely explain its intricate functions. For that reason, it ultimately may be necessary to build a number of them, give them away, and then let others clarify the physics involved. In order to simplify the motor's inner workings, first six basic principles are presented with illustrations followed by descriptions and explanations. Subsequently, these principles will be used to give explanation to some, although not all, of this motor's functions.

Principle 1.

See Figure 5.103. Principle 1 is a review of previous deliberations. Observe the shape of the central interacting magnetic field lines of (A) compared to (B). In this case, relative to the two central flat physical poles, the field lines become more transverse, parallel, or horizontal. Therefore, there is repulsion. In addition, note the shape of the central magnetic field lines of (C) compared to (B). In this second setting, relative to the two central flat poles, the magnetic field lines then become more perpendicular or vertical. Consequently, there is attraction.

(Repulsion) With reference to the two central north poles, the alterations of the magnetic field lines produce a change in the magnitude of the vertical Lorentz forces. This is because when A is compared to B, the rearranged magnetic field lines then change their interaction with their own domain currents within the two central north poles. Essentially, the field lines become more horizontally parallel relative to the physical flat ends of the two central poles. As a result, there is an increase in the vertical Lorentz forces, as compared to the opposite-oriented vertical Lorentz located within the two outer south poles whereby there is no change. Therefore, the two PMs repel away from one another.



Wikipedia

Figure 5.103 Comparing Magnetic Fields [Fair Use]

Figure 5.103 depicts the magnetic field of:

- *A = repulsion forces of two PMs*
- *B = balanced forces of one PM*
- *C = attraction forces of two PMs*

(Attraction) Now, regarding (C) versus (B), the magnetic field lines become oriented more towards perpendicular relative to the physical flat ends of the two central poles. Consequently, within the domain currents of the central poles (N, S), there is then a decrease in the vertical Lorentz forces compared to the opposite-oriented vertical Lorentz forces sited within the two outer poles (S, N) whereby there is no change. As such, in reality, the two PMs propel towards one another. Nevertheless, we perceive this function en erratum as the two PMs attracting one another. In reality, it is a propulsion force not an attraction force. Once again, bear in mind, relative to both repulsion and attraction (Figure 5.103), the internal horizontal Lorentz forces attempting to split each separate magnet apart longitudinally (not shown) are symmetrical and counteract one another.

Principle 2.

Figure 5.104 represents the motor's physical structure but devoid of a shield. As such, without a shield, it is nonfunctioning. Even so, it does depict the motor's basic structure.

In reviewing Figure 5.104 below, you'll see that the inner bar (PM) is the rotor, which is attached at a fulcrum/pivot. Its north pole polarity is as shown. The outer fixed PM, including its north pole polarity, is also pictured.

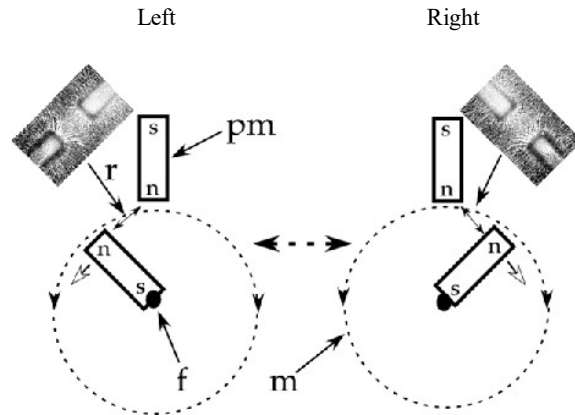


Figure 5.104 Motor with No Shield; Magnetic Images Show Repulsion

- *pm = permanent magnet*
- *f = fulcrum*
- *Photos are of repulsion*
- *m (dotted circle) = motor*
- *n, s = north and south poles*
- *r = repulsion*

Therefore, as illustrated, if one positions the rotor's north pole in either of the two-mirror image positions, then with respect to these orientations, the opposing north poles symmetrically repel one another. Consequently, on the right, the repulsion produces clockwise rotation. Alternatively, on the left, there is counterclockwise rotation.

So as depicted in Figure 5.104, because of the counteracting repulsions, the rotor magnet cannot complete a full 360-degree circuit. For that reason, a functioning motor cannot be built.

Principle 3.

Now, presume a flat plate-like magnetic shield consisting of iron/steel (sms) is positioned halfway between the longitudinal axes of the outer fixed PM as shown below in Figure 5.105. Note, this is not a NANRMS. It only functions as a classic magnetic shield. Therefore, it attracts both opposing north poles. For that reason, a motor is not possible, since again the rotor PM cannot complete a full 360-degree circuit.

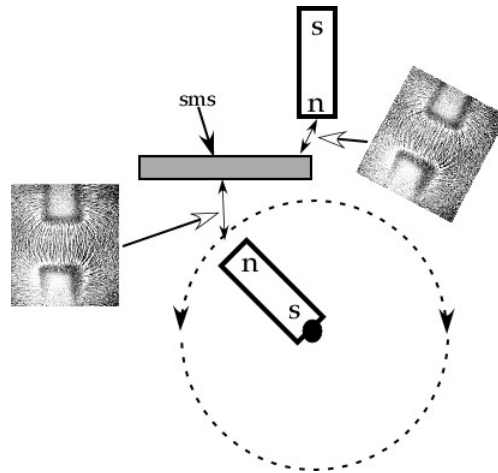


Figure 5.105 Motor with Shield; Magnetic Images Show Attraction

- *sms = classic steel or iron magnetic shield.*
- *Figure 5.105 portrays a classic shield made of iron/steel (sms). This kind of shield attracts both opposing north poles. As a result, the rotor magnet cannot continuously rotate in one direction.*

Principle 4.

Please refer to Figure 5.106 below, furthermore, the pre and post discussions. Figure 5.106 portrays two separate scenarios. The first, or upper schematic, demonstrates the configuration of the magnetic field of two repelling north poles, absent a shield.

The second, or lower schematic, depicts the same PMs, moreover, in the same orientations. However, in this setting, both opposing PMs are in the presence of this intervening new form of shield (NANRMS). Observe, regarding the two central interacting north poles, just how this shield changes the magnitude, as well as orientations of the remaining field lines as they traverse and exit the shield on each side. Essentially, they are reduced, moreover, with a change in direction.

Recall, the NANRMS functions as described without individually attracting or repelling either external PM. Basically, under the influence of the shield, the two opposing poles interact with reduced repulsion. Nevertheless, the shield, in and of itself, does not separately affect either external PM.

To recap, the NANRMS reduces the magnitude, moreover, rearranges the orientation of the remaining exiting field lines vis-à-vis two opposing externally placed PMs, with their north poles, sited on either side of the shield. This effect then alters the orientation and the strength of the repelling horizontal (specific to this schematic) Lorentz forces. In essence, relative to the two repelling central north poles, then under the influence of the NANRMS, there is a reduction of those repelling Lorentz forces.

See Figure 5.106. Again, as portrayed below, the NANRMS reduces, as well as diverts, the two opposing north magnetic field lines as they exit the shield on both sides. Therefore, this dual effect produces a change in orientation thus interaction of the magnetic field lines with their own domain currents located within both north poles. As such, there is then a reduction in the horizontal Lorentz forces, (specific to this schematic) as compared to the scenario without a shield.

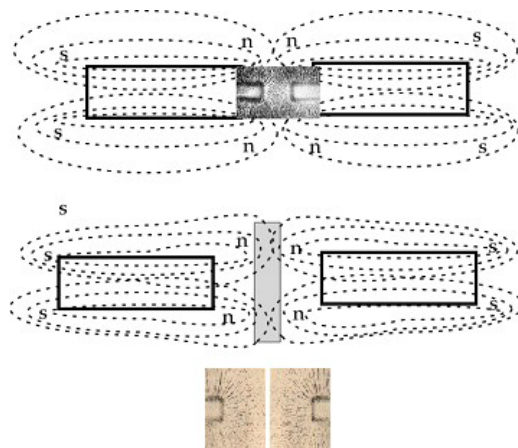


Figure 5.106 Upper Magnet with No Shield; Lower Magnet with a Shield

The upper schematic shows the repulsion of two north poles without a shield. The lower schematic portrays the same PMs but now in the presence of an intervening non-attracting/non-repulsion magnetic shield (NANRMS). Observe, the NANRMS reduces the number of interacting north field lines, moreover, rearranges the orientation of the then remaining fields lines.

In other words, lower schematic compared to the upper schematic.

- The number of interacting field lines relative to both magnets are diminished.
- Relative the PMs physical flat ends, the remaining penetrating field lines become oriented more towards perpendicular.

This dual alteration has the effect of reducing the repulsion of, in this illustration, the horizontal Lorentz forces (the two repulsing north poles). So, in the upper schematic, there is repulsion, whereas in the lower one, there is reduced repulsion.

Principle 5.

Refer to figures 5.107 and 5.108, in addition the pre and post deliberations. Figure 5.107 is a replication of Figure 5.104. Observe there is no shield. With reference to figures 5.104 and 5.107, recall the repulsion of the north poles clockwise is mirror image symmetrical to the repulsion counterclockwise. For that reason, the rotor magnet cannot complete a circle, so it cannot function as a motor.

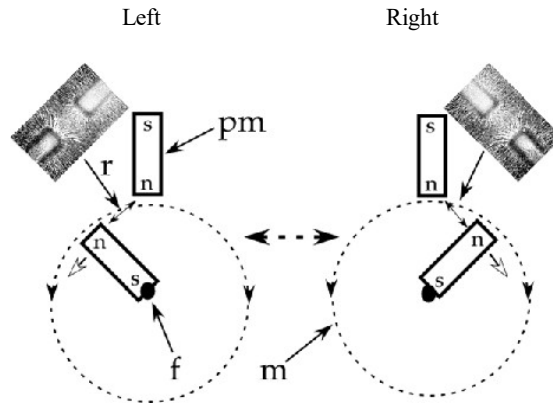


Figure 5.107 Motor Without a Shield; Magnetic Images Show Repulsion

Without a shield, the repulsion of the two north poles clockwise is a mirror image equal to the repulsion counterclockwise. Therefore, the rotor cannot complete a full circuit; thus, it cannot function as a motor.

Alternately, concerning Figure 5.108 below, due to the presence of a NAMRMS while under its influence, there is a diminution of repulsion. So, regarding this scenario, the repulsion clockwise is greater compared to counterclockwise. If the difference is great enough, the rotor magnet then can complete a full circuit, moreover, repeat the sequence. This, in principle, is a motor.

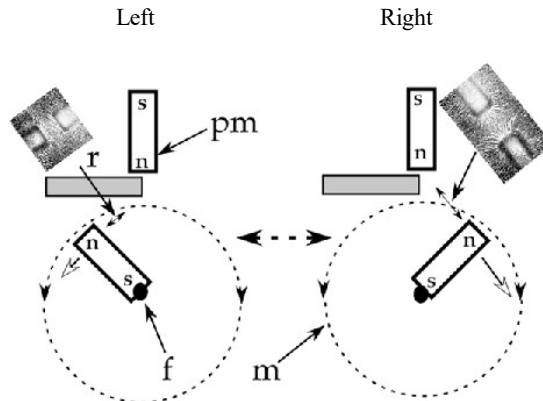


Figure 5.108 Motor with Shield; Magnetic Images Show Repulsion

Assuming the positioning of non-attracting/repulsion shield (NAMRMS) is as portrayed above, then the repulsion clockwise is greater compared to counterclockwise. The lengths of hollow arrows denote the magnitude of the amount of repulsion.

The clockwise arrow is longer in length than the counterclockwise arrow; therefore, if the difference is great enough, the inner rotor magnet can then complete the circuit, moreover, repeat the sequence, thereby functioning as a motor.

Principle 6.

As previously indicated, there is another factor to consider, and it is this. Regarding the opposing PMs, not only does the novel NANRMS reduce the Lorentz forces between the two sides (opposing north external poles), but it also changes the direction of repulsion.

Under the influence of the NANRMS relative to the shield's flat surface, specifically located on the side towards the rotor, the Lorentz forces exerted on the rotor magnet are then oriented in line to its longitudinal axis.

This change in direction has the effect of repelling the rotor magnet directly against its own pivot. However, since the pivot is fixed, there is no movement.

To recap, as the rotor magnet approaches the outer fixed magnet, from the clockwise direction, then as a function of the NANRMS, not only is there reduced repulsion, but a larger portion of the remaining repulsion is now directed towards the rotor's own pivot. This is not the case once the rotor magnet passes the NANRMS, whereby full repulsion resumes, moreover, then not directed primarily against the pivot. This process is depicted as shown in Figure 5.109 below.

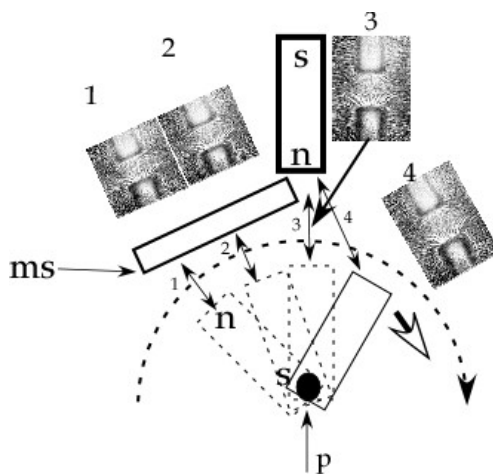


Figure 5.109 Summary of Motor with Shield; Magnetic Images Show Repulsion

The NANRMS also changes the direction of the Lorentz forces. Therefore, when the rotor magnet approaches the outer fixed magnet from the clockwise direction, the repulsion is then mainly directed along the rotor magnet's own longitudinal axis, thus directly against its pivot, which, in turn, prevents motion.

However, once the inner rotor magnet passes the outer fixed magnet/shield, the vector of repulsion is then oriented primarily in the clockwise direction.

In summary, combining all six of the principles just presented, as well as prior explanations into one overall concept, here is the physical/functional description of this novel motor. Unlike iron or some forms of steel, the NANRMS does not generate an overall attraction/repulsion to other individual external PMs. This is because it is constructed from an equal number of very small PMs oriented so that, overall, the many fields negate one another.

In addition, as portrayed in all the above illustrations, during rotation when the rotor magnet approaches the external PM from the clockwise direction, there is an intervening NANRMS. As such, while under its influence, it undergoes a reduction in repulsive Lorentz forces. In addition, a larger segment of the remaining repulsion is directed against the rotor's own fulcrum/pivot, therefore, for that fraction, preventing motion.

However, the NANRMS ends halfway through the longitudinal axis of the outer PM. Consequently, at this juncture, the full repulsive forces resume. Furthermore, the repulsion is then not directed mainly to-

wards the fulcrum, rather, now clockwise in the direction of rotation. So overall, presuming the difference between clockwise vs. counterclockwise repulsion is great enough, this device is essentially a motor.

Conclusion

PMs possess persistent Lorentz forces devoid of obvious energy input as imparted earlier in this chapter. Again, two repulsing PM's can perform work, nevertheless, not practice work. In contrast, regarding this motor, if repulsion is greater clockwise than counterclockwise as a function of the shield, then because of the motor's rotation, there are always a set of PMs in the position of being repulsed clockwise. So, in this case, repulsion is now practical in the form of a motor. Again, energy and work can be extracted due to the fact that PMs poses persistent Lorentz forces without apparent energy input. This is the source of the over unity.

Essentially, just like the circular PM magnetic motor described in the prior section, these same persistent Lorentz forces are now captured to perform useful work (a motor) vis-à-vis the shielded PM motor.

5.6 Gyroscopes as a Function of PFGRT

The framework of this subdivision is as follows:

- 5.6.1 Introduction
- 5.6.2 First Description
- 5.6.3 Second Description
- 5.6.4 Third Description
- 5.6.5 The Author's Description of the Function of a Gyroscope
- 5.6.6 The Authors of Two Experiments Relevant to Gyroscopes and Loss of Inertial Mass
- 5.6.7 Author's Postulate Regarding the Loss of Inertial Mass
- 5.6.8 Different Kinds of Experiments Versus the Loss of Inertial Mass
- 5.6.9 Precession Versus Forced Precession
- 5.6.10 Supporting Evidence for this New Theory/Postulate/Hypothesis
- 5.6.11 Another Hypothesis Regarding Gyroscopes and Inertial Mass
- 5.6.12 Gyroscopes as a Partial Function of Force
- 5.6.13 Further Discussion Regarding Inertial Mass
- 5.6.14 Propulsion Using Gyroscopes
- 5.6.15 Propulsion with Magnetic Fields

5.6.1 Introduction

In 1974, Laithwaite was invited by the Royal Institution to give a talk on a subject of his own choosing. He decided to lecture about gyroscopes, a subject in which he had only recently become interested. His interest had been aroused by an amateur inventor named Alex Jones, who contacted Laithwaite about a reactionless propulsion drive he (Jones) had invented. After seeing a demonstration of Jones's small prototype (a small wagon with a swinging pendulum which advanced intermittently along a table top), Laithwaite became convinced that "he had seen something impossible." In his lecture before the Royal Institution, he claimed that gyroscopes weigh less when spinning and, to demonstrate this, he showed that he could lift a spinning gyroscope mounted on the end of a rod easily with one hand but could not do so when the gyroscope was not spinning as pictured below.

At this time, Laithwaite suggested that Newton's laws of motion could not account for the behavior of gyroscopes, and that they could be used as a means of reactionless propulsion.

The members of the Royal Institution rejected his ideas, and his lecture was not published. (This was the first and only time an invited lecture to the Royal Institution had not been published.) They were subsequently published independently as "Engineer Through the Looking-Glass." <http://www.peswiki.com> and Wikipedia



Wikipedia



Imperial College, London

Figure 5.110 Laithwaite with Gyroscope

If one watches the YouTube presentations by Eric Laithwaite, it is obvious that modern-day science lacks a complete understanding of how gyroscopes actually function. Without a doubt, these videos demonstrate that when a gyroscope precesses, it loses some of its inertial mass (weight). Moreover, when there is forced precession, there is then a lifting force. The apparent loss of inertial mass is pictured in the above photograph whereby Laithwaite lifts a heavy gyroscope while it precesses seemingly without effort. See Figure 5.110. See these YouTube sites:

<https://www.youtube.com/watch?v=MHLAJ7vySC8>

<https://www.youtube.com/watch?v=OpCEJxO6V9g> at 44 min. 40 sec.

<https://www.youtube.com/watch?v=NNLk5G3hgRg> at 4 min. 45 sec.

For further clarification, please refer to other YouTube videos as itemized below.

<https://www.youtube.com/watch?v=OpCEJxO6V9g>

<http://www.youtube.com/watch?v=MHLAJ7vySC8>

<http://www.youtube.com/watch?v=1eQp4grGdqY>

<http://projectavalon.net/forum4/showthread.php?>

Even so, Laithwaite's observations and findings have been totally ignored, moreover, rejected by the vast majority of modern-day physicists. What is more, he has been ridiculed, as in the time of Copernicus and Galileo. See this YouTube site:

<http://www.rense.com/general42/genius.htm>

There is a saying, "If one cannot learn from history, then one is condemned to repeat it." But the fact is the only thing we really learn from history is that we do not know the real history or learn from history; therefore, we repeat it (Voltaire). In essence, even in modern times, obvious scientific truths are often still repressed.

Later on in this section, several experiments are presented that confirm Laithwaite's hypothesis. But first, three classical descriptions of the fundamental physics of gyroscopes are presented. The first two were downloaded from the Internet, while the third is the author's own. Each is successively easier to comprehend. They are conveyed in this specific manner to demonstrate that even though modern-day physics can mathematically describe the function of a gyroscope, it is only when illustrated simply in three dimensions, that the average individual can then grasp the actual physical principles of a gyroscope. Then and only then, will one be able to comprehend by what means, while undergoing precession, a gyroscope loses inertial mass (weight).

Regarding the first two presentations, and especially for non-scientific individuals, most likely, they will not be able to make the connection vis-à-vis reduced inertial mass. In contrast, with the third de-

scription, the inter-relationship becomes clear to all. Additionally, only after comprehending the author's third description, will the following supporting experiments then make sense.

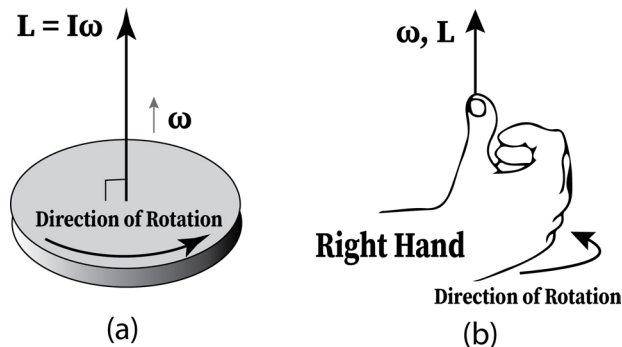
5.6.2 First Description

The following quotes and figures are all from the website Gyroscopic Effects: Vector Aspects of Angular Momentum:

<https://www.inkling.com/read/college-physics-openstax-college-1st/chapter-10/10-7-gyroscopic-effects-vector>

"Angular momentum is a vector and, therefore, has direction as well as magnitude. Torque affects both the direction and the magnitude of angular momentum. What is the direction of the angular momentum of a rotating object like the disk in figures 5.115 and 5.116?

"The figure shows the right-hand rule used to find the direction of both angular momentum and angular velocity. Both L and ω are vectors; each has direction and magnitude. Both can be represented by arrows. The right-hand rule defines both to be perpendicular to the plane of rotation in the direction shown. Because angular momentum is related to angular velocity by $L = I\omega$, the direction of L is the same as the direction of ω . Notice in the figure that both point along the axis of rotation."



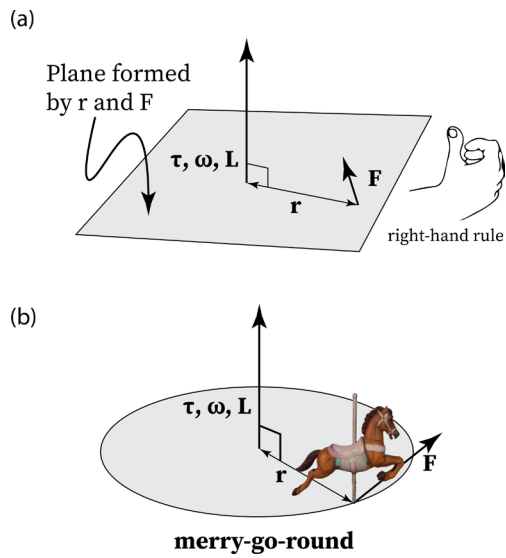
Credit: David de Hilster

Figure 5.111 Direction of both Angular Momentum and Angular Velocity

Figure 5.111 (a) shows a disk that is rotating counterclockwise when viewed from above. Now, recall that torque changes angular momentum as expressed by:

$$\text{NCT } \tau = \frac{\Delta L}{\Delta t}$$

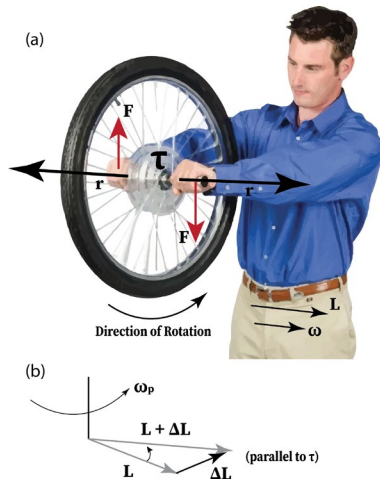
This equation means that the direction of ΔL is the same as the direction of the torque τ that creates it. This result is illustrated in Figure 5.111, which shows the direction of torque and the angular momentum it creates.



Credit: David de Hilster

Figure 5.112 Torque is Perpendicular to the Plane Formed by r and F

In the figures above, the torque is perpendicular to the plane formed by r and F and is the direction to your right.



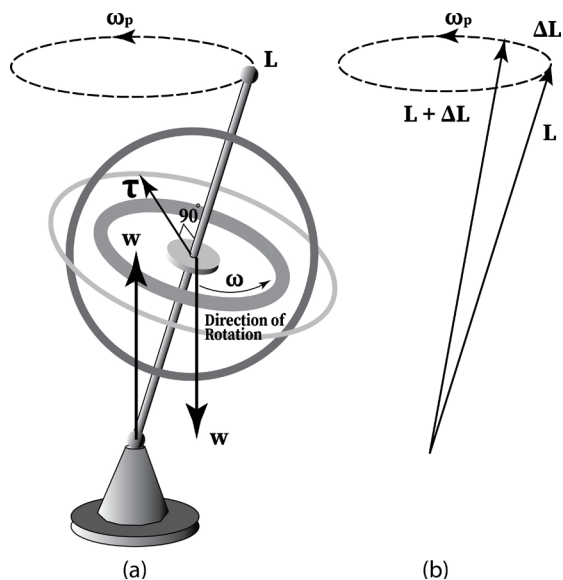
Credit: David de Hilster

Figure 5.113 Changing the Direction of L

Let us now consider a bicycle wheel with a couple of handles attached to it, as shown in Figure 5.113 above.

“This torque creates a change in angular momentum L in the same direction, perpendicular to the original angular momentum L , thus changing the direction of L but not the magnitude of L . Figure 5.113 shows how ΔL and L add, giving a new angular momentum with direction that is inclined more toward the person than before. The axis of the wheel has thus moved perpendicular to the forces exerted on it, instead of in the expected direction.”

The Gyroscopic Effects: Vector Aspects of Angular Momentum website goes on: (This device is popular in demonstrations among physicists, because it does unexpected things.) With the wheel rotating as shown, its angular momentum is to the man’s left. Suppose the person holding the wheel tries to rotate it as in the figure. His natural expectation is that the wheel will rotate in the direction he pushes it—but what happens is quite different. The forces exerted create a torque that is horizontal toward the person, as shown in (Figure 5.113).



Credit: David de Hilster

Figure 5.114 Two Forces Acting on a Spinning Gyroscope

This same logic explains the behavior of gyroscopes. Figure 5.114 above shows the two forces acting on a spinning gyroscope.

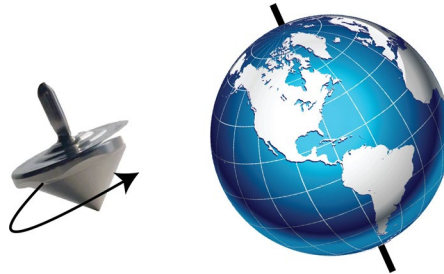
"The torque produced is perpendicular to the angular momentum, thus the direction of the torque is changed, but not its magnitude. The gyroscope precesses around a vertical axis, since the torque is always horizontal and perpendicular to L . If the gyroscope is not spinning, it acquires angular momentum in the direction of the torque ($L = \Delta L$), and it rotates around a horizontal axis, falling over just as we would expect."

In all likelihood, the vast majority of non-scientific individuals will not be able to understand the above explanations, especially the reasoning given for the direction of the angular momentum. On the other hand, physicists should have no difficulty. Even so, in the author's opinion, it will still be difficult for most individuals to mentally visualize the three-dimensional physical mechanism as to exactly how precession occurs.

5.6.3 Second Description

The second description is from the website:

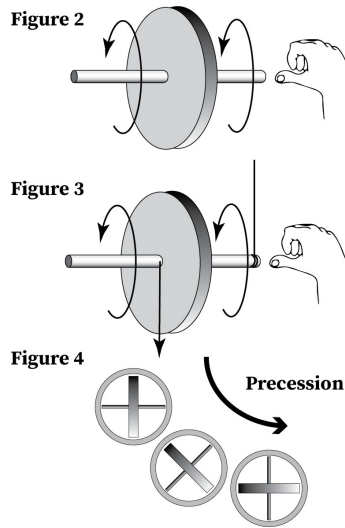
<http://www.schoolphysics.co.uk/age1619/Mechanics/Rotation>.



Credit: David de Hilster

Figure 5.115 Precession of the Gyroscope and the Earth

See Figure 5.115 above. One of the most fascinating examples of the effects of angular momentum is in the precession of tops and gyroscopes. The phenomenon of precession is shown by all spinning objects if a torque is applied to the axis of rotation, even the planet Earth!



Credit: David de Hilster

Figure 5.116 Direction of Angular Momentum

Before we can attempt to explain the way in which a gyroscope behaves, we must first realize that angular momentum, like linear momentum, is a vector. The way to work out the direction of this vector is shown in Figure 5.116 above.

”Imagine that the disc (D) is spinning in an anticlockwise direction about the axis A. The direction of the angular momentum of the spinning disc is found by considering a right hand gripping the axle with

the fingers curled round the axle in the direction of spin. The direction of the angular momentum vector is then in the direction in which the right thumb points.

"A string is now tied to one end of the axle, the axle is supported and then set spinning in an anticlockwise direction and the free end is then released (Figure 5.116, Figure 2). The weight (W) of the gyroscope acts downwards as shown, and this causes a torque to act on the gyroscope in a direction out of the paper.

"This causes a change in the angular momentum about the vertical axis, and so the gyroscope rotates in an anticlockwise direction about this axis when viewed from above (see Figure 5.116, Figure 4). This rotation about the vertical axis is called precession. Notice that there is no change in the angular momentum in a vertical direction."

Vis-à-vis this second description, moreover, for both the novice and the physicists, the contents will most likely be able to be grasped. Nevertheless, again, the underlying three-dimensional physical principles as to just how precession transpires are still not fully apparent.

5.6.4 Third Description

This third description is written by the author, however, first a quotation or two with reference to inertia/momentum.

Newton's first law states:

"An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force."

"Often called 'the law of inertia,' Newton's first law means that there is a natural tendency of objects to keep on doing what they're doing. Because all objects resist change in their state of motion, in the absence of an unbalanced force, an object in motion will maintain this state of motion." [Source: <http://teachertech.rice.edu/Participants/louviere/Newton/law1.html>]

The fundamental principle of a gyroscope is explained and illustrated below. Refer to Figure 5.117 and the following discussion.

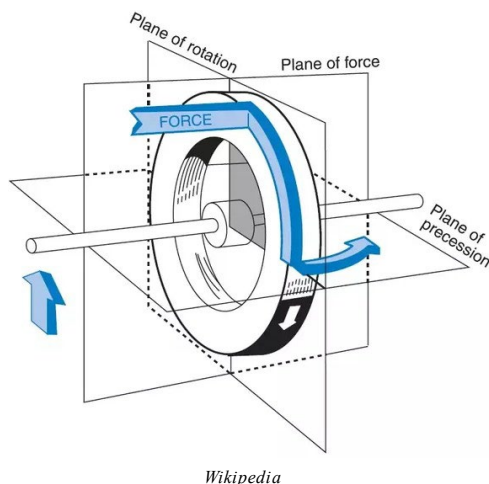


Figure 5.117 Direction of Force as a Function of Falling [Fair Use]

<https://www.physicsclassroom.com/class/newtlaws/Lesson-1/Inertia-and-Mass>

As shown above, the direction of force as a function of "falling" is shown at the top of the gyroscope. The force then produces momentum in the same direction. However, because of the gyroscope's rotation,

the force/momentum then shifts 90 degrees clockwise. This basic mechanism represents the underlying principle of precession, assuming it is applied over the entire 360 degrees of rotation.

As depicted in Figure 5.117 above, the fundamental principle of the physics of a gyroscope is as shown. As one can observe, because of rotation and due to the conservation of momentum, the direction of force/momentum/torque (falling) shifts 90 degrees clockwise. This same principal is applied in 90-degree segments over 360 degrees of rotation.

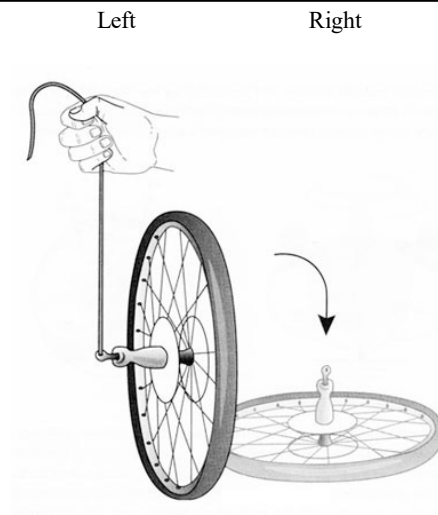
At this time, the author poses this query. Regarding modern-day physics, concerning gyroscopic function, in addition to the conservation of momentum, are we not really observing with a change in rotational direction, a conservation of force (torque)? →This hypothesis will be clarified later on in this section←.

Now, as just imparted above, figures 5.120 through 5.123 below depict the same basic principle of physics but now in much greater detail. In addition, this basic function is broken down into separate 90-degree segments over 360 degrees of rotation. This segmentation makes it comparatively easy to visualize the underlying three-dimensional physical mechanism of precession.

5.6.5 The Author's Explanation of the Function of a Gyroscope

At this juncture, please view each of the figures as offered below.

Then read the following explanations, provided in the captions and following paragraphs.



Wikimedia Commons

Figure 5.118 Stationary Wheel Falls Over [Fair Use]

The image on the left depicts a nonrotating wheel as initially positioned. Observe, under the influence of the gravitational field (in flow of space), it then "falls" to the Earth (torque) as revealed on the right.

The following figures 5.119 through 5.123 were acquired from the website listed below, nevertheless, with some superimposed modifications made by the author.

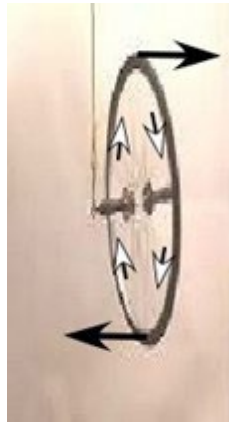
<https://umdphysics.umd.edu/>



University of Maryland, Dept of Physics

Figure 5.119 Spinning Wheel Maintains its Position [Fair Use]

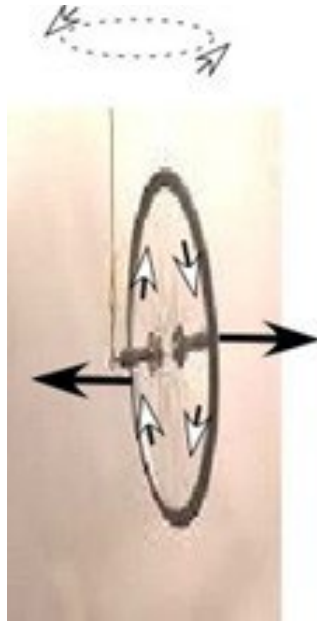
Now, in contrast to Figure 5.118, if the wheel is rotating, then relative to the string, it remains in its original 90 degrees orientation as pictured above. The reasoning is revealed as explained in Figure 5.123. However, in order to comprehend that figure, one must first view and understand figures 5.120 through 5.122.



University of Maryland, Dept of Physics

Figure 5.120 Starting Point 0 Degrees Rotation [Fair Use]

The wheel is rotating clockwise, and as the wheel attempts to "fall" towards Earth (torque), this action then produces two momentums/forces, furthermore, in the directions as shown above which are depicted by the two opposite-oriented black arrows. The torque does involve the pivot but for simplicity of explanation is not shown.



University of Maryland, Dept of Physics

Figure 5.121 90 Degrees of Rotation [Fair Use]

Next, as a function of 90 degrees of rotation, the orientations of the two forces/momentum "fall" presented in Figure 5.120 then change their directions, as shown in Figure 5.121.

This alteration of directions produces precession, because rather than the two forces/momentum/fall oriented vertically in opposite directions, they are now, at this time, pointed in the opposite directions horizontally.

The oblong circle, containing the two arrows, located at the top the Figure 5.121, symbolizes the function of precession. For purposes of orientation, the left arrow is directed out of the page whereas the right arrow is pointed into the page.

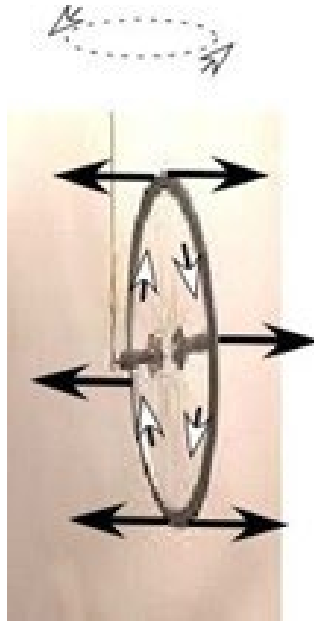


University of Maryland, Dept of Physics

Figure 5.122 180 Degrees of Rotation [Fair Use]

Following that, at 180 degrees of rotation, the two directions of the forces/momentums/fall are then positioned as above. As a result, they counteract the two forces/momentums/fall depicted in Figure 5.120. This coupled counteraction maintains the right-angled position of the gyroscope relative to the string.

Refer to Figure 5.123 below. If one takes the sum total of all the above forces/momentums demonstrated in figures 5.120 through 5.122, which do not counteract one another, then the remaining two forces/momentums/ (torque) produce precession (figures 5.121, 5.123, and 5.125). In addition, regarding figures 5.120 and 5.122, the counteracting forces/momentums maintain the gyroscope's right-angled orientation relative to the string as shown in Figure 5.119. And so, for that reason, it does not fall over as depicted in Figure 5.118.



University of Maryland, Dept of Physics

Figure 5.123 Wheel Does Not Fall [Fair Use]

The right arrow of the oval is pointed into the page. The top and bottom forces/momentums counteract one another; therefore, the gyroscope maintains its right-angled orientation relative to the string. Alternatively, the side forces/momentums are heading in opposite horizontal directions, therefore, are unbalanced. For that reason, or more to the point, there is precession.

5.6.6 The Author's Description of Two Experiments Relevant to Gyroscopes and Loss of Inertial Mass

The descriptions presented above explain the classic interpretation of the physics of a gyroscope. Nevertheless, it does not account for the loss of inertial mass, weight, or the elevating force as demonstrated by Laithwaite. So, at this time, let's return to potential experiments that confirm Eric Laithwaite's observations. These proposed experiments are basically an extension of his YouTube videos. Recall that when Laithwaite allowed the gyroscope to intrinsically precess on its own, it appeared to lose inertial mass or weight. In addition, when he forced motion in the direction the precession (forced precession), there was then a further lifting force exerted on the gyroscope. So as now presented below are two potential experiments relevant to Laithwaite theory.

Before proceeding, it should be noted that Eric Laithwaite has already performed the following two experiments, nevertheless, in a different form, so they are not new, moreover, already proven though not obvious on the YouTube videos. However, what now is different is this: The two tests described by the author can be performed at home or in any high school physics class. They are very simple. Again, his YouTube channel demonstrating his observations is given as below.

<https://www.youtube.com/watch?v=1eQp4grGdqY> See 20 min 51 sec.

An additional website related to these experiments can be found at:

<https://www.youtube.com/watch?v=NNLk5G3hgRg>

Experiment 1.

The experiment consists of a high-precision gyroscope (12,000 rpm), a central holder/stand, and a scale.

1. First, place the gyroscope and central holder on the scale.
2. Second, weigh the nonrotating gyroscope and holder/stand together.
3. Third, ramp up the gyroscope to 12,000 rpm; moreover, position its axis 90 degrees relative to the holder/stand, then let it precess.
4. Fourth, now during its precession, again weigh the gyroscope and holder/stand together.

Experiment 2.

The second experiment consists of a high-precision gyroscope (12,000 rpm), a central holder/stand, a turntable, and a scale.

1. First, place the gyroscope, turntable, and central holder/stand on the scale.
2. Second, weigh the nonfunctioning gyroscope, the holder/stand, and the nonfunctioning turntable all together.
3. Third, ramp up the gyroscope to 12,000 rpms, moreover, position its axis 90 degrees relative to the holder/stand.
4. Fourth, let the gyroscope precess. Again, weigh all of them together.
5. Fifth, activate the turntable in the direction of precession and, once again, weigh all three together.

Regarding Experiment 1:

It appears that during precession, the gyroscope loses some of its inertial mass.

- This explains why there is some reduction in measured weight (inertial mass).
- Additionally, it also is the reason why, when ongoing precession is blocked, there is then little or no force exerted upon the item that blocks it (reduced momentum = reduced inertia).
- Furthermore, it gives explanation for why, while the gyroscope precesses, there is little or no centrifugal force exerted on the stand/holder. In essence, for all of these phenomena to occur, there must be some reduction of the gyroscope's inertial mass.

What is more, in order to counteract the nonrotating portions of the gyroscope to prevent it from falling, there should also be a force, which maintains the gyroscope at a right angle relative to the string.

Now, Referring to Experiment 2:

In the scenario where there is forced precession in the direction of motion, there is an additional reduction in weight, moreover, the gyroscope's axis elevates. So in this situation, not only is there a further reduction in inertial mass, but there is now also a greater lifting force that elevates its axis from its original right-angle orientation (relative to the string). In other words, with forced precession, that force which maintains the nonrotating, and perhaps even rotating, portions of gyroscope (to prevent them from falling) at a right-angle increases, so the axis of the gyroscope then elevates. See Section 5.6.9, Page 272 for an alternative and somewhat contradictory theory/explanation concerning precession vs. forced precession.

The results of these two experiments cannot be explained by using modern-day theories. However, by employing PFGRT, the underlying cause and effect is clearly evident as clarified below.

So, if the ether exists, as virtually proved in Chapter 3, then everything in the universe is a function of that ether, including the workings of a gyroscope. Therefore, at this time, the author posits this alternative gyroscopic ether theory.

Before explaining how all this actually works, it will be helpful for the reader to review Chapter 2 (PFGRT), for only if one understands the concept the accelerating factor of the inflowing ether, can one then appreciate the above experiments and new theory.

For review, recall if an object, located far from a large astronomical structure, is accelerated by force, then the ether (space) resists the acceleration and so the object is compacted. This function is defined as inertia or inertial mass.

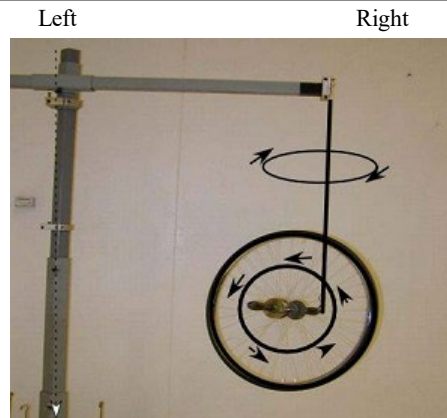
Conversely, if the inflow of ether accelerates the same object sited stationary on the Earth’s surface, moreover, the Earth blocks the object’s geodesic motion, then once again, it is compacted. This function is defined as gravity. Consequently, if the accelerations relative to the ether are equal, the compactions are identical. And so, gravity and inertia are equivalent.

Bear in mind that the **relative** acceleration of the object with compaction, **located specifically at the Earth’s surface**, moreover, as a function of the inflowing ether (acceleration factor), is then defined as its weight. This is how weight relates to gravity/inertial mass.

5.6.7 Author’s Description Regarding the Loss of Inertial Mass

At this point, let us now return to the function of a gyroscope. Given the PFGRT assumptions, as presented above, if one can reduce, or else counteract, the amount of the accelerating factor of the inflow of the ether (gravitational field) towards Earth, then for any affected object, gravity/gravitational field decreases. Consequently, its weight and apparent inertial mass also decrease. So how does a spinning gyroscope alter the inflow of the ether towards Earth?

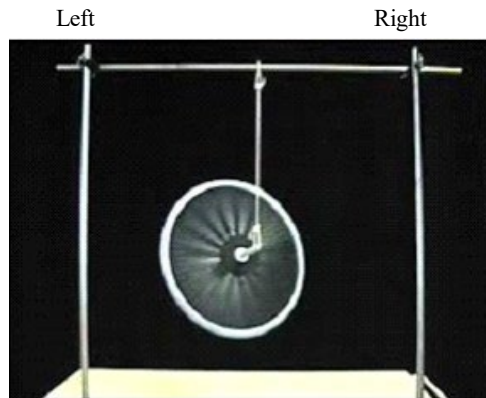
This postulate is pictured below with respect to figures 5.126 and 5.127. But first, before proceeding, moreover, concerning **this specific gyroscopic example**, its physical structure, orientation, and function are portrayed in Figure 5.124, and explained in the following paragraphs.



StackExchange with Modification

Figure 5.124 Direction of Precession

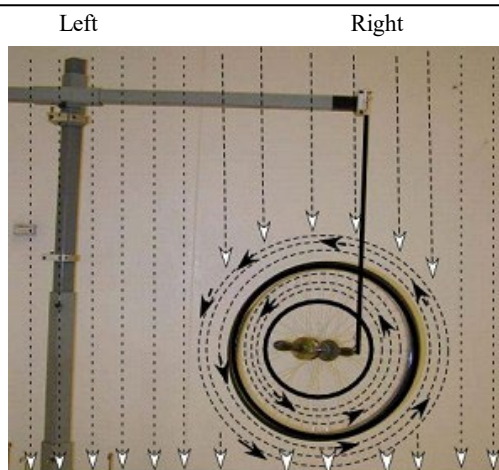
For purposes of orientation, the central pivot is directed into the page. Additionally, the central pivot is attached to the rim by struts, the latter of which are not shown. The black arrows associated with the gyroscope represent the direction of rotation. The oblong oval with arrows portrays the direction of precession with the left arrow oriented into the page, whereas the right arrow is pointed out of the page. Furthermore, the picture presented in Figure 5.125 below is for the reader’s orientation. It displays a better perspective with the wheel spinning counterclockwise and precessing clockwise.



Youtube.com MIT Department of Physics

Figure 5.125 Angle of Precession is Clear [Fair Use]

See Figure 5.126 below. The theory: The author posits that when the gyroscope disk's mass rotates, it then captures a portion of the linear inflowing ether, moreover, drags it into its own revolving motion as portrayed in Figure 5.126.

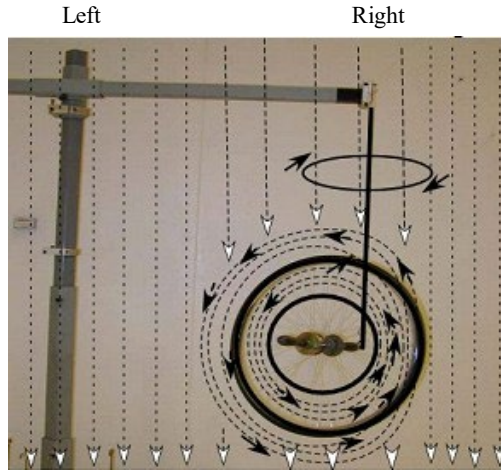


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Figure 5.126 Hollow Arrows Show Inflow of Ether [Fair Use]

The downward-oriented, dotted vertical-hollow arrows represent the inflow of the ether. A portion of the ether's linear inflow is captured, so it then revolves in synchrony along with the gyroscopic spin (circular solid arrows). Notice the captured spinning ether exists within the substance of the disk as well as outside.

As a result, when the gyroscope precesses, that portion of the captured spinning ether, on the side of the direction of precession (to the right) becomes compressed against the adjacent downward linear inflow as revealed below in Figure 5.127.



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Figure 5.127 Ether is then Compressed Against Right Side of Wheel [Fair Use]

As a function of precession, the right side of the captured spinning ether is then compressed against the linear inflow on that same side, so it becomes denser compared to the left side. Observe that the spinning captured compressed ether on the right side is moving away from Earth, but on the left side, the noncompressed spinning ether is oriented towards Earth.

Recollect the ether exists, not only surrounding the spinning gyroscopic disk but also within its own substance. Consequently, once again, on the side of the direction of precession, (right,) the spinning ether then becomes compressed, in essence, denser compared to the left. As a result, on the right, it crowds the downward linear inflow out. So, when comparing the two sides, there is less inflow (acceleration) towards Earth on the right as opposed to the left. For that reason, there is an overall reduction of the gyroscope's inertial mass or weight. It is also conceivable that there is a reduced inflow effect towards Earth because a portion of the inflow is captured, thus diverted, into a synchronous spinning motion along with rotating gyroscopic disk.

→More importantly←, on the right side, the captured, moreover, **compressed**, spinning ether accelerates the gyroscope's individual atoms upwards, in opposition to the ether's linear inflow (hollow arrows), the latter of which is directed towards the Earth. This as compared to the left side where the **noncompressed** spinning ether accelerates the gyroscope individual atoms towards Earth, in this case, along with the inflowing ether.

In effect, on the right, the upward **compressed** spinning ether, oriented in the direction away from Earth, has more acceleration effect upon the gyroscope's individual atoms compared to the left side, whereby the downward **noncompressed** spinning ether accelerates its atoms towards Earth.

All of the functions described above effect a reduction of the gyroscope's inertial mass/weight. This is Experiment 1. →This is crucial. Bearing in mind this model, the reduction of inertial mass/weight is **mainly** from a **net force** (compressed spinning ether) directed upon the gyroscope's individual atoms accelerating them upward and away from Earth←.

As for Experiment 2, this is the scenario where there is forced motion in the direction of precession (forced precession). Consequently, on the right, an additional compression occurs. For that reason, there is a further lifting force, exerted on the gyroscope's atoms.

This is because the now-increased, **compressed**, upwards-spinning ether further crowds out the downward-inflowing ether, moreover, further accelerates the individual atoms on the right side upwards, against the direction of the inflow. This is compared to the left side whereby the **noncompressed** converse function is oriented towards Earth.

Remember, the compression side (right) has more effect than the noncompression side (left), so overall the gyroscope's axis elevates. Concerning both experiments, only when the above orientational criteria are met does this effect occur. This is rationale for why when weighing a spinning gyroscope without precession, there is then no change of its weight or inertial mass. The outcome of reduced inertial mass only happens in the presence of precession (definitely with forced precession and perhaps/but not certain with nonforced precession).

5.6.8 Different Kinds of Experiments Versus the Loss of Inertial Mass

In the author's opinion, even though not readily apparent, precession is a function of the gyroscope's "free fall" to Earth. Essentially, the motion of vertical free fall towards Earth rotates into horizontal precession (free fall).

One cannot position the gyroscope in such a way that it cannot free fall, therefore, not precess, and still obtain reduced inertial mass/weight. Numerous experimenters have attempted to correlate a spinning gyroscope with reduced inertial mass/weight. Yet, if they do not let it free fall, thus precess (perhaps, with only forced precession; see below), they will fail to demonstrate a reduction in its inertial mass/weight.

In summary, the author believes that most or the vast majority, of experiments of this sort fail to let the gyroscope free fall or precess (perhaps again only forced precession). And for this reason, the experimenters are then unable to observe or measure reduced inertial mass.

As an aside, again assuming the gyroscope is in the upright position, there is no loss of weight/inertial mass (no precession). Consequently, in this scenario, where the axis of the gyroscope elevates, →from forced precession← **from a right angle relative to the string**, moving towards that upright position, there is then a balance between elevation from forced precession versus this counteracting second upright factor. As a result, the gyroscope's axis stabilizes at a given angle (< 90 degrees) relative to the string.

5.6.9 Precession Versus Forced Precession

It is evident that the reduction of weight or inertial mass is much more apparent with forced precession compared to intrinsic (nonforced) precession. The author acknowledges that numerous experiments have not demonstrated reduced inertial mass with pure precession alone. Alternately, the author posits forced precession will definitely produce a reduction of inertial mass/weight.

Now with reference to this concept, see the two YouTube videos offered below:

<https://www.youtube.com/watch?v=GeyDf4ooPdo> See 4:45 min

<https://www.dailymotion.com/video/x2ya0y4>

The first YouTube video is of intrinsic **nonforced** precession with the individual then providing a lifting force. Observe, the gyroscope does not lift by itself. The individual lifts it. The experiment demonstrated no loss of inertial mass or weight. But the lifting force performed by the individual should have caused increased weight during that particular lifting exercise. So, the loss of mass of the gyroscope and the lifting function exerted by the individual then counteracted one another resulting in no change of the weight measurements.

In the second YouTube video, whereby Laithwaite **forced the precession**, the test shows a definite loss of inertial mass or weight. Laithwaite did not lift the gyroscope; rather, the gyroscope elevated by itself during the interval of forced precession and then Laithwaite followed that motion.

This differential effect is not acknowledged in the above YouTube videos, so you will have to observe them and then make your own decision. In the author's opinion, forced precession demonstrates significantly more loss of weight (inertial mass) compared to intrinsic nonforced precession (the latter if at all).

5.6.10 Supporting Evidence for this New Theory/Postulate/Hypothesis

So what other evidence exists that supports the notion that this theory is correct?

First, during precession, if the gyroscope's movement is blocked, then the compression of the spinning ether in the direction of motion ceases. Consequently, the lifting force as a function of the upward compressed spinning ether also stops. As such, the gyroscope then immediately free falls towards Earth.

This outcome can be viewed at:

<https://www.youtube.com/watch?v=OpCEJO6V9g> See at 51 min 48 sec.

Second, if enforced motion, but in this scenario →against← the direction of precession, is initiated, then as a consequence, the compressed spinning ether is now located on side of the disk whereby it spins towards Earth. So instead of a lifting force directed away from Earth, which maintains the gyroscope at a right angle relative to the string, the force now generated is oriented towards Earth. For that reason, the gyroscope immediately free falls, moreover, is also further accelerated from an additional force directed towards Earth (downward force related to the spinning gyroscope plus the downward gravitational field force).

Again, this is what actually occurs as demonstrated in these videos.

<https://www.youtube.com/watch?v=OpCEJO6V9g> See at 4 minutes 45 sec to 6 minutes.

<https://www.youtube.com/watch?v=NNLk5G3hgRg> See at 33 sec.



<https://www.thestatesman.com/>

Figure 5.128 Gyroscope Sited on a Slanted Wire, Slides Down that Wire [Fair Use]

Third, as pictured above, a spinning gyroscope sited on a slanted wire, slides down that wire. In addition, while in the process of sliding, it repeatedly rebalances itself. For instance, at different times, it may tilt to one side then to the other, but if so, it then uprights itself. A video of this example can also be viewed at:

<https://www.youtube.com/watch?v=NNLk5G3hgRg> See at 4 min 22 sec.

Interrelating this observation to the author's hypothesis; as the gyroscope slides down the wire, whenever it tilts to one side, it then begins to precess. As a result, the upward-oriented, captured compressed spinning ether, in the direction of precession, produces a lifting force, which then counteracts the original tilt. As such, it then uprights itself. Moreover, this same function occurs no matter which way the tilt. Therefore, as it slides down the wire, whenever it tilts back and forth, it always rebalances itself. Take note of this additional factor: while sliding down the wire, this downward action/motion also causes the gyroscope to assume an upright orientation.

5.6.11 Another Hypothesis Regarding Gyroscopes and Inertial Mass

Before evaluating this section, it might be prudent to read Appendix N, which uses numerous illustrations to explain the weak equivalence principal, inertia, inertial mass, ether, acceleration, and resistance

from the ether. In the author's opinion, for the average individual, diagrams elucidate these concepts much better, as portrayed in Appendix N, compared to a written description. Also, before proceeding, please review specific portions of Chapter 2 (see pages 36 to 46). While reviewing those pages, take note of the symbols IAA, IAR, LSA, as well as the terms "the velocity factor" and "acceleration factor" relevant to their definitions. One must understand the meaning of those symbols and terms before one can successfully evaluate the following attributes.

The section that follows is extremely abstract, so to help in comprehension, it will be explained by employing numerous and varied visual perceptions. Hopefully, this repetitive methodology described from different perspectives will ultimately aid the reader in grasping the complex concepts as now presented.

That which follows is somewhat lengthy but necessary in order to understand why gyroscopes lose inertial mass during precession. The writer posits another hypothesis relevant to the function of a gyroscope. However, in order to give explanation to this concept, first the following sixteen basic attributes are offered.

1. Recollect, as revealed previously in Chapter 2, that the inflowing ether frame possesses a \rightarrow velocity factor \leftarrow as well as an \rightarrow acceleration factor \leftarrow . The following assumptions refer to only the acceleration factor (IAA), which has two basic functions/aspects as defined below. Additionally, at least for now, in order to avoid confusion and to simplify the explanations, the velocity factor concept will be ignored and dealt with at another time and place (Appendix N).

2. The accelerating factor of the inflowing ether (IAA, aka free-fall ether frame), moreover, acting alone upon an object, consists of two separate aspects, which are distinct but still interconnect—the "falling force aspect" (dependent on atomic weight) (IAA*) and the "acceleration aspect" (independent of atomic weight) (IAA**).

3. Explained with more detail: When an object free falls/accelerates to Earth (acceleration aspect) (IAA**) in geodesic motion, there is no resistance, therefore, no compaction, thus no inertial mass. Accordingly, all objects, including those of different atomic weights, accelerate/fall at the same rate. Discern that the rate of fall (acceleration) is identical for all objects regardless of atomic weight; it is independent of atomic weight. \rightarrow This is the weak equivalence principle \leftarrow .

4. On the other hand, the falling force aspect (IAA*), which produces a free-falling object, varies; it is dependent on atomic weight.

5. Assume the resistance from the ether, which is a function of the acceleration of objects, relative to itself (ether) by an outside force (e.g., rocket, LSA) is what produces inertial mass. So if there is no relative acceleration, there is no resistance = no inertial mass. And if there is no inertial mass/resistance, then the falling force aspect (IAA*) will accelerate all objects equally, independent of their different atomic weights (**because there is no resistance/inertial mass**). Essentially, it becomes the acceleration aspect (IAA**). Discern they are one and the same. This is how the falling force aspect (IAA*) and the acceleration aspect (IAA**) interconnect (IAA = IAA* + IAA**). For this reason, atoms of different atomic weights free fall at the same rate, but their falling forces will differ.

6. In summary, the acceleration aspect (IAA**) exerted on falling objects is independent of atomic weight, so equal. Consequently, objects of different atomic weights, then free fall/accelerate at the same rate. Alternatively, the falling force aspect (IAA*) vis-à-vis free-falling objects (geodesic motion) is dependent upon atomic weight, thus diverse—so the force of falling exerted on those objects varies as a function of atomic weight (IAA*). Recognize if there is no inertial mass (resistance to the force), then the falling-force aspect (IAA*) accelerates objects of different atomic weight equally. For this reason, the falling-force aspect (IAA*) and the acceleration aspect (IAA**) are the same thing—the weak equivalence principle.

The concepts, as just defined, refer to only the acceleration factor (IAA) and its two basic functions the falling force aspect (IAA*) and the acceleration aspect (IAA**). Alternatively, the following definitions explain how the resistance from the ether interrelates with the attributes as just presented.

1. The inertial mass of an object is not the intrinsic property of the object as classically assumed. Rather, it is the object's interaction with the ether, which produces that inertial mass. Both entities are required, the accelerating object ($F = ma$, LSA) and the responding resisting ether (IAR), in

opposite directions, resulting in compaction. And so, if there is no accelerated interaction with compaction/resistance, there is no inertial mass.

2. The inertial mass of an object is a function of its acceleration (e.g., rocket, LSA) relative to its own associated adjacent/internal ether, therefore inducing resistance from that frame (IAR) = compaction. Recall, the ether exists within the object as well as surrounding it, thus the term adjacent/internal.

3. If an object is at rest with the ether or at a velocity relative to the ether, then there is no accelerated interaction (compaction = no inertia/inertial mass). As such, the object is weightless in geodesic motion. In that setting, we assume the object possesses inertial mass. However, the only way to demonstrate/prove inertial mass is to accelerate it (LSA) with respect to its own accompanying adjacent/internal ether.

4. Essentially, if the object is in geodesic motion, there is no way to prove that it possesses inertial mass. So the author posits this basic assumption: →An object in geodesic motion does not possess inertial mass; for in that setting, there is no accelerated interaction with its own adjacent/internal ether. Again, for that object, if there is no compaction, there is no inertial mass←.

5. As a corollary, when an object free falls to Earth, from the acceleration factor of inflowing space (ether) (IAA = IAA** + IAA*) without opposing resistance = no inertial mass, it is weightless in geodesic motion. But most importantly, it is at rest with its own adjacent/internal-synchronized acceleration of the inflowing ether (free-fall ether frame). This last concept is very abstract, because the free-falling object is a product of the acceleration factor absent resistance (IAA = IAA** + IAA*). However, unless the object is further accelerated (e.g., rocket, LSA) with respect to its own free-fall ether frame, inertial mass cannot be proved or demonstrated.

6. This theory posits that when an object is at rest with the ether at a velocity relative to the ether, or at rest with its own adjacent/internal-synchronized, accelerating, inflowing ether (IAA), it then possesses no inertial mass (no compaction).

7. Only when an object is accelerated by an outside force, (e.g., rocket, LSA, $F = ma$) relative to stationary ether, velocity of ether, or again relative to its own adjacent/internal-synchronized accelerating inflowing ether (IAA), all with responding ether resistance/compaction, does it then exhibit inertial mass. In all other settings, it manifests no inertial mass.

8. →In the simplest terms, the concept is this: Whenever an object is in geodesic motion (weightless), then at that time, in and of itself, it possesses no inertial mass←.

9. The inertial mass of an object is a function of its acceleration (or relative acceleration) applicable to its own adjacent/internal ether by an outside force ($F = ma/LSA$), furthermore, with an opposing resistance generated from that ether frame (IAR) = compaction. Essentially, only as a product of compaction is inertia then present. On the other hand, it is not inversely related to the inflowing ether's individual atom acceleration (IAA) exerted upon the object without resistance, whereby there is no compaction. So, without the object's compaction, one cannot prove or demonstrate inertia or inertial mass.

10. To recap, imagine in your mind a free-falling object in geodesic motion. The object's motion is a product of both the acceleration aspect (IAA**) and the falling force aspect (IAA*), which are separate functions; nevertheless, they still interconnect (IAA = IAA* + IAA**). Accordingly, objects of dissimilar atomic weights free-fall equally; nevertheless, their falling forces differ dependent upon atomic weight. If there is no resistance (inertial mass), then the falling-force function (IAA*) accelerates all objects equally, it transforms into the acceleration function (IAA**). This is how the falling force function (IAA*) and the acceleration function (IAA**) interrelate (IAA = IAA* + IAA**). →In actuality, they are one in the same←. It is only when the free-falling object is further accelerated relative to its own already-accelerated frame, free-falling ether frame (IAA), such as from rocket (LSA, $F = ma$), that the resistance from the ether then emerges. So at that time, the object becomes compacted/inertial mass.

So let us now apply these principles to our FW example.

Again, recall the Ferris wheel (FW) illustration as presented earlier in this chapter, →which assumes no friction←, moreover, continuous/endless rotational motion (centripetal acceleration) devoid of energy input. See Section 5.2.4, especially pages 181 and 182. With reference to that specific example, the author experienced compression while moving away from Earth but weightlessness traveling towards Earth. Notice, inertia (compaction) only occurs while moving in the direction from Earth; nevertheless, the compression effect does not alter the rate of rotation (FW).

The reasoning behind this is: On the left side, the direction of rotation of the FW is oriented along with the linear inflowing ether frame (IAA). →This function is →somewhat similar← to the free-falling motion of an object or its geodesic motion, moreover without resistance = independent of atomic weight = no inertial mass (IAA**)←.

Alternatively, while moving from Earth (right side of FW), the inflowing ether frame (IAA), now in the opposite direction of rotation, is precisely equal to the left side (FW); however, at this time, there is compaction partially a function of atomic weight. Remember, on the right side, the FW's rotational motion is oriented against the inflowing ether frame. →This second function is →somewhat analogous← to an object's acceleration from force (LSA) relative/against the inflowing ether frame with its associated opposing resistance = dependent on atomic weight = compaction = inertial mass/inertia (IAR)←.

Keep in mind, the radial centripetal acceleration force remains constant, so the FW continues to rotate without change, even in the face of compaction (inertia) on the right side.

With respect to our FW scenario, the most crucial concept to take home and remember is this: The force derived from the same linear inflowing ether frame (e.g., gravitation field) is equal and symmetrical on both sides (FW); even so, the author's experience of compaction/inertia produced only on the right side had no effect on the FW's rotational rate.

Please pay attention to these last two paragraphs; at the end, a fundamental question is posed. Finally, one last time, this FW model presumes, but now expressed in layman's terms, that the linear downward force produced by the gravitational field is equal and symmetrical with respect to both sides of the FW. As a result, there is no initiation or alteration of rotation induced by gravity (assume no friction). All the same, upon commencement of rotation, if not already rotating from an outside torque, counterclockwise, there is compression/compaction present only on the right side (FW). Yet, this compaction effect does not alter the Ferris wheel's rate of rotation (radial centripetal acceleration/tangential angular velocity). Think about this fact/observation very carefully. Both linear inertia (compression) and its corollary linear momentum (compression) are associated with a change in linear/translational velocity, increased or decreased—not so in this scenario. Nor does the compaction effect on the right result in a change in the radial acceleration/tangential angular velocity of the FW.

So, here is the fundamental question. How does one explain this FW example as just presented with the use of modern-day classic physics? For the average individual, this hypothesis/question is most likely very confusing. For mainstream science, it is probably a conundrum in which if there is no answer; then it requires an entirely new physics. Again, to all physicists/scientists, answer this basic inquiry: →By what means can you explain this FW example/model by using the classic excepted/standard laws of physics?← If you can't, there must be another solution. That answer is given below.

In summary, a new physics?

- Our concepts of inertia and inertial mass all involve compaction/compression.
- Force is distinct from inertia. Force exerted on an object can occur independent of inertia (resistance with compaction) such as a free-falling object = no inertial mass/no compaction.
- This theory posits that when an object is at rest with the ether, at a velocity relative to the ether, or else at rest with its own adjacent/internal synchronized-acceleration of the inflowing ether, it then possesses no inertial mass (no compaction).
- Only when an object is accelerated (e.g., rocket-LSA) relative to stationary ether, velocity of ether, or again, with respect to its own adjacent/internal synchronized-acceleration of the inflowing ether all with compaction, does it then exhibit inertial mass. In all other settings, it manifests no inertial mass.
- →In the simplest terms, the concept is this: Whenever an object is in geodesic motion (weightless), then at that time, in and of itself, it possesses no inertial mass←.
- The inflowing ether frame (IAA) has a velocity factor as well as an acceleration factor. The following assumption refers to only the acceleration factor. The accelerating factor of the inflowing ether (IAA), moreover, acting alone upon an object, possess two separate functions which are distinct; even so still interrelate →the falling force aspect (dependent on atomic weight) (IAA*) and the acceleration aspect (independent of atomic weight). (IAA**)←. And if there is no resistance to the falling force aspect (inertia), it becomes the acceleration aspect—they are one and the same.

- Given the assumption as just presented, then picture a free-falling object in geodesic motion. The object's motion is a product of both the acceleration aspect (IAA**) and the falling force aspect (IAA*), which are divergent. Nevertheless, they still interconnect with one another. As a result, objects of different atomic weights free fall at same rate but their falling forces differ, the latter dependent upon atomic weight.

- Inertia is a product of the resistance from **only** the ether (IAR) exerted on an object being accelerated by an outside force, such as a rocket (LSA). Furthermore, the amount of resistance is a function of the change in the object's velocity or relative velocity (acceleration relative to the ether), as well as its atomic weight.

- →Another way of perceiving all of this now expressed in a more vernacular form is: The accelerating factor of the inflowing ether (IAA) acts upon each separate atom within the object individually without compaction (no inertia). Consequently, there is symmetry between the acceleration of the ether and the accelerated motion of the objects. On the other hand, whenever this combined synchronized motion is disturbed/changed from an outside force ($F = ma = \text{rocket} = \text{LSA}$), not part of the ether, then this very same ether resists that change (again acting upon individual atoms), resulting in compaction (inertia)←.

- As a partial analogy (and the author emphasizes partial), the flow of a river will carry with its own motion a heavy metal boat, a light wooden canoe, and a feather equally (in synchrony), even considering their different atomic weights and sizes (somewhat comparable to the weak equivalence principle). Subsequently, with respect to this combined synchronized uniform flow, if the motion of only those objects is equally obstructed by a fixed structure but not the movement of the river, then from those objects there will be different amounts of force (momentum/inertia) exerted on that blocking structure. Recognize that the drift of the river is to some degree analogous to the inflowing ether frame (IAA), and the fixed structure is somewhat similar to acceleration (deceleration) of those three objects by an outside force ($F = ma$, rocket, LSA) relative to that flowing frame (the synchronized motion of the objects and the flowing river)—resulting in compaction of the objects.

- Finally linear acceleration and rotational centripetal accelerations are two separate independent functions, perhaps not associated with the same laws of physics. This is why Laithwaite's experiments/demonstrations relevant to gyroscopic function, combining both functions in the real world are so confusing, at least on the surface, not compatible with all of Newtonian physics.

As an aside, scientists have successfully floated a frog in a very strong magnetic field. Therefore, in this case, the accelerating factor of inflowing space (IAA) acts on each individual atom within the frog directed towards Earth and the magnetic field acts on each individual atom within the frog away from Earth, so no compaction. Now, here is the key question: Does the entire apparatus weigh the same with the frog floating versus with frog not floating. If it weighs less, this experiment is a potential validation of this compaction/inertia/inertial mass hypothesis.

See <https://www.youtube.com/watch?v=2VIW0nYfN3A>

The attributes, as just presented, will now be used to construct a theory, which gives explanation to the reason why, when a gyroscope precesses, it loses some of its inertial mass. There are two basic premises.

Premise 1. Recall as explained earlier in this chapter, when the gyroscope's disk rotates, it captures a portion of the linear inflowing ether, moreover, drags it into its own spinning motion as depicted in Figure 5.126. For that reason, the angular acceleration of the atoms of the spinning disk are then in synchrony with respect to its own adjacent/internal captured, angular, accelerating spinning ether. So, relative to each other, they are at rest.

Accordingly, with reference to →only the spinning disk←, there is no inertial mass generated, since overall, there is no relative acceleration of its atoms compared to its associated captured spinning ether.

Premise 2. Now, whenever a gyroscope rotates, moreover, precesses, even though not readily apparent to the casual observer, it is, in fact, →free falling towards Earth in geodesic motion←. Therefore, as posited earlier, it exhibits reduced inertial mass.

As a result of these two premises, moreover, with reference to this specific right-angle orientation, a gyroscope, while undergoing precession, possesses reduced inertial mass. This explains the reason why

when a gyroscope's ongoing precession is blocked, there is then no momentum/inertia exerted upon the item that blocks it.

Whenever precession is obstructed, the gyroscope rather than undergoing precession, which is a form of free falling, then resumes classic defined free fall, but at this time, directed towards Earth. This is because at the instance of obstruction, there is then no compression of the upward captured spinning ether. Recollect, precession is what produces the lifting force that maintains the gyroscope's right-angle orientation relative to its string. So, when this function terminates, the gyroscope then reorients its motion from precession (a form of free fall) to classic free-fall acceleration towards the Earth.

The author also posits one other alternative hypothesis regarding decreased momentum exerted upon an object that prevents ongoing precession. So, as a second possibility and only an option, the reduced momentum effect may be a partial function of whenever ongoing precession is blocked—the gyroscope's geodesic motion immediately changes direction. In other words, precession (a form of free fall) rather than being directed at the item, which prevents it, then ceases; moreover, immediately it begins to naturally free fall towards Earth. Essentially, this almost →instantaneous reorientation← of two forms of geodesic motions is perceived as decreased momentum exerted upon the item, which inhibits ongoing precession. In addition, the perceived loss of inertial mass also explains why during precession, there is a reduced centrifugal force exerted on the gyroscopic holder. This observation is evidenced at:

<https://www.youtube.com/watch?v=OpCEJO6V9g>. (See at 19 minutes 51 sec.)

5.6.12 Gyroscopes as a Partial Function of Force

If the reader will recall, earlier in this chapter, the author posed a question: Is gyroscopic precession a function of momentum or force? The author believes it is partly from force, and here are some reasons why.

- Whenever a gyroscope precesses, it actually is free falling toward Earth, moreover, in geodesic motion. This free-fall motion (precession) is a function of **force** derived from the accelerating factor of the inflowing ether.

- Precession is the product of a torque, two **forces** pointed in opposite directions. In effect, a torque represents coupled **forces**. Precession is actually the function of the vertical free fall of the gyroscope from a gravitational **force**, however, now shifted 90 degrees horizontally but with **reduced inertial mass**, as already explained.

- In addition, while undergoing precession at a right angle, whenever mass/weight is added (**force**) to the nonrotating portions of the gyroscope, the precession rate increases. Again, precession is a coupled force (torque). So, if the **force** of free fall is increased due to added weight, then the coupled forces of precession with a **reduced inertial mass** also rise proportionally. As a result, the precession rate increases, consequently inducing an added upward force, which then counteracts the added weight.

- Not all parts of a gyroscope lose inertial mass, so relative to the string, in order to maintain the nonrotating portion of the gyroscope at a right angle, a counteracting force must be present thus preventing the gyroscope's movement to Earth.

- In summary, the precession of a gyroscope superficially appears to be a function of inertia or momentum, but in actuality, it involves mainly force. Presupposing that predominantly, force is involved, the author posits the following logic.

- Assuming a closed system, furthermore, involving only momentum/inertia, one cannot propel that closed system.

- Alternatively, as described earlier in this book, again pertaining to a closed system, by using force, one can propel that closed system. See Chapter 5 (railguns/box).

- Therefore, by using multiple gyroscopes, it should be possible to construct a spacecraft (closed system) which can self-propel devoid of a propellant.

- The topic of gyroscopic propulsion will be dealt with later on in this section. However, the point of logic is this: If the precession of a gyroscope involves force, then multiple gyroscopes can be utilized to self-propel a closed system without a propellant (spacecraft).

See website: *<https://ok.ru/video/90762578558>*

5.6.13 Further Discussion Regarding Inertial Mass

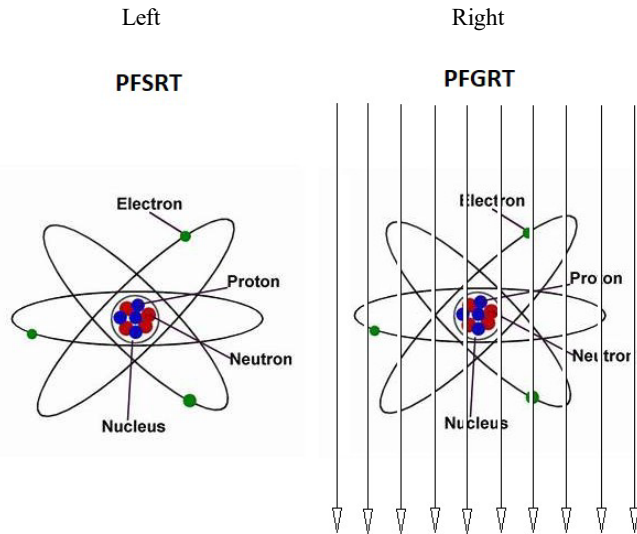
Regarding inertial mass, this new novel hypothesis leads to a conflict with Chapter 4’s theory of the origin of inertial mass. By logic then, one or the other may be an erratum or even both. So to resolve this dilemma, the author posits this potential hypothesis. The methodology for explanation is as follows:

1. First, the original concept of inertial mass as proposed in Chapter 4 is represented.
2. Second, the new theory regarding inertial mass of Chapter 5 will again be discussed.
3. Third, Chapter 4’s theory on inertial mass will be subsequently modified, so it is then compatible with this new alternative premise of Chapter 5.

First, recall and review: When an electron (field) possesses an increased velocity relative to the ether of PFSRT, its velocity magnetic field (VMF) then also increases. In addition, as the electron’s velocity increases linearly, the velocity magnetic field increases by a Lorentz transformation function (LTF). →**The velocity magnetic field represents its relativistic inertial mass**←.

Now, generally, although not exclusively, electrons are not solitary entities; rather, they orbit a nucleus. Thus, while in orbit, they possess a velocity relative to the ether of PFSRT. As a result, a magnetic field forms. This is not their intrinsic revolving (spin) magnetic field (SMF), rather their orbital velocity magnetic field (VMF). And so, assuming an atom is overall at rest with the PFSRT, its orbiting electrons are not. (See Figure 5.129 below.) As a result, the electrons produce (VMFs).

If you think about it, the overall rest inertial mass of an atom is actually a function of the relativistic inertial masses (VMF) of all its rapidly orbiting subatomic entities. This is because as they orbit, they all travel at a high velocity relative to the PFSRT. And as a result, they possess relativistic inertial masses. The total sum of all those subatomic relativistic masses is the rest inertial mass of the atom.



Wikipedia

Figure 5.129 Relativistic Mass is the Rest Inertial Mass of the Atom [Fair Use]
 Left = Rest Mass; Right = Relativistic Mass

- The figure and discussions above and below focus initially on the electron. However, in the following paragraphs, the ideas presented for the electron will then be broadened to encompass all of the atom’s subatomic units.
- On the left, by definition, the overall atom is at rest with the ether (PFSRT); nevertheless, its orbiting electrons are not. For that reason, the velocity of each electron, relative to the ether of PFSRT, is equal to its own orbital velocity around the nucleus. Consequently, they all then possess relativistic inertial mass.

Therefore, the sum total of the relativistic masses of all the electrons is the \rightarrow **rest inertial mass** \leftarrow of the atom.

- On the right, the overall atom possesses a velocity relative to the inflowing ether (PFGRT) as symbolized by the downward vertical dotted arrows. In this setting, the velocity of each electron relative to the ether is equal its own orbital velocity around the nucleus plus the velocity of the inflowing ether. In this scenario, the sum total of all the relativistic masses of all the electrons is now the \rightarrow **relativistic inertial mass** \leftarrow of the atom. The same effect holds true when an atom possesses a velocity relative to the ether PFSRT.

- The above description involves only electrons, which cannot account for the total inertial rest mass of the atom. So now let's broaden the concept. Within the internal structure of atom, all of the subatomic units (fields) in one form or another are in orbit, including quarks (protons neutrons—all fields). As for the later [nucleus], they all revolve around one another relative to a theoretical physical center-point—there is no particle, only revolving fields. Therefore, they all possess a velocity with respect to the ether of PFSRT/PFGRT.

Consequently, regarding these entities, moreover, as a function of the orbital velocities, they produce relativistic inertial masses, analogous to the electron model just presented.

- In the case whereby the overall atom is at rest with the PFSRT, the sum total of all the subatomic VMFs produces, for that atom, its rest inertial mass as shown on the left side of Figure 5.129. Basically, the sum total of the relativistic masses produced by all the orbiting subatomic entities is the rest inertial mass of that atom.

- Alternatively, if the overall atom possesses a velocity with respect to the PFSRT/PFGRT, then the VMFs produced by all the orbiting subatomic entities is now the atom's relativistic inertial mass as shown on the right of Figure 5.129.

- Notice, the relativistic inertial mass is greater than the rest inertial mass, because, regarding the former, all the subatomic entities overall possess a greater velocity relative to the ether.

Second, the inertia of the overall atom only manifests itself if it is accelerated relative to its associated ether with compaction. Inertial mass requires an ether, moreover, acceleration of an object with respect to that adjacent/internal ether. This concept is not so simple. This acceleration of the atom by an outside force (e.g., rocket) manifesting inertia is—relative to stationary ether, relative to a velocity of the ether, as well as relative to synchronized adjacent internal accelerating ether (e.g., additional acceleration relative to a falling object in geodesic motion as a function of a gravitational field). Alternatively, when an object exists in the state of geodesic motion, it does not possess inertial mass, because in that setting, there is no relative acceleration with respect to the ether and the resulting compaction.

Third, referring to the first theory of Chapter 4, regarding an atom at rest with the PFSRT, all the subatomic orbiting entities summed together possess no specific direction, because as they orbit, they directionally counteract one another. Alternately, with reference to the second theory of Chapter 5, because the atom possesses an overall accelerated direction through the ether, there is then also an overall direction relative to the sum of all its subatomic units (VMFs). Therefore, inertia is not only a function of acceleration relative to the ether, but it also has, relative to an overall atom, a directional component as well. The author admits this is a speculative theory.

5.6.14 Propulsion Using Gyroscopes

In practical terms, what does this gyroscopic presentation signify? It means one can utilize the ether to produce propulsion, somewhat analogous to how one tacks against the wind with a sailboat.

A hypothetical propulsion device based on this concept is now offered. To start with, please review the Eric Laithwaite video:

<https://www.youtube.com/watch?v=OpCEJxO6V9g> See 44 min 40 sec.

In the video, Laithwaite reveals a specific function associated with a gyroscope. Although not acknowledged in the video, that particular principle can be used to propel a spacecraft. The structure and function of Laithwaite's experiment is presented below.

1. The experiment, in part, consists of a gyroscope fixed and with its axis longitudinally fastened to a pole.
2. The other end of the pole is attached to a central stand containing a holder, in such a way that gyroscope/pole combination (GPC) is able to free fall towards Earth. The holder also allows the gyroscope/pole to circle around at a right angle.
3. At the location of the holder, there is a spring, which gauges the weight of the (GPC) by moving up or down.
4. The gyroscope is then ramped up, moreover, allowed to self-precess at a right angle relative to the stand (holder).
5. As such, the GPC circles around the central stand, moreover, without producing a significant centrifugal force.
6. Furthermore, in the scenario where there is forced motion of the GPC in the direction of precession, the GPC axis then rises. At the same time, the spring indicates the GPC has lost weight (forced precession).
7. Therefore, forced rotation in the direction of precession must have produced an upward lifting force on the GPC.

The above account is the physical structure, moreover, functionality of Laithwaite's experiment as demonstrated on the web video. So, at this point, let us rearrange, furthermore, expand this model to hypothetically produce a spacecraft, which self-propels without a propellant.

To start, imagine, instead of only one GPC, envision now there are four identical ones. In addition, picture in your mind that they are all symmetrically organized in a circular plane around the central holder, moreover, at a right angle. An important concept to recognize is this: Each CPC is attached to the same central holder, moreover, allowed to free fall towards Earth. Essentially, it must free fall in order to function properly.

Next, picture that all four gyroscopes are ramped up in the same rotational direction and at precisely the same angular velocity. They are then allowed to self-precess. After that, envision, analogous to Laithwaite's experiment, that forced motion of the entire planar structure is initiated in the direction of precession.

Presuming the Laithwaite experiment is legitimate, and with reference to the plane of the structure, the combined \rightarrow net \leftarrow central vector force produced by all four gyroscopes as a function of forced precessional motion is in the upward direction oriented directly away from Earth.

After that, visualize that on the underside of this apparatus, relative to its plane, moreover, along the axis of the central holder, a mirror image structure is assembled, in such a way that that all four of these second set of gyroscopes can still free fall towards Earth, similar to the top half. So relative to both halves, all gyroscopes can free fall to Earth.

Furthermore, conceptualize at the location of the central holder, that both planar halves are attached to each other, nevertheless, allowed to rotate independently, relative to each other. As a result, the top planar structure can rotate in one direction, whereas the bottom assembly can rotate in the opposite direction.

Now, with respect to the top half, assume the precession is oriented in one direction, whereas the bottom half is equally oriented in the opposite direction. What is more, pertaining to each side, presume equal forced motion/precession is initiated in the same direction as the gyroscopic precession on that side.

Given all of the above, moreover, in association Laithwaite's demonstration, if one observes the \rightarrow net forces \leftarrow generated by all eight gyroscopes, they are all in the same upward direction away from Earth. As a result, this device can be used as a model for the construction of a spacecraft, which can self-propel without a propellant.

Listed here are YouTube channels demonstrating some of the principles involved.

<https://www.youtube.com/watch?v=BeO91URF7dM>

https://www.youtube.com/watch?v=Taj4VAiL_vw

<https://www.youtube.com/watch?v=MmtOAfrGnw0>

5.6.15 Propulsion with Magnetic Fields

As previously elucidated (Chapter 4), inertial mass is a function of magnetic fields (VMF). Within an object, the greater the summation of the opposing magnetic fields (VMF), the greater is its inertial mass.

Recall in theory, a solitary electron at rest with PFSRT possesses no VMF, therefore, it possesses no inertial mass. And an electron at c , with respect to the PFSRT, possesses an infinite VMF, so an infinite relativistic inertial mass. You can now picture in your mind the rationale for why matter, including the electron, cannot be accelerated faster than the speed of light.

Therefore, if one can manipulate/diminish or change all of an object's internal magnetic fields (VMF is the inertial mass of the object), one should then also be able to markedly reduce its inertial mass. But most importantly, at the same time, by using other magnetic fields, propel that object devoid of a propellant, then this would be another form of spacecraft. All of this has been described in prior sections of the chapter.

In addition, reducing the VMF would enable the object to exceed the speed of light (and avoid time dilation). The explanation is as follows.

The limiting factor for an object not exceeding the speed of light is its infinite relativistic inertial mass as a function of the resistance from the ether, which in turn is a function of the VMF. So, if there is no inertial mass (VMF), then there is no barrier to exceeding the speed of light. Consequently, if one can eliminate the VMF (inertial mass) of an object, one can also accelerate that object to a velocity faster than the speed of light.

This reflection leads to the taboo subject of UFOs. For most of recorded history, numerous individuals have reported flying craft defying the present-day assumed laws of physics. Additionally, many of these individuals were/are extremely reliable. Moreover, there have been so many of them, that it is unreasonable to assume that all their stories are fabrications. Furthermore, is it rational to presume that we on Earth are the only intelligent beings in the universe? I think not. What is more, we now know that most stars possess planets; there must be trillions of them. Some must be inhabitable. Given all this then, it is not irrational to propose that some UFOs represent spacecraft from alien civilizations. →In other words, there are others←.

Assuming all of this is apropos. Moreover, considering the observed physical behavior of UFOs, our present-day concepts of the physics of the universe is in erratum. There must be a totally unrecognized physics, since 50-ton UFOs accelerate in a flash, execute 90-degree turns with extreme velocity, emit EMP, moreover, travel in space (ether) without an apparent propellant. Essentially UFO's appear to exhibit no inertial mass.

So again, if inertial mass is partially a function the magnetic field (VMF), as proposed by this book, then if one manipulates that field (VMF) by a pulsed magnetic field and reduces an object's/spacecraft's inertial mass while propelling it at the same time, then one could build a superluminal functioning craft without a propellant. Fundamentally, a pulsed magnetic field could be used to neutralize the VMF (inertial mass) and simultaneously propel the craft. **This functionality is similar to what is observed with UFOs.**

It is the author's opinion, that some form of combination of the ideas presented within this publication can be utilized to construct, power, and propel such spacecraft by utilizing magnetic fields and the ether. If so, then we as a species (grandchildren) are eventually going to travel to the stars. We shall see how the future unfolds.

5.7 Conclusion

Einstein's SRT/GRT unlike QM are mathematical theories with some highly significant concepts, although some but overall, very little everyday useful value. Alternatively, considering the ideas/experiments/theories presented within this article, PFSRT and PFGRT are highly practical theories, furthermore, most likely eventually profitable. As such, given sufficient time, it is the author's opinion this pragmatism will give impetus to overturn relativity.

In addition, the majority of, although not all of, the concepts presented in this book are not original. What the author has done is to assemble disparate concepts postulated by many others into one comprehensible visual form, without the use of mathematics. The author, as in his actual profession, is more

of an assembler of images rather than an originator. Most ideas, but not all, presented within this writing were found while surfing the internet over the last ten years, moreover, not obtained from scientific journals. However, adequate records were not kept, so there are no typical references/bibliography. Nevertheless, some of the major concepts were obtained by attending the Natural Philosophy Alliance (NPA) conferences and also derived from Henry Linder's Flowing Space articles as listed below.

<http://henrylindner.net/Writings/BeyondNewtonPE.pdf>

<http://home.epix.net/hhlindner/Writings/Space/Physics.html>

<http://henrylindner.net/Writings/PhysessImplications.pdf>

Furthermore, this author gives permission for anyone to use and publish this book in any manner that he or she so chooses, even for profit, with the exception of any figure labeled as copyrighted/fair use or any quotation. What is more, at least for now, this author also wishes to remain anonymous. There are minor reasons, such as resistance from mainstream physicists to new ideas from a novice, who is not part of their hierarchy, resistance from industry related to new inventions that destroy profits, resistance from the military in order to sequester for advantage, and finally, and most importantly, resistance from the true hidden deep state governments in order to maintain the central control mechanisms over their populations.

But the major reason for remaining anonymous is encoded in the letters as follows (A g f t L. U i i p f m, a o m)—as for now, this encrypted message will remain concealed until, moreover, if this book's theories ever come to light. If true, compared to what these initials represent, then all that lies herein within this book then shrinks to insignificance.

Now, presuming the theories presented in this article are valid, furthermore, derived inventions come to fruition, then in the author's opinion, this will result in a paradigm shift relative to all of human history. But as always with great change, there is enormous conflict as diverse factions vie to keep or obtain new wealth and power. And so, before the dawn of a new era, comes the night.

And finally, everything originates from the ether, except the ether itself. Given that, then consider this. If the concepts presented in this book are correct, what is more, ideas by which the average individual can comprehend, then perhaps, it is the Lord's plan that not just a select few, rather the vast majority of us, his children, know, understand, and appreciate **The Ether**.

By Anonymous (Ramsey) and edited by Rowena Stevens. This book is dedicated to, inspired by, and abetted by the Lord/Creator.

The author expresses grateful appreciation to Rowena Stevens and Robert de Hilster for editing this book. The author also appreciates the input/involvement of Cynthia Whitney PhD, Deiter Brill PhD, Greg Volk PhD, Phillip Mann PhD, Henry Linder, David de Hilster, Laura Orsini, and David Pepion.

Appendices

APPENDIX Introduction

The following appendices are clarifications or quotations by others regarding the concepts presented in this book. They are referred to within the publication at specific points where the ideas presented are complex and somewhat difficult to understand. Fundamentally, these additions are further explanations written mainly for the novice. Some of them were written by the author at different times, so there is considerable redundancy and some contradictions.

APPENDIX A

SRT

The following is from <http://www.dummies.com/how-to/content/einsteins-special-relativity.html>

"In 1905, Albert Einstein published the theory of special relativity which explains how to interpret motion between different inertial frames of reference—that is, places that are moving at constant speeds relative to each other.

"Einstein explained that when two objects are moving at a constant speed, what is important is the relative motion of the two objects, instead of appealing to the ether as an absolute frame of reference that defined what was going on. If you and some astronaut, Amber, are moving in different spaceships and want to compare your observations, all that matters is how fast you and Amber are moving with respect to each other.

"Special relativity includes only the special case (hence the name) where the motion is uniform. The motion it explains is only if you're traveling in a straight line at a constant speed. As soon as you accelerate or curve—or do anything that changes the nature of the motion in any way—special relativity ceases to apply. That's where Einstein's General Theory of Relativity comes in, because it can explain the general case of any sort of motion.

"Einstein's theory was based on two key principles:

- "The principle of relativity: The laws of physics don't change, even for objects moving in different inertial (constant speed) frames of reference.

- "The principle of the speed of light: The speed of light is the same for all observers, regardless of their motion relative to the light source. (Physicists write this speed using the symbol c .)

"The genius of Einstein's discoveries is that he looked at the experiments and assumed the findings were true. This was the exact opposite of what other physicists seemed to be doing. Instead of assuming the theory was correct and that the experiments failed, he assumed that the experiments were correct, and the theory had failed.

"In the latter part of the 19th century, physicists were searching for the mysterious thing called ether—the medium they believed existed for light waves to wave through. The belief in ether had caused a mess of things in Einstein's view by introducing a medium that caused certain laws of physics to work differently depending on how the observer moved relative to the ether. Einstein just removed the ether

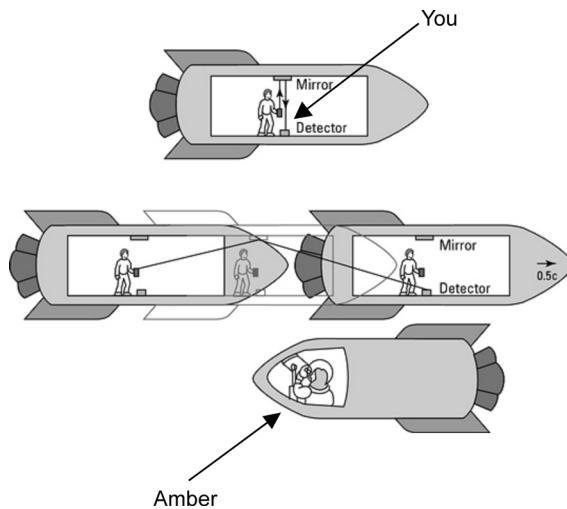
entirely and assumed that the laws of physics, including the speed of light, worked the same regardless of how you were moving—exactly as experiments and mathematics showed them to be!”

Unifying space and time

”Einstein’s theory of special relativity created a fundamental link between space and time. The universe can be viewed as having three space dimensions—up/down, left/right, forward/backward, and one-time dimension. This four-dimensional space is referred to as the space-time continuum.

”If you move fast enough through space, the observations that you make about space and time differ somewhat from the observations of other people, who are moving at different speeds.

”You can picture this for yourself by understanding the thought experiment depicted in this figure. Imagine that you’re on a spaceship and holding a laser so it shoots a beam of light directly up, striking a mirror you’ve placed on the ceiling. The light beam then comes back down and strikes a detector.



<http://www.dummies.com/how-to/content/einsteins-special-relativity.htm/>

Daniel Robbins

Figure A.1 Observers See Laser Beam Differently [Fair Use]

From Andrew Zimmerman Jones and Daniel Robbins, authors of String Theory for Dummies):

”(Top) You see a beam of light go up, bounce off the mirror, and come straight down. (Bottom) Astronaut Amber sees the beam travel along a diagonal path.

”However, the spaceship is traveling at a constant speed of half the speed of light ($0.5c$, as physicists would write it). According to Einstein, this makes no difference to you—you can’t even tell that you’re moving. However, if Astronaut Amber were spying on you, as in the bottom of the figure, it would be a different story.

”Amber would see your beam of light travel upward along a diagonal path, strike the mirror, and then travel downward along a diagonal path before striking the detector. In other words, you and Amber would see different paths for the light and, more importantly, those paths aren’t even the same length. This means that the time the beam takes to go from the laser to the mirror to the detector must also be different for you and Amber so that you both agree on the speed of light.”

(If the speed of light is c for both observers, then time and distance must differ with respect to you and Amber in order to maintain the speed of light at c . ($c = \text{distance}/\text{time}$. So, if c remains constant, then distance/time must change proportionally.)

"This phenomenon is known as time dilation, where the time on a ship moving very quickly appears to pass slower than on Earth.

"As strange as it seems, this example (and many others) demonstrates that in Einstein's theory of relativity, space and time are intimately linked together. If you apply Lorentz transformation equations, they work out so that the speed of light is perfectly consistent for both observers.

"This strange behavior of space and time is only evident when you're traveling close to the speed of light, so no one had ever observed it before. Experiments carried out since Einstein's discovery have confirmed that it's true—time and space are perceived differently, in precisely the way Einstein described, for objects moving near the speed of light.

Unifying mass and energy

"The most famous work of Einstein's life also dates from 1905 (a busy year for him), when he applied the ideas of his relativity paper to come up with the equation $E = mc^2$ that represents the relationship between mass (m) and energy (E).

"In a nutshell, Einstein found that as an object approached the speed of light, c, the mass of the object increased. The object goes faster, but it also gets heavier. If it were able to move at c, the object's mass and energy would both be infinite. A heavier object is harder to speed up, so it's impossible to ever actually get the particle up to a speed of c.

"Until Einstein, the concepts of mass and energy were viewed as separate. He proved that the principles of conservation of mass and conservation of energy are part of the same larger, unified principle, conservation of mass-energy. Matter can be turned into energy and vice versa, energy can be turned into matter, because a fundamental connection exists between the two types of substance."

From Andrew Zimmerman Jones and Daniel Robbins, authors of String Theory for Dummies):
Again, the above excerpts are taken from the website just listed, except for the statement in bold parenthesis, which is written by the author.

Einstein's argument is logical, based upon the above key presuppositions, that the speed of light is (c) relative to observer regardless of his/her rate of inertial motion and Newtonian/Galilean physics is correct (an amalgamation of Newton and Maxwell, siding more towards Maxwell = SRT). On the other hand, it is not consistent with common-sense reality, such as the twin-paradox dilemma and the quandary of simultaneity. As above again, one key underlying principle is that the speed of light is (c) relative to the observer (c in empty space regardless of the observer's inertial velocity), so there is no ether validated by the MMX.

If it can be demonstrated, as shown within this publication, that the MMX's null result is also consistent with the ether's existence, therefore, silent as to whether or not it exists, then SRT falls apart.

The first prediction: the speed of light and the demise of Newton's mechanics

The following is from http://physics.ucr.edu/~wudka/Physics7/Notes_www/node74.html

"Now that we have stated the principle of relativity, we can examine its implications, and almost immediately we find reason to worry.

"Maxwell's equations, the equations of electromagnetism, contain a quantity we called c, the speed of light, which is given without reference to any inertial observer. So, if we accept the principle of relativity and trust Maxwell's equations, we must conclude that c is the same for all inertial observers. So, if Jack measures the speed of a beam of light while sitting at the top of the hill, and Jill also measures the speed of the same beam of light while running up the hill, they should get exactly the same answer, no matter how fast Jill runs. It is often said that Einstein 'proved that everything is relative' but, in fact, his first conclusion was that the speed of light is absolute.

"This property of light is very different from, say, the properties of peas as described by the mechanics of Newton: if a person rides on a scooter and shoots peas, these move faster than the peas shot by a person standing by (Figure A.2 top). In contrast, if the person on the scooter turns on a laser and the person standing by does the same when they coincide on the street, these two laser beams will reach Pluto at the same time (Figure A.2 bottom). This happens even if the scooter moves at 99% of the speed of light.

"The pea shot from the scooter moves faster, yet both laser beams get to Pluto at the same time."

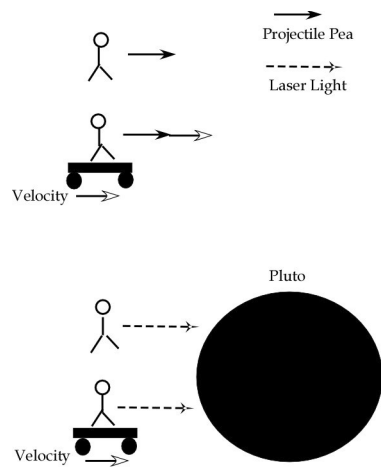


Figure A.2 Laser Light Hits Pluto at the Same Time

"Newton would be horrified by this behavior of light beams, according to his mechanics velocities so that the laser beam from the scooter should reach Pluto sooner.

"Thus, once Einstein adopted his principle of relativity, he was faced with a choice: either dismiss Newtonian mechanics or dismiss Maxwell's equations. It was impossible for them both to be right. Newton's mechanics had survived for about 250 years, it was universally accepted in the physics community, and its predictions agreed with all experiments (done up to 1905). Maxwell's equations, in contrast, were rather new, were not tested as thoroughly as Newton's, and were not universally accepted.

"Nonetheless Einstein took the daring path of siding with Maxwell and so challenged the whole edifice of the Newtonian theory. He was right.

"Having chosen sides, Einstein assumed that Newton's mechanics were not a good description of Nature under all circumstances; it must then be only a good approximation. Einstein's work was then cut out for him: he needed to find a generalization of Newton's mechanics which is consistent with the principle of relativity, and which agrees with experiments, as well as (or better than) Newton's theory. He was successful.

"Significant discrepancies between Newton's and Einstein's mechanics become noticeable only at speeds close to (c) which explains why no problems were detected with Newton's theory before 1905; all experiments were done at speeds very small compared to c . In this century, a wealth of experimental evidence has been gathered which supports Einstein's mechanics in favor of Newton's. The best examples appear in experiments done since the 1950s using subatomic particles, which are relatively easily accelerated to speeds approaching c . The behavior of such experiments completely vindicates Einstein's approach while being inexplicable from the Newtonian viewpoint.

"In conclusion, the principle of relativity, together with Maxwell's equations, imply that there is a universal speed whose value is the same to all inertial observers. This fact required several fundamental changes in the manner we understand the world."

APPENDIX B

GRT

Einstein's Special Relativity Theory (SRT) applies to only inertial linear motion, with these two basic principles. #1 and #2 are from Andrew Zimmerman Jones and Daniel Robbins authors of *String Theory for Dummies*.

1. "The principle of relativity: The laws of physics don't change, even for objects moving in different inertial (constant speed) frames of reference.

2. "The principle of the speed of light: The speed of light is the same for all observers, regardless of their motion relative to the light source. (Physicists write this speed using the symbol c .)"

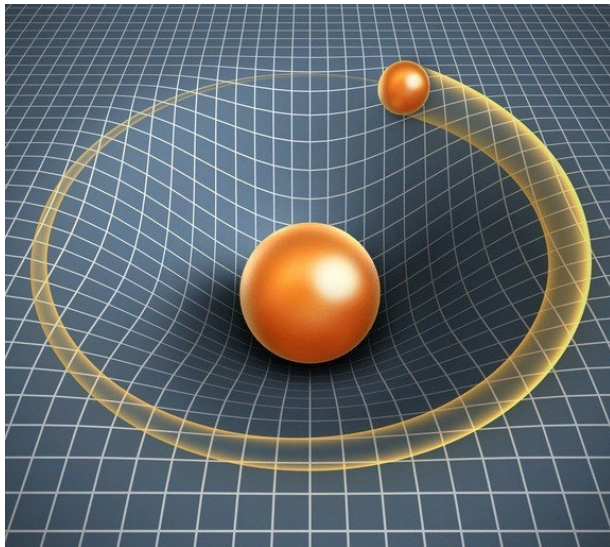
However, SRT does not account for accelerated motion. As a result, Einstein added these postulates to SRT as listed below.

#3 and #4 are from <http://physics.info/general-relativity/>

3. "The absence of a gravitational field (true weightlessness) is indistinguishable from free fall acceleration in a gravitational field (apparent weightlessness).

4. "Accelerated motion in the absence of a gravitational field is indistinguishable from un-accelerated motion in the presence of a gravitational field. The local effects of gravity are the same as those of being in an accelerating reference frame."

In doing so, Einstein created The Theory of General Relativity (GRT). GRT is a mathematical theory, what is more, very difficult to illustrate regarding two/three-dimensions relative to four-dimensional space-time. Given below are four excerpts and illustrations, none of which adequately pictures or depicts four-dimensional space-time in terms of two/three-dimensional space. Consequently, GRT is very difficult to visualize.



CC Licensed

Figure B.1 Sun Curves Space-time [Fair Use]

<https://einstein.stanford.edu/SPACETIME/spacetime2.html>

Albert Einstein proposed that matter curves space-time and that gravity is the curve that causes objects to deviate from traveling a straight line. The distortion causes the objects that were moving along a flat plane to fall into a spherical path.

Below is an excerpt from <http://www.livescience.com/37115-what-is-gravity.html>

"Einstein eventually identified the property of space-time, which is responsible for gravity as its curvature. Space and time in Einstein's universe are no longer flat (as implicitly assumed by Newton) but can be pushed and pulled, stretched, and warped by matter. Gravity feels strongest where space-time is most curved, and it vanishes where space-time is flat. This is the core of Einstein's Theory of General Relativity, which is often summed up in words as follows: **'matter tells space-time how to curve, and curved space-time tells matter how to move.'**

"A standard way to illustrate this idea is to place a bowling ball (representing a massive object such as the Sun) onto a stretched rubber sheet (representing space-time). If a marble is placed onto the rubber sheet, it will roll toward the bowling ball, and may even be put into 'orbit' around the bowling ball. This occurs, not because the smaller mass is 'attracted' by a force emanating from the larger one, but because it is traveling along a surface, which has been deformed by the presence of the larger mass.

"In the same way, gravitation in Einstein's theory arises not as a force propagating through space-time but rather as a feature of space-time itself. According to Einstein, your weight on Earth is due to the fact that your body is traveling through warped space-time!"

Below is an excerpt from <http://www.newscientist.com/special/instant-expert-general-relativity>

"Albert Einstein's General Theory of Relativity is one of the towering achievements of 20th-century physics. Published in 1916, it explains that what we perceive as the force of gravity in fact arises from the curvature of space and time. Einstein proposed that objects such as the Sun and the Earth change this geometry.

"In the presence of matter and energy it can evolve, stretch and warp, forming ridges, mountains and valleys that cause bodies moving through it to zigzag and curve. So although Earth appears to be pulled

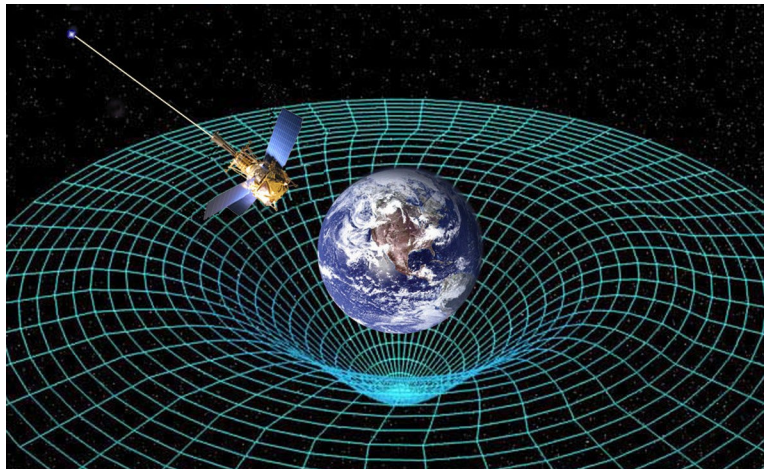
towards the Sun by gravity, there is no such force. It is simply the geometry of space-time around the Sun telling Earth how to move.”

Below is an excerpt from <https://www.space.com/17661-theory-general-relativity.html>

”In 1905, Albert Einstein determined that the laws of physics are the same for all non-accelerating observers, and that the speed of light in a vacuum was independent of the motion of all observers. This was the theory of special relativity. It introduced a new framework for all of physics and proposed new concepts of space and time. Einstein then spent ten years trying to include acceleration in the theory and published his Theory of General Relativity in 1915. In it, he determined that massive objects cause a distortion in space-time, which is felt as gravity.”

The tug of gravity

”Two objects exert a force of attraction on one another known as ‘gravity.’ Even as the center of the Earth is pulling you toward it (keeping you firmly lodged on the ground), your center of mass is pulling back at the Earth, albeit with much less force. Sir Isaac Newton quantified the gravity between two objects when he formulated his three laws of motion. Yet Newton’s laws assume that gravity is an innate force of an object that can act over a distance. Albert Einstein, in his theory of special relativity, determined that the laws of physics are the same for all non-accelerating observers, and he showed that the speed of light within a vacuum is the same no matter the speed at which an observer travels. As a result, he found that space and time were interwoven into a single continuum known as space-time. Events that occur at the same time for one observer could occur at different times for another. As he worked out the equations for his General Theory of Relativity, Einstein realized that massive objects caused a distortion in space-time. Imagine setting a large body in the center of a trampoline. The body would press down into the fabric, causing it to dimple. A marble rolled around the edge would spiral inward toward the body, pulled in much the same way that the gravity of a planet pulls at rocks in space.”



NASA

Figure B.2 Four-dimensional Space-time [Fair Use]

An example of four-dimensional space-time depicted in three dimensions.

The Principles of General Relativity

Below is an excerpt from <http://www.rafimoor.com/english/GRE1.htm#Background>

Background

”Once, when Einstein was preparing for a review of his (not yet called special) theory of relativity, he thought about the fact that a man falling from the roof of a building doesn’t feel his own weight. This thought which he later described as ‘The happiest thought of my life,’ was the seed from which the theory

of General Relativity grew. The idea of general relativity is not very hard to understand. The mathematics of it is quite complicated and involves curved space geometry that is not easy to comprehend. Einstein had struggled with the mathematics of his theory for several years before he got to the correct version of his famous field equation. Though it looks quite simple, this equation actually includes ten different differential equations, and cannot be used in practice as it is. Einstein did not expect exact solutions for his equation to come soon. Surprisingly, the first solution for the equation was found by Karl Schwarzschild a few months after Einstein published his final version of the General Theory of Relativity in 1915. This solution describes the gravity field around a massive static spherical body. No other solutions were found until the sixties when new mathematical tools were developed and computers became available.”

APPENDIX C

RELATIVISTIC MASS AND MAGNETIC FIELDS

Below is an excerpt from <http://www.newtonphysics.on.ca/magnetic/>

”Relativity theory gives a relationship predicting the increase of mass of relativistic moving particles, but no physical model has been given to describe the fundamental physical mechanism responsible for the formation of that additional mass. We show here that this additional kinetic mass is explained by a well-known mechanism involving electromagnetic energy. This is demonstrated taking into account the magnetic field generated by a moving electric charge, calculated using the Biot-Savart equation. **We show that the mass of the energy of the induced magnetic field of a moving electron is always identical to the relativistic mass $M_0(g-1)$ deduced in Einstein’s relativity.** Therefore, the relativistic parameter g can be calculated using electromagnetic theory. Also, we explain that in order to satisfy the equations of electromagnetic theory and the principle of energy and momentum conservation, toroidal vortices must be formed in the electric field of an accelerated electron.

”Those vortices are also simultaneously compatible with the magnetic field of the Lorentz force and the well-known de Broglie wave equation. This leads to a physical description of the internal structure of the electron in motion, which is at the same time compatible with the Coulomb field, the de Broglie wavelength equation, mass-energy conservation, and with the magnetic field predicted by electromagnetic theory. That realistic description is in complete agreement with all physical data and conventional logic. The paper concludes with an application, which is a first classical model of the photon, fully compatible with physical reality, without the conflicting dualistic wave-particle hypothesis.”

Fundamental Nature of Relativistic Mass and Magnetic Fields–Paul Marmet.

APPENDIX D

MMX

The Earth-Centered Nonrotating Inertial Frame and the Michelson-Morley Experiment

Appendix D posits that the Earth's gravitation field/Earth-centered nonrotating inertial frame/inflow of space is the local preferred frame for the speed of light on Earth's surface, and that the speed of light within this frame is c .

The original Michelson-Morley experiment (MMX) searched for an ether wind equivalent to the Earth's orbital velocity around the Sun, (63,000 mph) but not the Earth's rotating axial spin velocity (max 1,000 mph). As a result, the original MMX was either not sensitive enough to identify this axial spin velocity, or else it was inherently incapable of detecting the ether wind. Appendix D is meant to explain the function of the original MMX or how it is presumed to work, assuming a true ether wind. →This appendix only explains the classical interpretation of the MMX←. However, this article ignores the fact that compensatory anti-symmetry/anti-asymmetry, involving the two returning light waves traveling in opposition at the location of half-silvered mirrored, where the interference pattern actually forms, then renders the MMX →relatively (but not absolutely)← silent as to whether or not the ether exists →as compared to when classically performed/interpreted←.

Introduction

This manuscript hypothesizes that the Earth-centered nonrotating inertial frame/gravitational field/inflow of space is the local preferred frame for the speed of light on Earth. Everything else depicted in this appendix derives from this basic assumption. Additionally, keep in mind that all three terms are synonymous. Furthermore, it should be noted that the term "inflow of space" is new and not generally accepted in mainstream physics. For ease of understanding, generally, although within this appendix not exclusively, the author will use the phrase "Earth-Centered Nonrotating Inertial Frame" (ECF).

The Michelson-Morley experiment does not directly measure the velocity of light; it measures interference patterns. From the reference frame of the central light-receiving detector or observer, it evaluates how two wavefronts merge and interact with one another, resulting in an interference pattern. It also measures the total number of wavelengths of light within one arm compared to the other arm. From these measurements, (time = distance) then allegedly, if a true ether wind exists, we indirectly derive the distance that the light travels through the ether with respect to each arm.

Presuming that within the ECF, the speed of light is c , then any speed-of-light experiment performed on Earth, parallel to its surface and not rotating with it, will measure the speed of light as isotropic.

In contrast, any speed-of-light experiment carried out on Earth, parallel to its surface, while rotating with it, will measure the speed of light as anisotropic. The Sagnac effect, the GPS system, time delay with geosynchronous satellites, and diurnal stellar aberration can all be used to support the postulate that the Earth-centered nonrotating inertial frame/inflow of space/gravitational field is in fact the local preferred frame for the speed of light.

The Sagnac Effect

If you spin a Sagnac experiment within the ECF, it will have a rotational velocity relative to this frame. Consequently, if two light beams are sent in opposite directions around the periphery of the rotating experiment, then the distances that the beams travel through this preferred frame are asymmetrical. This produces a fringe shift for the duration of rotation. This model explains the Sagnac effect and is consistent with the postulate that the ECF/gravitational field/inflow of space is the local rest frame for the speed of light.

The GPS System

With respect to the mathematical calculations of the GPS system, to find the exact location for an object placed on the rotating surface of the Earth, one must include both the object's velocity at its latitude relative to the ECF as well as the orbital velocities of the GPS satellites, again relative to ECF. Recognize this explanation (c) is not relative to the observer but rather **ONLY** the ECF (nonrotating gravitational field). This outcome is irreconcilable with Einstein's SRT, whereby the speed of light is relative to **only** the observer (c constant in empty space regardless of the observer's inertial motion). In effect, the GPS system presumes the speed of light (c), as well as the synchronization of the atomic clocks, are relative to **only** the ECF. Otherwise, the system will not function accurately. Once again, this observation is consistent with, and perhaps proof that, the Earth-centered nonrotating inertial frame is the local rest frame for the speed of light.

Time Delay with Geosynchronous Satellites

Scientists have observed that the amount of time (speed of light) it takes for radio waves to travel from Japan to the United States via a geosynchronous satellite is greater than those waves transmitted in the reverse direction. The difference corresponds to the Earth's rotational spin velocity at the latitude of the experiment. Yet again, this experiment is consistent with the postulate that the ECF/gravitational field/inflow of space is the local rest frame for the speed of light.

Annular and Diurnal Stellar Aberration

<http://www.americanantigravity.com/>

"If you watch the stars (using the necessary equipment) over the course of a year, you'll note that they move about in little ellipses. The paths of the stars over the poles (or more precisely, above the plane of the Earth's orbit) will be almost circular, while the paths of those near the equator will be flat. This effect is called **annular** stellar aberration. Unlike parallax, this affects all stars equally, no matter what their distance.

"You'll note that annular stellar aberration affects all stars, so this effect is different from parallax. Since it equally affects stars that are at any distance from the solar system, and since the effect varies with a star's distance from the Earth's orbital plane (an imaginary plane that intersects with the Earth's orbit), then we know that this effect is somehow due to the Earth's motion as it goes around the Sun each year.

"Annular stellar aberration is the effect well-known by astronomers to cause stars to shift 20.5 arc seconds in their location in the sky. The amount of apparent positional change is governed by the time of year and location in the sky with regard to the Earth's orbit around the Sun. The number also mathematically correlates perfectly with the Earth's speed around the Sun compared to the speed of light.

"If you understand relativity, you should have immediately picked up that light between an emitter and an observer should have no relation with some third object. Yet we find annular stellar aberration is perfectly related to a third object: Our speed with respect to the Sun. They have picked the Sun as the center of a preferential reference frame and have no idea why they did it." (website anti-relativity - no author)

In the same way, the Earth is also the center of a preferred reference frame for the speed of light. It fixes the speed of light relative to a nonrotating Earth. This is defined as the Earth-centered inertial nonrotating frame/Earth's gravitational field. For ease of comprehension and visualization, this can also be recognized as the inflowing-space model. The essence of this model is this: the nonrotating inflow of space is towards Earth. Essentially, the Earth captures, holds onto, and drags its surrounding ether as it pulls space into itself (a form of entrainment). As a result, it fixes the direction of the starlight relative to the nonrotating Earth (preferred frame). Accordingly, any speed-of-light experiment performed on the Earth's surface, perpendicular to the inflow of space, and not revolving with the Earth, will observe the speed of light as isotropic.

Therefore, starlight viewed from an observer rotating with the surface of the Earth will exhibit **diurnal** stellar aberration akin to **annular** stellar aberration. This is because the starlight's direction is fixed within the Earth-centered fixed frame. The observer, who is rotating on the surface of the Earth, also within this fixed frame, then possesses a cyclical changing velocity and angle relative to the direction of that starlight. For that reason, he/she will observe diurnal stellar aberration.

→It is important to note that annular stellar aberration can be explained if one assumes that the Sun's gravitational field fixes the velocity of light relative to itself, while diurnal stellar aberration can be explained if one presumes that the Earth's gravitational field fixes the velocity of light relative to itself←. Both annular and diurnal stellar aberrations mandate a preferred frame. Once more, diurnal stellar aberration is consistent with the postulate that the Earth-centered nonrotating inertial frame (inflow of space) is the local rest frame for the speed of light.

Definitions and Assumptions

Assume a theoretical MMX is carried out at the Earth’s equator, initially with one arm oriented eastwards in the direction of the Earth’s rotational spin, while the other arm is oriented northwards, perpendicular to the Earth’s rotational spin. Imagine that this experiment is placed within three separate reference frames as portrayed below (Figure D.1).

- The Earth-centered nonrotating inertial frame is the local rest frame for the speed of light on Earth (zero mph relative to the ECF).
- Coordinate System A is located at the Earth’s equator, moreover, at rest with the Earth’s rotating surface (1,000 mph relative to the ECF).
- Coordinate System B is located at the Earth’s equator, furthermore, aboard an airplane traveling eastward at 600 mph. (1,000 mph from Earth’s rotation + 600 mph from the plane = 1,600 mph relative to the ECF).

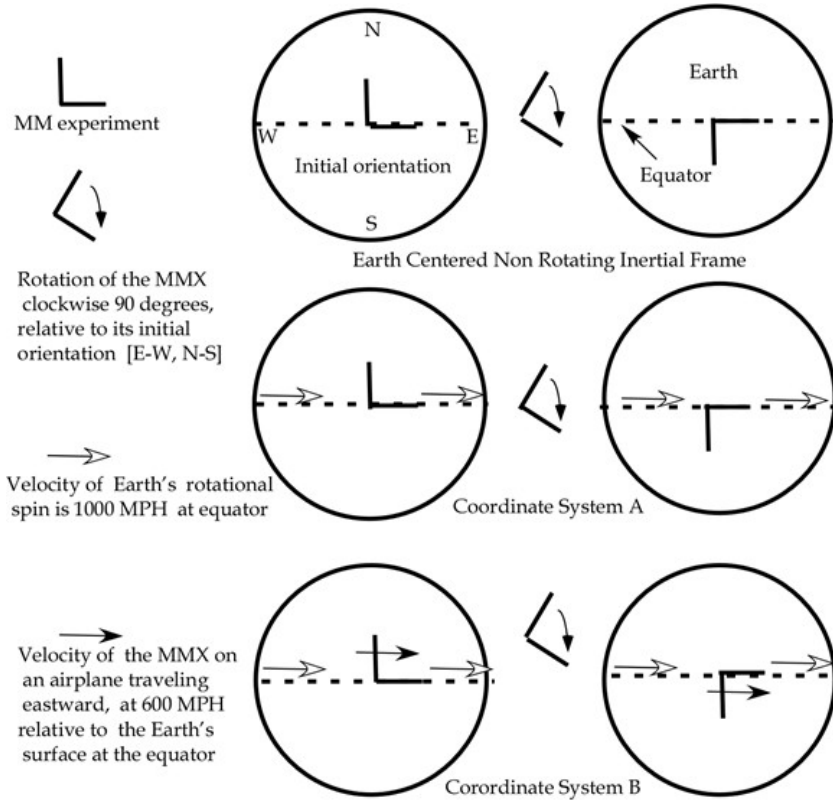


Figure D.1 Three Separate Reference Frames

Arms initially oriented east-west and north-south and then rotated clockwise.

Top. Earth-centered nonrotating inertial frame (the ether) is the rest frame for the speed of light. MMX is located at the equator, furthermore, at rest with the ether (ECF).

Middle. Coordinate System A = MMX located at the equator, moreover, in synchrony with the Earth’s rotating surface. As a result, the MMX possesses an eastward velocity of 1,000 mph relative to the ether.

Bottom. Coordinate System B = MMX located at the equator aboard an airplane traveling eastward at 600 mph with respect to the rotating surface of the Earth. Therefore, the MMX possess a velocity of 1,600 mph relative to the ether (600 mph + 1,000 mph).

Method for the Explanation of the New Theory

1. Review of the classical interpretation of the MMX.
2. The MMX described as a function of the ECF (Earth's gravitational field), furthermore, the rationale for why the experimental findings are null.
3. Discussion of the Kennedy Thorndike Experiment (KTX).

Classical Interpretation of the MMX

Listed below is the classical interpretation of the MMX by Michael Fowler, Ph.D. (notations in brackets are the author's.)

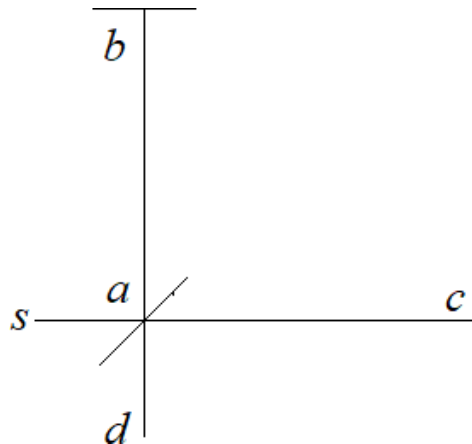


Figure D.2 Classical Interpretation [Fair Use]

The source of light is at s, the 45-degree line is the half-silvered mirror, b and c are mirrors, and d is the observer.

The horizontal axis is west-east and east-west; the vertical axis is south-north and north-south; speed = 1,000 mph relative to the ether (Earth-centered nonrotating inertial frame). (From the Michelson-Morley article in the American Journal of Science No. 203. November 1887)

1. "The scheme of the experiment is as follows: a pulse of light is directed at an angle of 45 degrees at a half-silvered, half-transparent mirror, so that half the pulse goes on through the glass, half is reflected. They both go on to distant mirrors, which reflect them back to the half-silvered mirror. At this point, they are again half-reflected and half-transmitted, but a telescope is placed behind the half-silvered mirror (as shown in the Figure D.2) so that half of each half-pulse will arrive in this telescope. Now, if there is an aether wind blowing, someone looking through the telescope should see the halves of the two half-pulses to arrive at slightly different times, since one would have gone more upstream (west-east) and back, one more cross stream (south-north) and back." (The wave from west-east and back would travel a longer distance (time) than the wave from south-north and back). "To maximize the effect, the whole apparatus, including the distant mirrors, was placed on a large turntable so it could be swung around."

2. "Michelson sent in (utilized) a steady beam of light of a single color. This can be visualized as a sequence of ingoing waves, with a wavelength one fifty-thousandth of an inch or so. This sequence of waves is split into two and reflected back as previously described. One set of waves goes upstream and back (northward and then southward (a, b then b, a). The other set of waves goes cross-stream and back (eastward and then westward (a, c then c, a).

"Finally, they come together into the telescope and the eye (d). If the one that took longer is half a wavelength behind, then its troughs will be on top of the crests of the first wave; thus they will cancel, and nothing will be seen. If the delay is less than that, then there will still be some dimming.

”However, slight errors in the placement of the mirrors would have the same effect. This is one reason why the apparatus is built to be rotated. On turning it through 90 degrees, then the upstream, downstream, and the cross-stream waves exchange places (east-west waves through the ether wind and the north-south waves through the ether wind). Now the other one should be behind. Thus, if there is an aether wind, if you watch through the telescope while you rotate the turntable, you should expect to see variations in the brightness of the incoming light.”

Assume the existence of the ether wind relative to Coordinate System A and **presume identical physical length of the arms**. Accordingly, after 90 degrees of rotation, the east-west arm and the north-south arm will have, in effect, exchanged places. As a consequence, these two interference patterns, separated by 90-degrees of rotation, are symmetrical mirror images of one another, and as such, are identical, although still mirror images. Assuming the reality of the ether, presuming the experiment is performed at a velocity relative to the ether. Presuming Michael Fowler’s traditional representation is accurate, then during rotation it will be impossible for one not to identify a variation in intensity, as the two interference patterns trade places with one another.

To clarify this model, picture in your mind two overlapping, vertically oriented metal grates that are not completely superimposed upon one another. Now imagine they subsequently exchange places. In order to accomplish this exchange, they will have to move in opposite directions (e.g., one will move to the left while the other will move to the right). Therefore, before the exchange is complete, they will superimpose.

If the metal grates →are somewhat analogous← to light waves, as described in the classical MMX, then during rotation, the two grates will continually move back and forth relative to each other in 90-degree intervals throughout 360 degrees. Similarly, during rotation—with respect to the classical MMX interpretation, at the position of the interference pattern—there will be a continuous back-and-forth shifting of the east-west wave relative to the north-south wave. This process produces a continually changing alternating interference pattern, somewhat analogous to the metal grate illustration. What’s more, this function is the result of the relative changing distances of light traveling through the ether (time) within the two arms, which occurs during rotation. See the Michelson-Morley original article, *The American Journal of Science* No. 203. November 1887, page 340, as illustrated below.

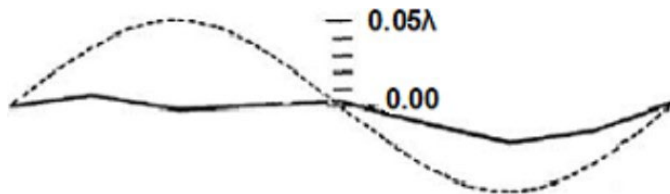


Figure D.3 Graph of the Expected Theoretical Displacement [Fair Use]

This illustration is found in the original Michelson-Morley article in the American Journal of Science No. 203. November 1887.

Figure D.3 illustrates, presuming the existence of the ether wind, a graph of the expected theoretical displacement of the interference patterns throughout 360 degrees of rotation, which is represented by the larger sinusoidal dotted line. In future discussions, this graph will be defined as the **sinusoidal-shaped curve pattern**.

This sinusoidal-shaped curve pattern, if observed, is the evidence of the ether wind. Alternatively, relative to the ECF, a single interference pattern as a function of only one direction is not proof, because a single interference pattern could be related to just unequal physical length of the arms. The sinusoidal-shaped curve pattern is only observed during rotation, in the presence of the ether wind. However, this sinusoidal pattern has never been detected. What physicists have found is a constant unchanging interference pattern, incompatible with the ether wind, though consistent with the no-ether theory.

Rotation of the MMX

Assume Coordinate System A in the initial N-S and E-W orientation (Figure D.4). For the initial 90 degrees of rotation, the sum of the continuous increase in the number of wavelengths (distance) within one arm is equal to the sum of the continuous decrease in the number of wavelengths within the other arm. However, one must keep in mind that the anti-symmetry in the subsequent 90 degrees of rotation reverses the changes in the first 90 degrees of rotation. This reversing anti-symmetrical process repeats itself in 90-degree intervals throughout 360 degrees at which time the experiment is then at its original position. For simplicity, within this article, the author will only describe the anti-symmetry of the first 90 degrees of rotation.

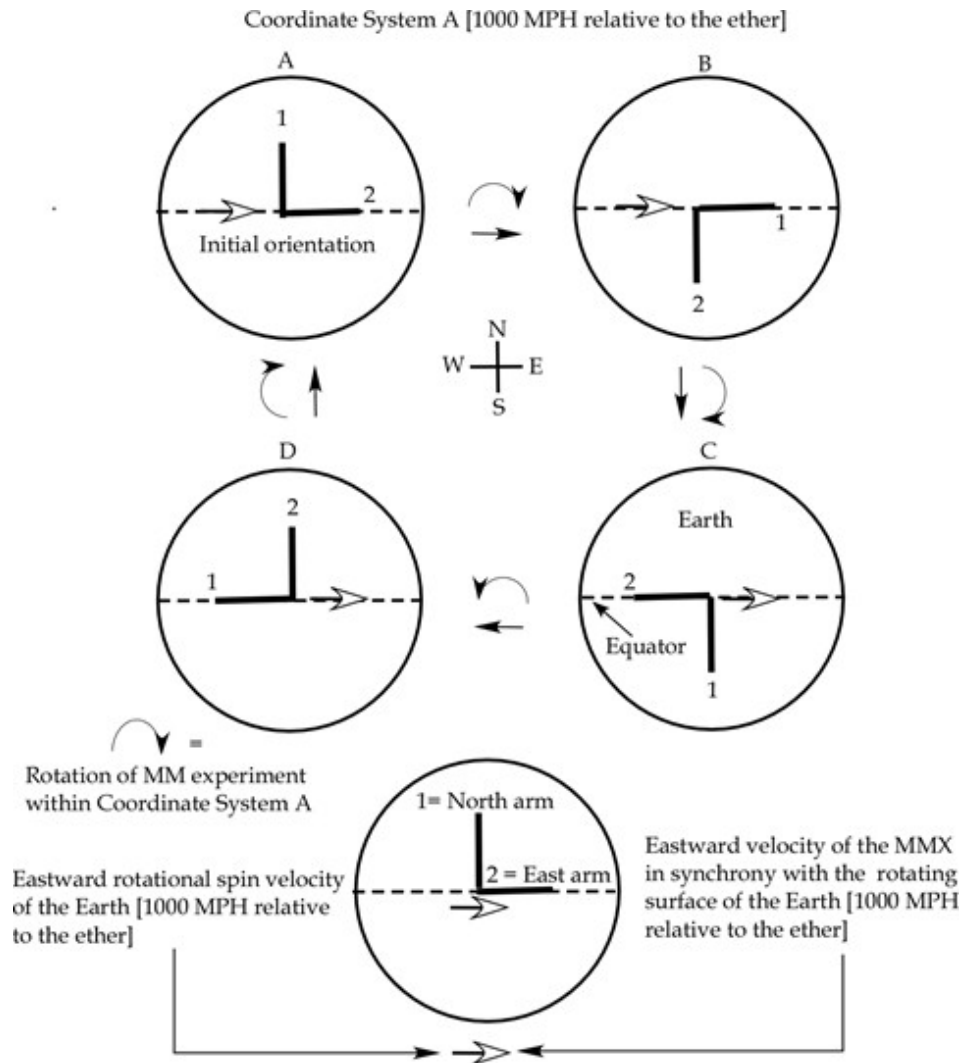


Figure D.4 Coordinate System A

Initial orientation is (E-W and N-S) relative to the ether. Therefore, the total number of wavelengths within arm 2 is greater than within arm 1.

- *A to B—symmetrical gain of wavelengths of 1 versus the loss of wavelengths of 2 (summed over 90 degrees).*
 - *B to C—symmetrical loss of wavelengths of 1 versus gain of wavelengths of 2 (summed over 90 degrees).*
 - *C to D—symmetrical gain of wavelengths of 1 versus loss of wavelengths of 2 (summed over 90 degrees).*
 - *D to A—symmetrical loss of wavelengths of 1 versus gain of wavelengths of 2 (summed over 90 degrees).*
-

Mirrors

Each reflection from a mirror shifts a light wave 180 degrees out of phase with respect to the original light beam. However, from the reference frame of the interference pattern, symmetry from all of the mirrors negates any overall change.

- The beam splitter shifts the outgoing S-N wave one-half wavelength out of phase. The outgoing W-E is unaffected.
- The peripheral mirrors will shift both waves one-half wavelength out of phase.
- The beam splitter shifts the incoming E-W wave one-half wavelength out of phase. The incoming N-S wave is unaffected.

As a result, at the location of the interference pattern, each light wave will have undergone 2X (one-half wavelength) change in phase. Therefore, from the reference frame of the observer (d) there will be no change in the phase of the light waves from only the mirrors.

MMX in Earth's Gravitational Field or the ECF

The author will now describe the classical MMX with respect to the three hypothetical coordinate systems. The experiment is initially orientated (E-W and N-S) at the Earth's equator. →Furthermore, again assume equal physical arms←. (See figures D.1, D.4, and D.5.)

Earth-Centered Nonrotating Inertial Frame (The Ether)

Imagine we perform an MM experiment at the equator, moreover, at rest in the Earth-centered non-rotating inertial frame (the ether), thus not rotating with the Earth. In this frame, the total number of wavelengths within one arm is precisely equal to the total number of wavelengths within the other arm. Consequently, if you rotate this experiment, 360 degrees, there is no change of the in-phase interference pattern.

Coordinate System A

Envision that we carry out an MM experiment at the equator, what's more, at rest with the rotating surface of the Earth (Coordinate System A). Relative to the ether, the experiment possesses an eastward velocity of 1,000 mph. As a result, initially the total number of wavelengths within the east-west arm is greater than the total number of wavelengths within the north-south arm. Next, assume the apparatus is rotated 90 degrees clockwise. Accordingly, during this rotation summed over 90 degrees, the total number of wavelengths (distance) within the north-south arm exchanges places with the number total number of wavelengths within east-west arm.

Essentially, the gain in the number of wavelengths within the north-south arm is equal to the loss of number of wavelengths within the other arm. In addition, when both arms are oriented 45 degrees relative to the direction of the ether wind, then in this position, the total numbers of wavelengths (distance) within the arms are equal to each other. Notice, at this location the waveforms are in phase; however, at 0 degrees and 90 degrees they are out of phase. For that reason, if the experiment is rotated 360 degrees, the displacement pattern takes the form of a sinusoid.

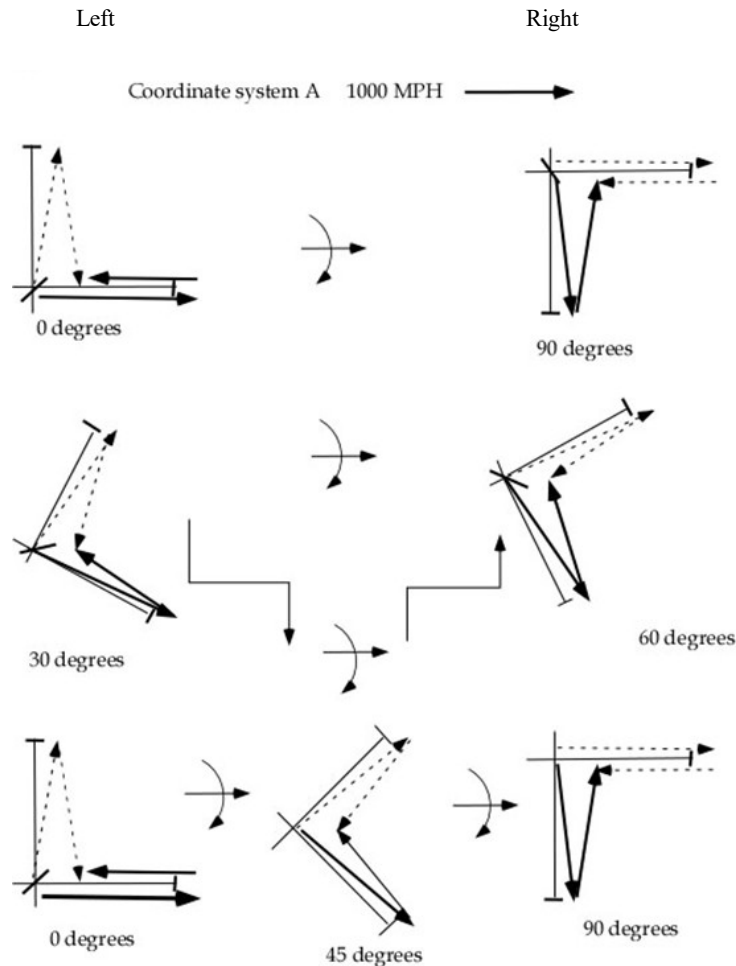


Figure D.5 Coordinate System A - Rotation from Left to Right
 During rotation from left to right (\rightarrow summed over 90 degrees \leftarrow)

1. The dotted distance exchanges places with the solid distance (\rightarrow summed over 90 degrees \leftarrow).
2. The total number of wavelengths within the dotted arm exchanges places with the total number of wavelengths within the solid arm (\rightarrow summed over 90 degrees \leftarrow).
3. The gain in the number of wavelengths within the dotted arm is symmetrical with the loss in the number of wavelengths within the solid arm (\rightarrow summed over 90 degrees \leftarrow).

Coordinate System B

Suppose that an MMX is carried out at the equator, aboard an airplane traveling eastward at 600 mph (Coordinate System B). Relative to the ether, the experiment possesses an eastward velocity of 1,600 mph (1,000 mph + 600 mph). Again, initially, the total number of wavelengths (distance) within the east-west arm is greater than the total number of wavelengths within the north-south arm. But when compared to Coordinate System A, there is now a **greater ratio** in the total number of wavelengths within the east-west arm compared to the north-south arm. Now assume the apparatus is rotated 90 degrees clockwise. During this rotation summed over 90 degrees, the total number of wavelengths within the north-south

arm exchanges places with the total number of wavelengths within the east-west arm. Or the gain in the number of wavelengths within the north-south arm is equal to the loss of number of wavelengths within the east-west arm. What is more, when both arms are oriented 45 degrees relative to the direction of the ether wind, then at this location, the total numbers of wavelengths (distance) within the arms are equal to each other. Also notice, at this position, the waveforms from the arms are in phase, yet at 0 degrees and 90 degrees, they are out of phase. As a consequence, if the experiment is rotated 360 degrees, the displacement pattern will take the form of a sinusoid.

Furthermore, this sinusoid-shaped wave pattern has a different contour compared to Coordinate System A. This is because when the MMX is positioned within Coordinate System B, there is a different ratio of the total number wavelengths within its arms compared to if located in Coordinate System A.

Within all three coordinate systems, there is either no interference pattern (ECF, equal physical arms) or a specific sinusoidal-shaped wave pattern for each frame (A different from B). The MMX and all analogous experiments have been performed at fixed latitude and in synchrony with the rotating Earth's surface. For that reason, they are at a constant rotational spin velocity with respect to ECF, making the maximum detectable anisotropy for the velocity—1,000 mph at the equator.

In addition, between different coordinate systems, there will be an asymmetrical gain in the number of wavelengths within one arm compared to the other arm.

Consequently, the appearance of the sinusoidal-shaped curved pattern would be dissimilar between frames. The following scenario will depict this concept more precisely. Envision a theoretical MMX located within the Earth-centered nonrotating inertial frame (0 mph) with its arms oriented and **fixed** in the east-west and north-south directions.

Then presume, by initiating an eastward velocity, we transport the device, without rotation, from the Earth-centered frame into Coordinate System A (1,000 mph). Following this transformation, there will be an increase in the number of wavelengths within the east-west arm, as well as the north-south arm, compared to the Earth-centered frame. Nevertheless, the increase will be greater within the east-west arm compared to the north-south arm. This asymmetrical change in the number of wavelengths within the arms, which occurs within one coordinate system versus a different coordinate system, is the explanation for the alteration in the appearance of the interference pattern between those frames.

Given these assumptions, then the experimental results of the MMX are null because:

1. The classical MMX does not have the sensitivity to detect an ether wind corresponding to the Earth's rotational spin velocity (1,000 mph or less).
2. **The MMX is inherently incapable of detecting the ether wind as classically performed/interpreted as postulated by the book titled *The Ether* (anonymous—Ramsey).**
3. The MMX, as well as some of the other analogous speed of light experiments, have only attempted to measure the Earth's orbital velocity around the Sun or else the Earth's velocity relative to the isotropy of the microwave background radiation rather than the Earth's rotational axial spin velocity.

The Kennedy-Thorndike Experiment

In reality, it is impossible to construct an MMX such that the physical lengths of the arms are perfectly equal relative to a single wavelength of light; there is always a slight physical asymmetry. In principle, it is this asymmetry that makes a Kennedy-Thorndike speed of light interferometer. With physical asymmetry, in the initial position (EW/NS—Earth-Centered Frame), the total number of wavelengths in one arm differs from the other arm. This produces a **specific** out-of-phase interference pattern. Nevertheless, within the Earth-centered, nonrotating inertial frame, if this device is rotated 360 degrees there is no fringe shift.

Imagine that this same apparatus now has a velocity with respect to the ECF (Coordinate System A), yet again, in the initial orientation. So compared to the ECF, this will change the ratio of the total number of wavelengths of light in one arm versus the other arm. In essence, there will be an asymmetrical gain in the number of wavelengths within one arm relative to the other arm, as compared to the ECF.

Therefore, if the device is rotated 360 degrees, the displacement pattern will take the form of a sinusoid. With respect to Coordinate System A, the interference pattern is a function of both the asymmetrical physical length of the arms as well as the velocity of the device relative to the ether wind, which is 1,000 mph eastward. Nevertheless, only the later process is the source for the sinusoid pattern. Therefore, the

Kennedy-Thorndike Experiment is analogous to the MMX. **What is more, the experiment outcome is null, for exactly the same reason as just described for the MMX.**

→It should be emphasized that the classic MMX is, in fact, a Kennedy-Thorndike, experiment, because in practicality the physical length of the arms is always unequal relative to a single wavelength of light. It is when the physical lengths of the arms are different enough to be noticeable, that we then define it as the Kennedy-Thorndike experiment. So, in fact, all Michelson-Morley experiments are actually Kennedy-Thorndike experiments←.

Possible Experimental Demonstration of the Ether with Respect to Two Different Reference Frames

Assume the MMX is inherently capable of detecting a true ether wind and equal physical length of the arms. Consequently, within each of the separate coordinate systems, during 360 degrees of rotation, there will be either a given sinusoidal pattern (A and B) or else no interference pattern (Earth-centered frame). However, the interference pattern will vary between coordinate systems. For instance, if we carry out a MMX on the rotating surface of the Earth and then aboard an →eastward← traveling plane at the same latitude, there will be different-shaped sinusoidal patterns between these two frames.

Alternatively, if we perform the experiments first at the equator, at rest with the rotating surface of the Earth, 1,000 mph relative to the ether and then at the South Pole, 0 mph relative to the ether, then once again, there will be a disparity in the shape of the interference patterns between these two frames. In summary, for both scenarios, there will be a transformation in the shape of the interference curve pattern between two separate coordinate systems, which, if observed, is a confirmation of the ether wind.

Conclusion

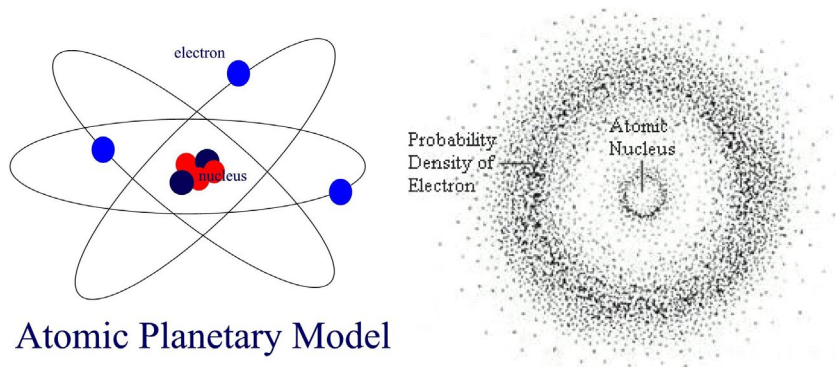
This appendix postulates that the Earth-centered nonrotating frame (gravitational field/inflow of space) is the local rest frame for the speed of light. Furthermore, it implies that →as classically performed/interpreted←, the MMX has a low sensitivity which cannot detect a 1,000 mph ether wind, causing it to consistently produce a null result. Besides this, experimenters were not even looking for the Earth's rotational spin velocity.

Alternatively, the MMX may be inherently incapable of detecting the ether wind →as classically performed/interpreted←, which is the assumption of this book titled *The Ether*. This subject matter is described in Chapter 3 of this book.

APPENDIX E

THE STRUCTURES OF THE ATOM AND ELECTROMAGNETIC RADIATION AS A FUNCTION OF THE ETHER

This new model posits that both matter and electromagnetic radiation (EMR) consist of only electric and magnetic fields. Moreover, they are both derived from and are structures of the ether. It also uses the presumption of the ether to create a modified Bohr model of the atom, analogous to QMs electron cloud model. In other words, as shown in Figure E.1, the classic Bohr Model on the left is transformed into the QM model on the right, which, in reality, is a modified Bohr model. Additionally, this appendix illustrates how this new model of the atom and EMR are both a function of the quantum nature matter and energy.



Atomic Planetary Model

Wikipedia

Figure E.1 Bohr Model and the QM Cloud Model [Fair Use]

In order to give explanation to the last postulate, this theory assumes the following six attributes.

1. Matter (electrons, protons etc.) is derived from electromagnetic radiation, which is a wave of the ether. Moreover, when given the proper circumstances, this wave instead of traversing linearly through space (ether) at c , curls and spins upon itself, thus transforming into matter (charged particles). This includes positively charged protons, as well as negatively charged electrons, which then attract one another.

2. An electron is made up from only electric and magnetic fields, again structures of the ether. In addition, neither field exists at a precise central location with respect to space. In theory, these fields could extend to infinity, although this may not, in fact, be true. Regardless, the electron's two types of fields are spread out over a volume.

3. When an electron and proton attract, due to their opposing electric fields, to form an atom, moreover orbit one another, their magnetic fields also interact in a very complex manner. Bear in mind, the magnetic fields generated by protons (quarks) are considerably weaker compared to the magnetic fields generated by electrons. Nevertheless, the equal opposing electron's spins within orbital shells generate opposite repelling/attracting magnetic fields. And the opposing proton's spins within the nucleus produce repelling/attracting magnetic fields as well. As a result, an atom consists of a complex interaction of all of its electric and magnetic fields/forces, which are in a stable state of equilibrium.

4. An electron (or electrons) does not orbit the proton (nucleus) analogous to the way a planet orbits the Sun. Instead, it orbits in a "rapid, random-like" pattern. In addition, recall as above, an electron is constructed from only electric and magnetic fields. As a result, neither field is located at a precise location with respect to space, rather only a region.

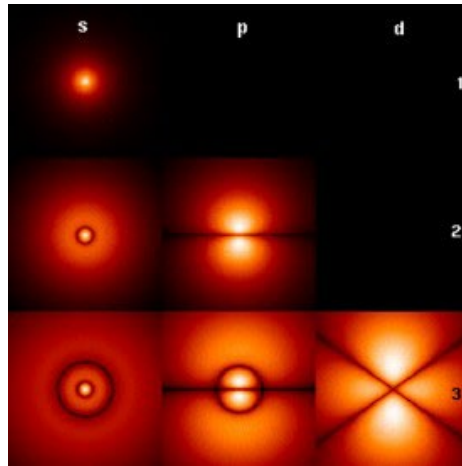
5. Given these two attributes of rapid random motion and lack of locality, then integrated over a short period of time, as an electron orbits the nucleus, it forms a cloud-like pattern, analogous to the quantum mechanics model of the atom.

6. Assuming the electron has no precise point location with respect to space (field of the ether), nor does it possess a specific orbital path, rather only rapid, random-like orbital motion, then one can only determine a probability of the electron's location, seeing as it is spread out over a region. What is more, experimentally, one can determine only a probability of its velocity (momentum), since it travels too fast to accurately measure. Namely, mathematically, one cannot simultaneously determine the exact position and the exact velocity (momentum) of the orbiting electron = QM.

By using these attributes, the classical Bohr Model transforms into the modified Bohr Model, which is analogous to the cloud model of QM. For that reason, this new model of the electron is consistent with QM. But, most importantly, it is a function of the ether.

This new theory posits that the complex interacting fields of the proton and electrons are in a stable state of equilibrium. This produces an atom, since this is what holds its constituents together. In addition,

different elements are associated with their own individual stable states. Furthermore, the stable configurations for some elements are extremely complex. Accordingly, as depicted in Figure E.2, the equilibrium points for some of the elements can form odd configurations, such as a donut or a bar bell, once again just like QM. Incidentally, the different de Broglie wavelengths of the orbiting electrons are also a part of the stable equilibrium state.



Wikipedia

Figure E.2 Equilibrium Points Show Donut or Bar Shape [Fair Use]

Fundamentally, as shown above, different elements are associated with dissimilar stable equilibrium points, which are represented by diverse configurations of their complex interacting electric and magnetic fields. Once more, this concept is consistent with QM.

In the same way, molecules, as well as other larger structures, including the magnetic domains of a permanent magnet, are also stable equilibrium points involving large numbers of atoms. This same model is applicable to protons, neutrons, and quarks. For example, each subatomic unit of the nucleus possesses its own electric field, magnetic field, as well as the strong and weak force fields. All these complex fields (forces) interact with one another to form the nucleus, again only relative to a specific equilibrium state. →This makes more sense if one assumes that the quarks orbit each other, or alternatively, the protons and neutrons orbit one another←. In effect, these stable configurations associated with different numbers of protons, neutrons, or alternatively, quarks represent the nuclei of the different elements.

However, some elements decay into other elements. So in this specific instance, the equilibrium configuration for that type of atom is not absolutely stable over time. For example, generally, the complex interacting fields produced by all the subatomic units are stable. Nevertheless, on a rare occasion, as they interact, the total configuration becomes unstable. When this occurs, a subatomic unit, a photon, or both is/are ejected from the nucleus. Simultaneously, the remaining nuclear subatomic units rearrange themselves to form new stable equilibrium configurations. Once again, this concept is consistent with QM.

The main points to take home with respect to this appendix vis-à-vis matter (particles) and energy (EMR):

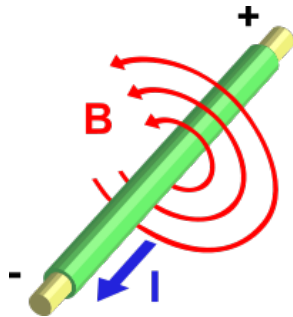
1. They are a product of the ether.
2. They are interchangeable with the ether.
3. They self-assemble to form an equilibrium, e.g., atom.
4. They produce what is perceived as quanta, because of their equilibrium states and interactions.

APPENDIX F

THE STRUCTURE AND FUNCTION OF RAIL-GUNS

There are numerous articles, which posit that the physics of railguns is consistent with Newton's third law. In contrast, other scientific papers state that the recoil of a railgun can be absent or else markedly reduced, and, as a consequence, incompatible with Newton's third law.

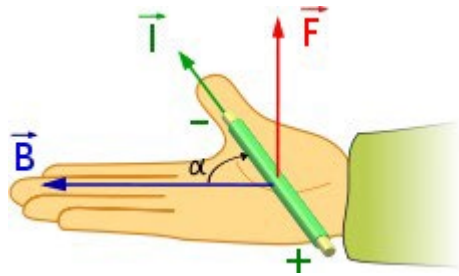
In order to comprehend the function of a railgun, knowledge of the following basic principles is paramount. First, is the production of a magnetic field by a current. And the second is the Lorentz force produced by the interaction of a current with a magnetic field. They are revealed below in figures F.1 and F.2.



Wikimedia Commons

Figure F.1 Magnetic Field Produced by + Current [Fair Use]

Current (I) through a wire produces a magnetic field (B) around the wire. The field is oriented according to the right-hand rule.



Wikimedia Commons

Figure F.2 Lorentz Force Defined by Right-Hand Rule [Fair Use]

Right-hand rule for a + current-carrying wire in a magnetic field B .

Now please refer to Figure F.3 below.

Railgun with a Breech

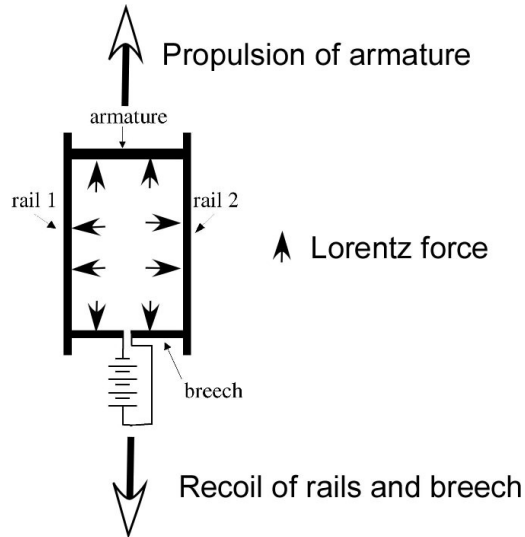


Figure F.3 Lorentz Forces Produced by Railgun

Figure F.3 depicts a closed-circuit railgun with a current. Observe the current produces a magnetic field (Figure F.1). Subsequently, the magnetic field interacts with its own induced current to produce net Lorentz forces (Figure F.2). The black arrows denoted in Figure F.3 represent the direction of Lorentz forces as a function of figures F.1 and F.2.

Regarding this model (Figure F.3) the Lorentz force exerted on the armature is equal to the Lorentz force on the breech, however, in the opposite direction. In addition, the Lorentz force directed against fixed rail 1 is equal to the Lorentz force upon fixed rail 2, again, in the opposing direction. Now, given that the rails are attached to each other, they remain immobile relative one another.

So, during the time of the current, when the armature is propelled forward, there is a reverse recoil force located at the breech which then pulls the attached rails backwards along with its own motion. The physics just described is consistent with Newton's third law. For that reason, this form of railgun, containing a closed breech, cannot be used for overall propulsion without a propellant.

Railgun Without a Breech

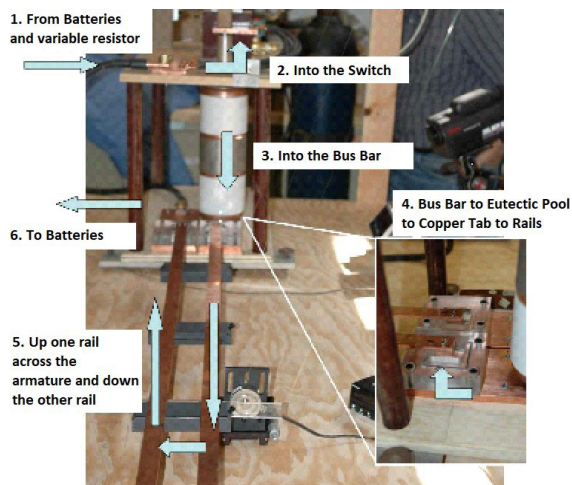
The following abstract, along with figures F.4, F.5, and F.6, is of an actual experimental device built for a master's thesis written by Mathew K. Schroeder, et al at the Naval Postgraduate School Monterey California. The thesis is titled *An Investigation of the Static Force Balance of a Model Railgun* by Matthew K. Schroeder, June 2007. That article can be found at:

<http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA473387&Location=U2&doc=Get>

Abstract of Thesis

”An interesting debate in railgun research circles is the location, magnitude, and cause of recoil forces, equal and opposite to the launched projectile. The various claims do not appear to be supported by direct experimental observation. The goal of this research publication is to develop an experiment to observe the balance of forces in a model railgun in a static state. By mechanically isolating the electrically coupled components of such a model, it has been possible to record the reaction force on the rails and compare that force with the theoretical force on a projectile. The research is ongoing, but we have observed that the magnitude of the force on the armature is at least seventy times greater than any predicted equal and opposite reaction force on the rails.”

Figure F.4 below shows a photograph of this actual device, whereas figures F.5 and F.6 are schematics.



MatthewK. Schroeder et al

Figure F.4 Photograph of a Railgun [Fair Use]

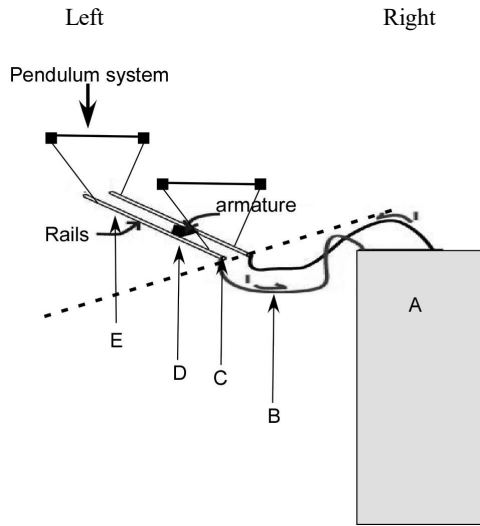
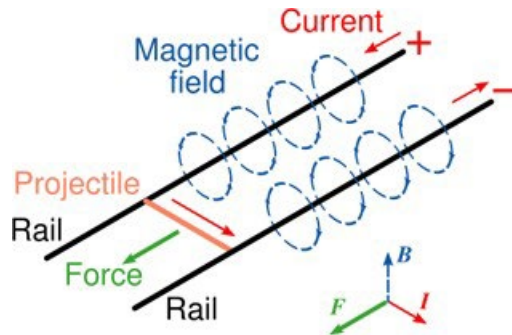


Figure F.5 Schematic of Railgun

- A = batteries, capacitors, copper wires, etc., which complete the circuit.*
- B = copper wire conductor which delivers current to the rails. Parallel wire receives current from the rails.*
- C = conductor brushes used for free-floating attachment of the copper wires to the rails.*
- D = armature*
- E = rails*



Wikipedia

Figure F.6 Schematic of Railgun with Lorentz Force [Fair Use]

The schematic as represented above is an enlargement, of Figure F.5 earlier, specifically of the region to the left of the dotted line labeled C.

Within the available literature, moreover, with reference to railgun physics, there is considerable theorizing, as well as speculation. Nevertheless, there is very little experimentation accessible for review that is not classified. Relative to railgun physics, the thesis offered above is the best article that this author has ever come across.

Again, Figure F.4 is a photograph of the experiment. Notice, the photo is complex, for that reason, difficult to decipher. Consequently, for ease of comprehension, it will be broken down into its individual components, by using schematics, as revealed in figures F.5 and F.6, above and figures F.7 and F.8, below.

Please refer to figures F.7 and F.8. The rails (E) and armature (D) are suspended with a wire system, somewhat analogous to a pendulum (SW).

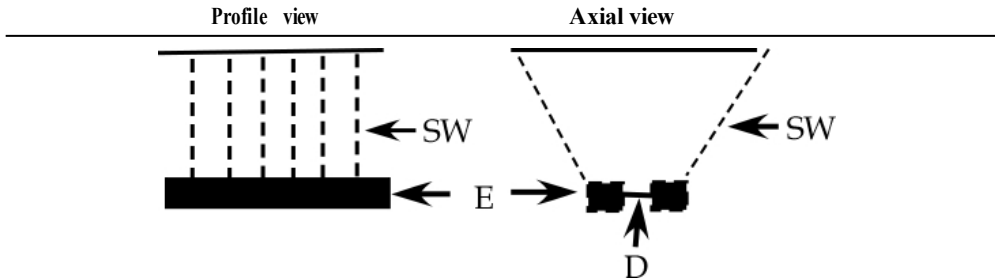


Figure F.7 Two Views of Railgun

See A, B, C of Figure F.8. B depicts the afferent conductor wire and the adjacent parallel efferent wire. C represents the conductor brushes. The remainder of the circuit is located, moreover, fixed to the ground (A).

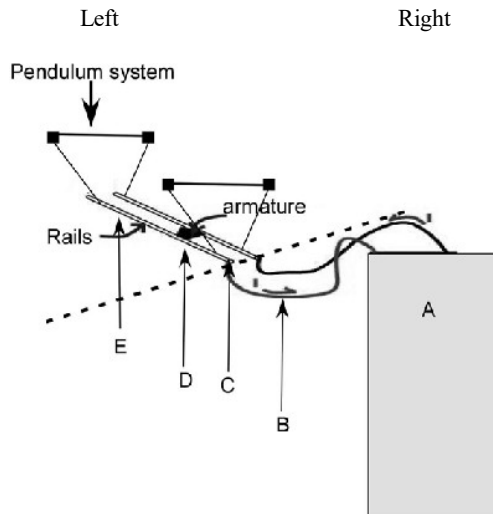


Figure F.8 Details of Railgun Construction

See figures F.5, F.6, F.7, and F.8 above. The rails (E) and the armature (D) with the use of wires (SW) are suspended like a pendulum. For that reason, the apparatus is able to freely rock back and forth, relative to the fixed copper wire conductors (B). The copper wires deliver to and receive current from the rails. Even so, during the pendulum-like motion, the rails are still able to maintain physical contact with the conductor wires by employing copper brushes (C). In addition, in one configuration, the armature can independently move relative to the fixed rails and vice versa. In another arrangement, they are fixed to one another. Furthermore, in the presence of a current, there is motion-gauging equipment, as well as pressure sensitive devices, the latter of which determine the amount of Lorentz force with respect to three different scenarios as presented below.

1. The armature and rails are fixed to each other.
2. The rails are fixed, and the armature is free to move.
3. The armature is fixed, and the rails are free to move.

With respect to each scenario, the experimental results are as follows.

In Scenario 1, whereby the armature and rails are physically attached to one another (Figure F.9), there is a forward net Lorentz force exerted on only the armature. Consequently, the armature pulls the attached rails along with its own motion. In addition, there are symmetrical net Lorentz forces attempting to push the rails apart; nevertheless, they are fixed to each other, so they cannot separate. Notice there is no breech, so no reverse force.

As a result, overall, the armature and attached rails rock forward, similar to a pendulum. In Figure F.9, this forward motion is characterized with the solid horizontal arrow. Observe again, there are no recoil forces.

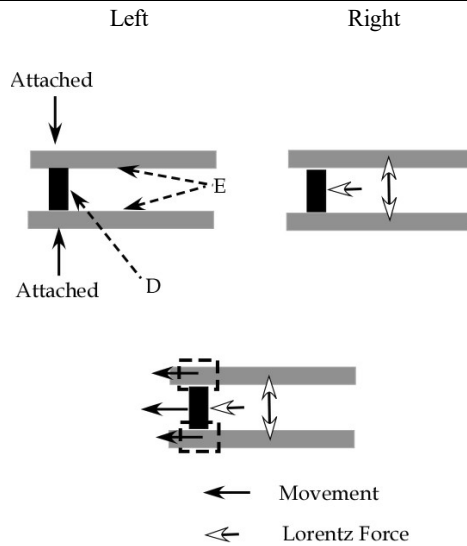
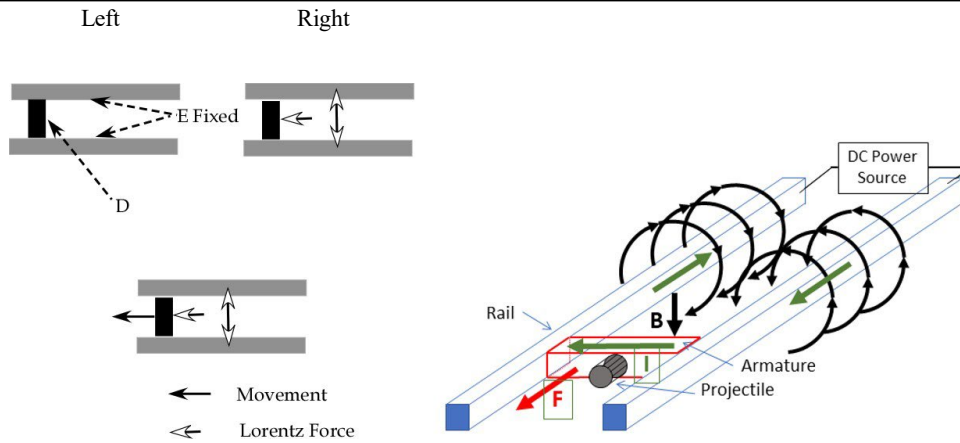


Figure F.9 Details of Railgun Construction—Entire Railgun Propels Forward
 See definition of D and E under the title of Figure F.5

Scenario 1

1. Top left = structure
2. Top right = Lorentz forces
3. Bottom = direction of movement
4. Squares are the attachments

In **Scenario 2**, wherein the armature is free to move, and the rails are fixed (Figure F.10 below), there is a forward net force exerted only on the armature. For that reason, just the armature propels forward. Discern once again, there are no recoil forces.



<http://intercax.com/2018/07/31/mbs-e-railgun-design-part-3/> [Fair Use]

Figure F.10 Details of Railgun Construction—Only the Armature Propels Forward.
See definition of D and E under the title of Figure F.5

Scenario 2

1. Top left = structure
2. Top right = Lorentz forces
3. Bottom = direction of movement

In **Scenario 3**, where the armature is fixed and the rails are free to move (Figure F.11 below), there is no measurable recoil force directed upon the rails. The sensitivity of Scenario 3, regarding the amount of recoil force exerted on the rails, is at least 70 times less than the Lorentz force exerted upon the armature of Scenario 2. For reinforcement, from the frame of the armature, there is no significant equal and opposite reaction force exerted on the rails. Yet again, there is no recoil force at the breech, as there is no breech.

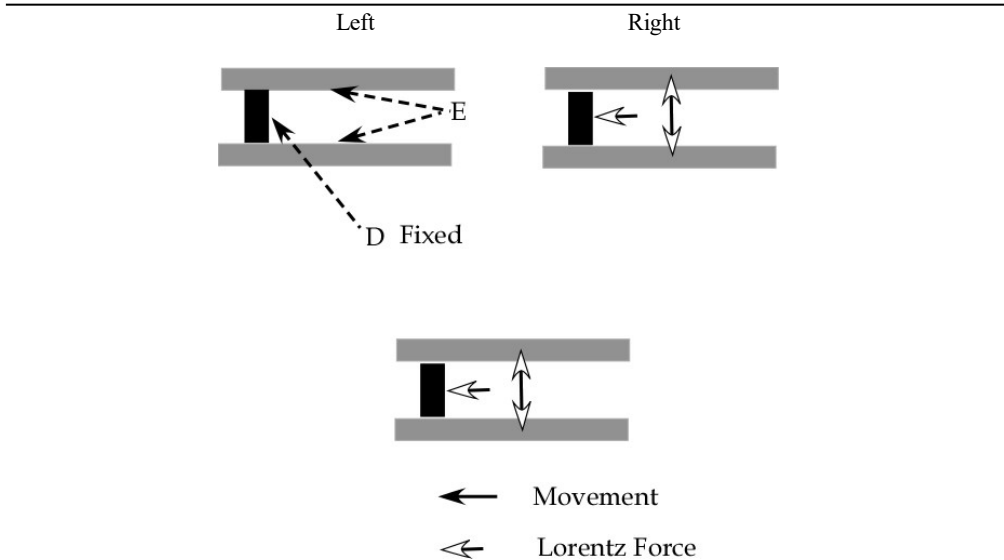


Figure F.11 Details of Railgun Construction—There is no Movement of the Rails or Armature.
 See definition of D and E under the title of Figure F.5

Scenario 3

1. Top left = structure
2. Top right = Lorentz forces
3. Bottom = no movement

There is extensive debate within the literature as to whether the recoil forces of a railgun occur at the junction of the rails with the armature, or alternatively at the breech, presupposing there is a breech with recoil force.

What do these three experiments signify? Basically, as stated by physicist Matthew K. Schroeder, they prove there is no →significant← recoil force located at the juncture of the armature upon the rails (scenarios 1 and 3). Even so, the recoil force could still be located at the breech but only if there is a breech. Otherwise, Scenario 1 violates Newton’s third law.

Now, with reference to this particular experimental device, the breech could include the copper wires, batteries, capacitors, etc. that complete the circuit. They are all positioned to the right side of the dotted line (C), furthermore labeled (C, B, A) as shown in Figure F.5.

Bear in mind, this is not the conclusion as written by Schroeder, rather only the opinion of the author. The device built by Schroeder did not even attempt to measure any forces other than those associated with the armature and rails. Therefore, the notion that recoil forces are possibly located at C, B, and A is only a presumption by the author.

This device, assuming it is a closed circuit with a breech (C, B, A), cannot self-propel in the absence of a propellant. The question is does this experiment contain a closed breech?

Propulsion in violation of Newton’s third law

However, the railgun, as just presented, could be redesigned with a definite incomplete circuit. If so, then it could self-propel devoid of a propellant. This assumption presumes that Newton’s third law does not always apply with respect to the interaction of currents with magnetic fields. And so the design of the Matthew K. Schroeder railgun is altered and revamped as revealed below in Figure F.12 and the following paragraphs.

Now, with respect to this hypothetical device, assume the armature is physically attached to the rails; moreover, the rails are fixed to each other.

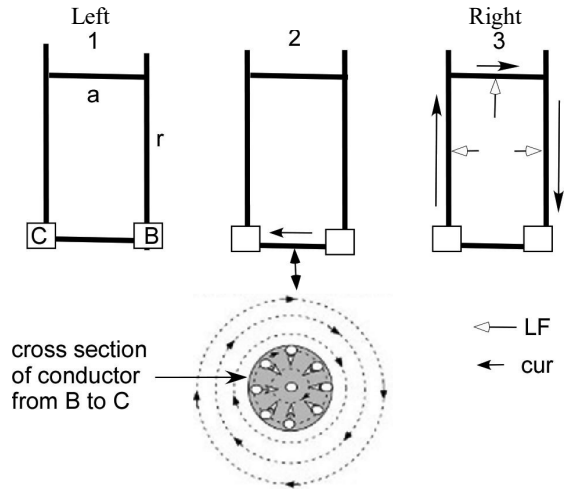


Figure F.12 Self-Propulsion with no Propellant

- | | |
|--|--|
| 1. <i>a</i> = armature | 4. <i>C</i> = capacitor outgoing (afferent) current portion of the capacitor |
| 2. <i>r</i> = rail | 5. <i>cur</i> = current |
| 3. <i>B</i> = battery/generator/incoming (efferent) current portion of the capacitor | 6. <i>LF</i> = Lorentz force |

Time 1 occurs before the advent of the current and represents the physical structure of the device.

Time 2 happens when the current initially flows from B to C, to charge the capacitor. Therefore, as presented in figures F.12 and F.13, during this interval of time, all the Lorentz forces directed upon the lower wire conductor (B to C) are symmetrically oriented towards its center. As such, there is no overall net propulsion. See Figure F.13.

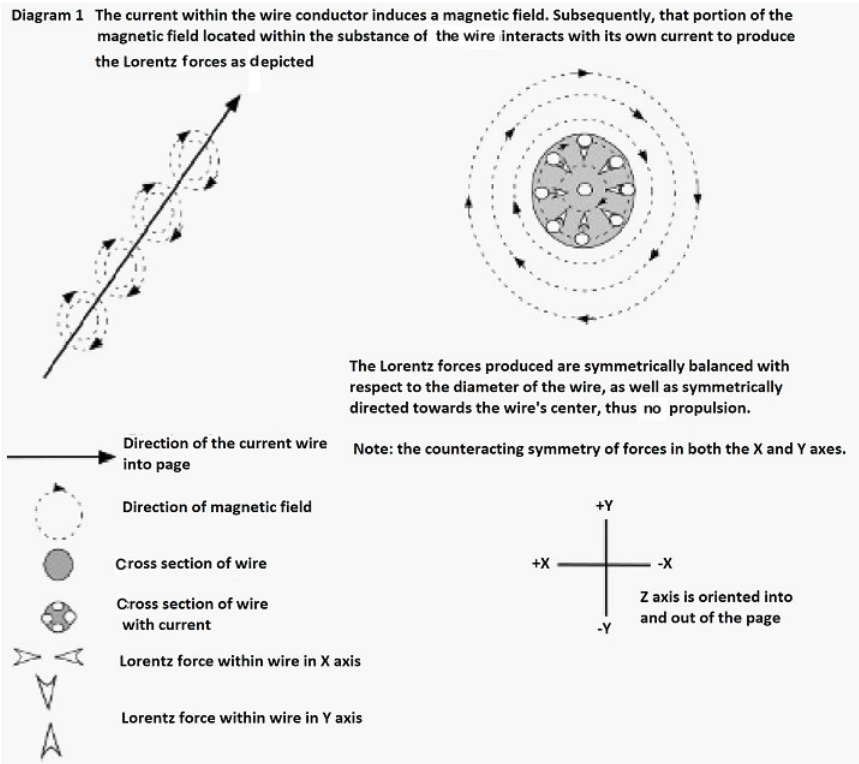


Figure F.13 Lorentz Forces are Symmetrically Oriented Toward the Center of the Wire, So There is No Propulsion.

Time 3 transpires, when the current flows from (C) through the fixed rails and armature, then back to (B). Recollect with respect to Scenario 1, if armature and rails are physically attached to each other, in the presence of a current, there is then a net forward Lorentz force exerted on only the armature, which subsequently drags the attached rails along with its own motion. This function is again shown in Figure F.14 below.

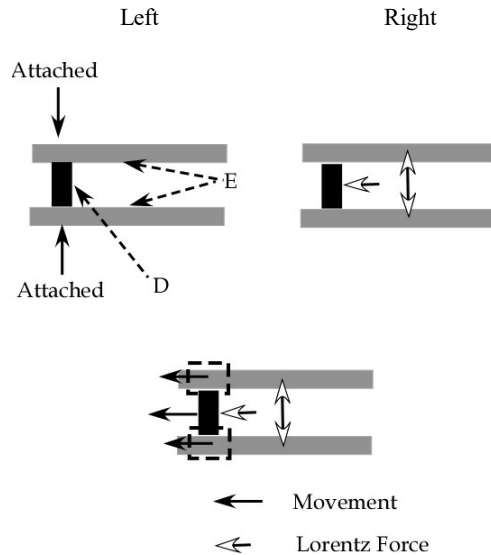


Figure F.14 Details of Railgun Construction
 See definition of *D* and *E* under the title of Figure F.5
 Repeat of Figure F.9

Here is the crucial concept to acknowledge. In this case, there is no breach involving the battery, copper cables, capacitor, or ECT, thus no recoil force. As a result, during this single brief pulse of current, the railgun propels forward in defiance of Newton's third law. This procedure could be repeated in rapid succession. Accordingly, there would be continuous forward pulsating propulsion.

The most important concept to grasp from this appendix is that the magnetic field produced by the current is actually a modification of the ether. So, when this modified ether then interacts with its own current, it produces propulsion without a propellant. Essentially, the current repels or pushes against its own induced modified ether.

APPENDIX G

ELECTRIC CURRENTS, MAGNETIC FIELDS, MAGNETIC PULSES AND ELECTROMAGNETIC PROPULSION

Abstract

A single circular loop conductor (ring) with its current induces a magnetic field, not only surrounding the ring but also within the substance of the ring. Subsequently, that portion of the magnetic field, which is located within the body of the ring, interacts with its own current to produce Lorentz forces. Electromagnetic propulsive forces are produced from this process. However, these forces are either blocked by the intact structure of the ring, or they are symmetrically oriented in opposing directions. As such, these latter forces counteract each other. Essentially, all the forces are balanced; consequently, there is no propulsion of the ring. However, if the magnetic field relative to one side of the plane of the ring is symmetrically distorted by a directed magnetic pulse, then for the duration of this pulse, there will be Lorentz forces within the ring, some of which are not blocked by its physical structure, nor annulled by opposing symmetrical forces. Accordingly, these forces are unbalanced. As a result, there will be electromagnetic propulsion of the ring along its axis.

Introduction

The intention of this appendix is to posit a theory of electromagnetic propulsion based upon an electric current, a magnetic field, as well as directed magnetic pulses (EMP). It is fundamentally a very simple concept based upon these three assumptions:

- A current within a wire conductor induces a magnetic field not only surrounding the wire but within the substance of the wire as well.
- Subsequently, that portion of the magnetic field, which is located within the wire, interacts with its own current, again within the wire to produce Lorentz forces, once more within the wire.
- By means of magnetic flux compression technology, one can project a powerful magnetic pulse in a specific direction, analogous to a gun.

Subsequently, these three assumptions will be used to assemble a hypothetical electromagnetic propulsion device. Due to the complex three-dimensional nature of this concept, it is considerably easier to explain this model if one uses diagrams. For that reason, six diagrams will be presented. Each diagram will present a concept that will lead to the next diagram, until finally the concept of electromagnetic propulsion is explained. The six diagrams are listed below.

1. A single straight wire conductor with a current.
2. Two straight wire conductors with their currents flowing in the same direction.
3. Two straight wire conductors with their currents flowing in opposite directions.
4. A single circular wire conductor (ring) with a current.
5. Two circular wire conductors (rings) with both of their currents flowing in the same direction.
6. A single circular (loop) conductor (ring) with a current, along with its induced magnetic field. The latter of which is distorted on one side, relative to the plane of the ring by a directed magnetic pulse. For that reason, there is electromagnetic propulsion.

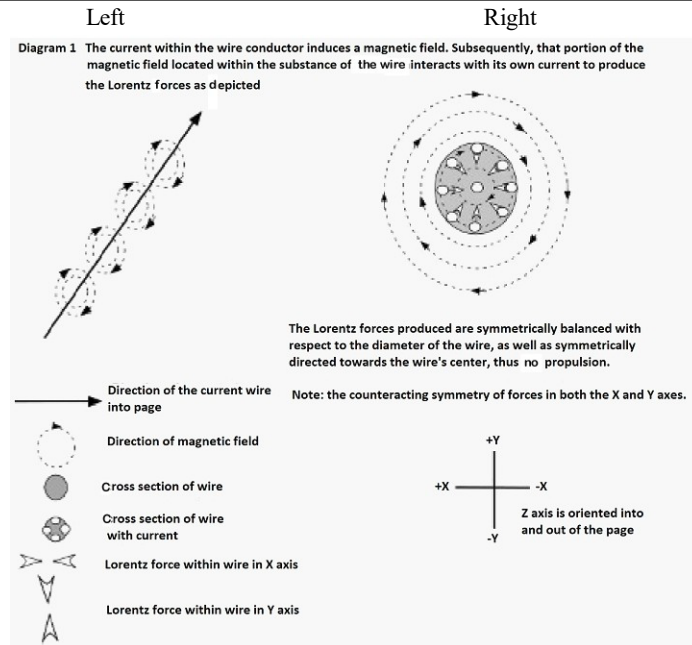


Figure G.1 One Wire with Current Flowing into the Page

Diagram 1 (Figure G.1)

Diagram 1 illustrates a single straight wire conductor, with its current flowing into the page. The wire with its current induces a circular magnetic field, not only surrounding the wire, but also within its own substance. Subsequently, that portion of the magnetic field, which is located within the body of the wire, then interacts with its own current to produce the Lorentz forces as depicted in Diagram 1. Notice, both the density of the magnetic flux, as well as the direction of the Lorentz forces, are symmetric with respect to the wire's diameter. Furthermore, the Lorentz forces are oriented symmetrically in a circle towards its center. This process produces electromagnetic propulsive forces. Nevertheless, due to the above symmetry, these forces are balanced. As a consequence, there is no motion or propulsion. On the other hand, if these forces were somehow asymmetrical rather than symmetrical, there would be propulsion. Nonetheless, this is not the case.

In this and subsequent diagrams, the overall Lorentz forces will be divided into separate vector forces relative to the X (+x,-x) and Y (+y,-y) axes and additionally, with respect to the latter illustrations in the Z axis. For example, in Diagram 1 (Figure G.1), the Lorentz forces counteract each other in both the X and Y axes. However, in reality, all the Lorentz forces are oriented symmetrically in a pattern of a circle towards the wire's center. As such, they again neutralize each other. In both instances, there is no propulsion as these forces are balanced. In essence, the two scenarios are analogous to each other. The author has chosen this method of explanation, so one can easily envision the concepts. Otherwise, the diagrams and description will be too complex to comprehend.

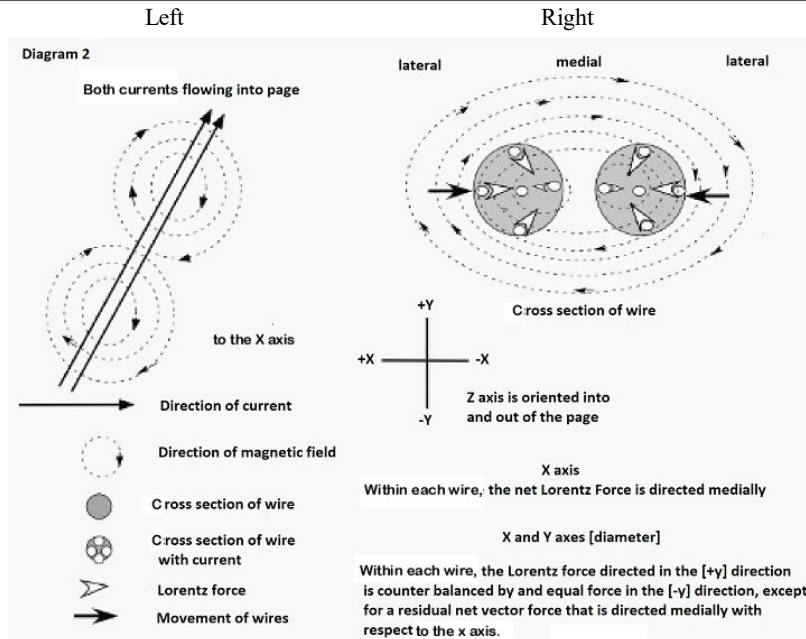


Figure G.2 Two Wires with Current Flowing into the Page

Diagram 2 (Figure G.2)

Diagram 2 depicts two straight wire conductors with both currents flowing into the page. Each separate wire with its current induces its own magnetic field, not merely surrounding itself, but also within its own substance. As illustrated in Diagram 2, the two magnetic fields interact to create one overall modified field. Subsequently, that portion of this one modified field, which is located within the body of each wire, interacts with the current in that same wire to produce the Lorentz forces as illustrated.

Notice with respect to each wire, the density of the magnetic flux in the X axis (+x versus -x directions) is asymmetrical, moreover, greater laterally compared to medially. As a result, the net Lorentz force that is directed medially is greater compared to the force which is directed laterally. Observe as well, relative to each wire, the density of the magnetic flux takes the form of a mirror image symmetrical pattern in the X and Y axes (diameter) relative the X axis. Consequently, the resulting Lorentz forces neutralize one another, except for a residual vector directed medially.

Therefore, overall, with respect to each wire, the direction of the net Lorentz force is medial, as a result, the wires propel towards each other. This process is actually electromagnetic propulsion, nevertheless, impractical, given that once the wires are in contact, all motion ceases. Make a note, outside the substance of the wires in the region of the interacting magnetic fields, there is no force. Forces are located only within the body of the wires, where the one modified magnetic field interacts with each of the two currents.

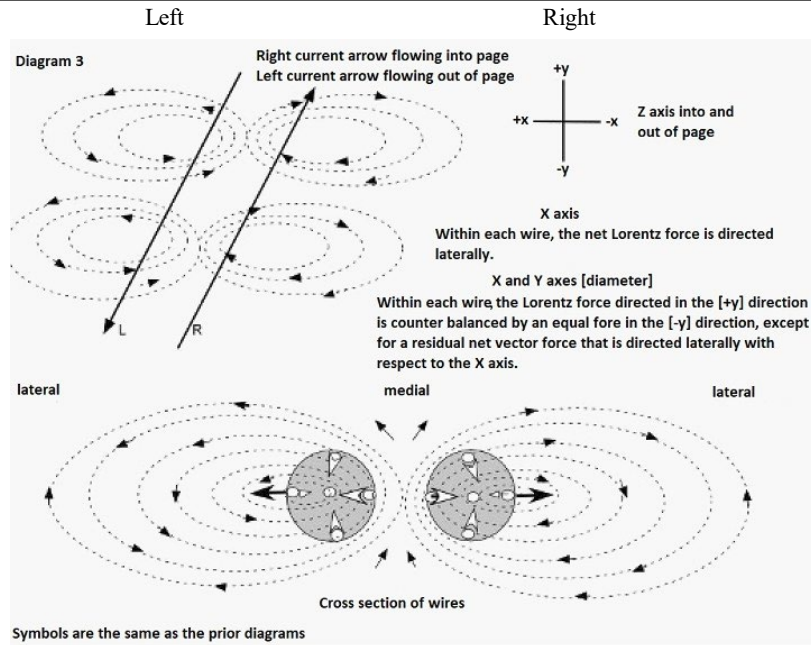


Figure G.3 Two Straight Wire Conductors with Opposing Currents

Diagram 3 (Figure G.3)

Diagram 3 illustrates two straight wire conductors with opposing currents. The left current is flowing out of the page, whereas the right current is flowing into the page. Each current induces its own magnetic field, not only surrounding itself but within its own substance as well. The two magnetic fields interact and form two separate modified fields, as depicted in Diagram 3. Subsequently, that portion of each modified field, which is located within the body of its own wire, interacts with its own current to produce the Lorentz forces as illustrated. Notice relative to each wire, the density of the magnetic flux in the X axis (+x and -x directions) is asymmetrical, moreover, greater medially compared to laterally. Therefore, the net Lorentz force that is directed laterally is greater compared to the force, which is directed medially. Observe as well, relative to each wire, that the density of the magnetic flux takes the form of a mirror image symmetrical pattern, in the X and Y axes (diameter) relative to the X axis. Therefore, overall, the Lorentz forces neutralize each other, except for a residual vector directed laterally.

Consequently, with respect to each wire, the direction of the net Lorentz force is lateral; as such, the wires propel away from each other. Once again, outside the substance of the wires in the region of the interacting magnetic fields, there is no force. Force is located only within the body of each wire, where the current within that wire interacts with its own induced modified magnetic field. This process is electromagnetic propulsion, though again impractical, since once the wires travel a given distance from each other, the two magnetic fields will cease to interact. Subsequently, each will transform into a single wire as depicted in Diagram 1.

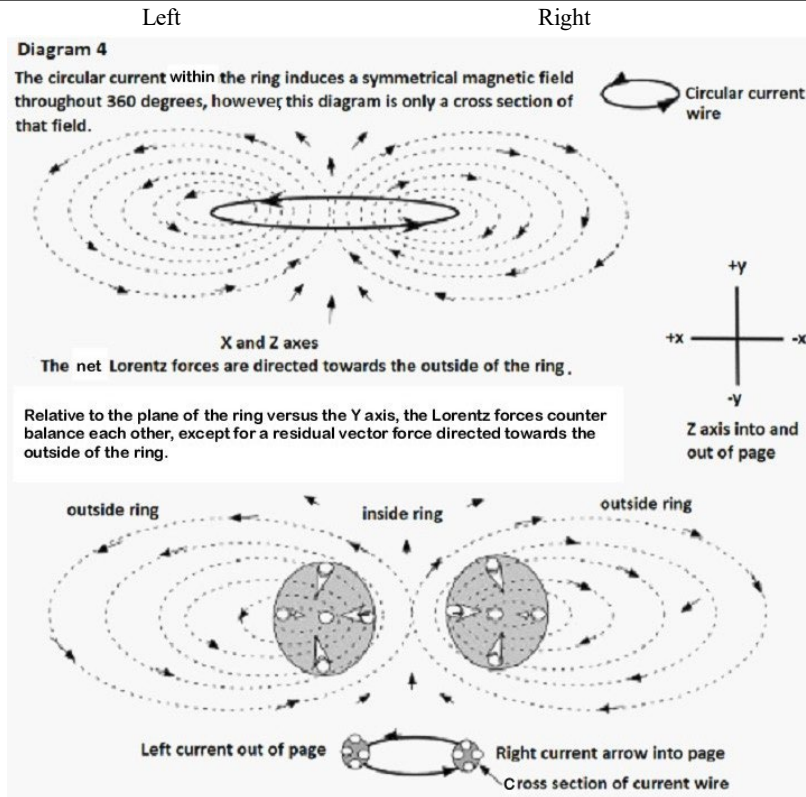


Figure G.4 Current in a Single Circular (loop) Conductor

Diagram 4 (Figure G.4)

Diagram 4 illustrates a current in a single circular (loop) conductor. In future deliberations, this structure will be defined as the ring. The shape of the magnetic field created by this current is equivalent to the classical magnetic field induced by a loop current, as depicted in Diagram 4. The ring with its current produces a magnetic field not just surrounding itself, but also within its own essence. Subsequently, that portion of the magnetic field, which is located within the body of the ring, interacts with its own current to produce the Lorentz forces as depicted. Discern that relative to the plane of the ring, the density of the magnetic flux is asymmetrical, moreover, greater within the inner side of the ring compared to its outer side. Therefore, throughout 360 degrees, the Lorentz forces that are directed towards the outside of the ring are greater compared to those forces which are directed towards its inside. Observe as well, relative to the plane of the ring versus the Y axis, the density of the magnetic flux, within the ring, takes the form a mirror image symmetrical pattern. Therefore, throughout 360 degrees, the Lorentz forces neutralize each other, except for a residual vector, directed towards the outside of the ring. Consequently, with respect to the plane of the ring, the overall net Lorentz forces are directed symmetrically and equally outward, throughout its circumference. Nevertheless, the ring is a physically intact structure; accordingly, it blocks these forces.

All the Lorentz forces produced within the ring are either blocked by its solid structure, or else they neutralize one another. As such, there are no unbalanced forces. Consequently, as previously depicted in Diagram 1, there is again no propulsion. Alternatively, if the Lorentz forces were somehow asymmetrical with respect to the plane of the ring, there would be propulsion. Commit this last concept to memory.

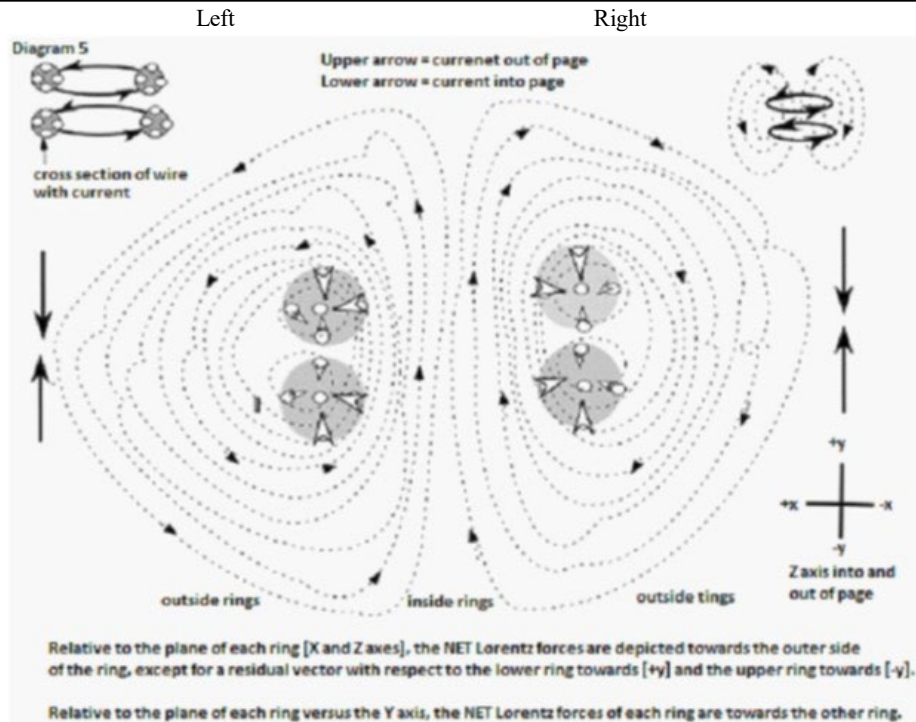


Figure G.5 Two Parallel Ring Conductors

Diagram 5 (Figure G.5)

Diagram 5 illustrates two parallel ring conductors oriented in the same axis with their currents flowing in identical directions. Each ring with its current induces a classically shaped magnetic field of a looped current, not only surrounding itself but within its own substance as well. The two magnetic fields interact to form one overall modified field as depicted. Subsequently, that portion of this overall modified field, which is located within the body of each ring, interacts with the current in that same ring. This produces the Lorentz forces as depicted above. With respect to the plane of each ring, (X and Z axes), the density of the magnetic flux in the ring is greater within the inner side of the ring compared to within its outer side. Therefore, throughout each circumference, the net forces are directed symmetrically towards the outer side of the ring, except for a residual vector towards (+y) with respect to the lower ring, and a residual vector towards (-y) with respect to the upper ring. In other words, relative to the plane of each ring, versus the Y axis, (throughout the ring) there is now an asymmetry of the density of the magnetic flux within each ring. On one hand, with reference to the upper ring, the density of the magnetic flux is greater towards the top of the page (+ y) compared to the bottom of the page (-y). On the other hand, with regard to the lower ring, the density of the magnetic flux is greater towards the bottom of the page (-y) compared to the top of the page (+y). Accordingly, the upper ring's net Lorentz forces are directed towards the lower ring (-y). Conversely, the lower ring's net forces are directed towards the upper ring (+y).

Fundamentally, all the individual Lorentz forces within each ring either neutralize one another, or they are blocked by its physical structure, with the exception of those unbalanced forces, which propel each ring towards the other ring, with respect to the Y axis. Once again, this is electromagnetic production, nevertheless impractical, given that once the two rings are in contact, then all motion ceases. At that time, together, they will act analogous to a single ring, as illustrated in Diagram 4.

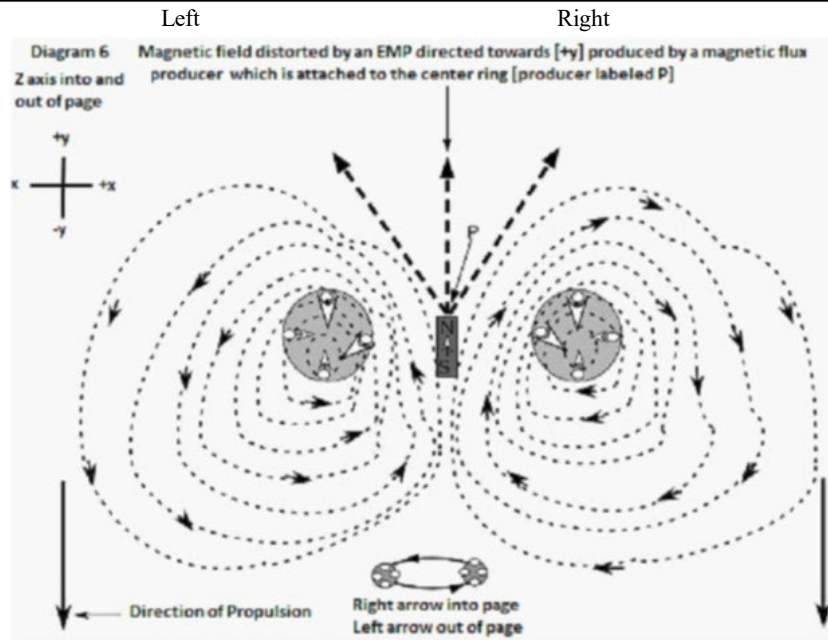


Figure G.6 Magnetic Flux Compression

Diagram 6 (Figure G.6)

In order to comprehend this last and crucial diagram, one must appreciate the concept of magnetic flux compression producers. This apparatus produces an extremely powerful directed magnetic pulse, which can be used as a military weapon, analogous to a gun. However, in this situation, it produces electromagnetic propulsion. Recall in Diagram 4, that relative to the plane of the ring, (X and Z axes), the net Lorentz forces are directed throughout its circumference towards the outside of the ring; nevertheless, the ring remains intact. As a consequence, there is no propulsion. Recollect as well, relative to the plane of the ring, versus the Y axis (throughout the ring), there is mirror image symmetry of the Lorentz forces. As a result, they neutralize one another, with the exception of a residual vector, oriented towards the outside of the ring, again blocked by its intact structure. So, there is no propulsion. In other words, with reference to Diagram 4, there are electromagnetic propulsive forces produced within the ring; yet they are either blocked by its intact structure, or they counteract one another. Essentially, there are no unbalanced forces and so no propulsion.

Now, imagine that from an attached magnetic flux compression producer, located at the ring's center, that a single symmetrical magnetic pulse is emitted. Moreover, assume the pulse is directed axially towards one side, relative to the plane of the ring (+y). Therefore, for an extremely brief period of time, this pulse will distort the shape of the magnetic field on that side. Thus, with respect to the plane of the ring versus the Y axis, the mirror image symmetry previously depicted in Diagram 4 is lost, as now depicted in Diagram 6. Observe, relative to the plane of the ring, at this instant in time, there are symmetrical net vector forces, throughout its circumference, directed towards the outside of the ring, which are neutralized by its intact structure. However, most importantly, there are now other net vector forces, throughout its circumference, directed towards the bottom of the page (-y), that are not neutralized. Given that these latter forces are unbalanced with respect to the Y axis, then during each pulse, there will be electromagnetic propulsion towards the bottom of the page (-y).

Conclusion

To reiterate this concept in simpler words, a circular conductor (ring) with its current induces a magnetic field, not only surrounding the ring but also within its own essence. Subsequently, that portion of the magnetic field, which is located within the body of ring, interacts with its own current to produce Lorentz forces.

There are electromagnetic propulsive forces produced within the ring by this process. However, these forces are either blocked by its intact structure or are symmetrically oriented in opposite directions. Therefore, they neutralize one another. All of the Lorentz forces within the ring are balanced. As a consequence, there is no propulsion of the ring.

Alternatively, assuming that the magnetic field relative to one side of the plane of the ring is symmetrically distorted by a directed magnetic pulse (EMP), then within the ring, there are still Lorentz forces. Nevertheless, in this scenario, some of them are not blocked by its intact structure, nor are they neutralized by other symmetrical opposing forces. As a result, these forces are unbalanced. Consequently, during each pulse, there will be electromagnetic propulsion of the ring along its Y axis towards the bottom of the page. This same procedure could be repeated in rapid succession, thus producing continuous pulsating linear propulsion.

APPENDIX H

THE UNIFICATION OF ELECTROMAGNETISM AND THE EARTH'S MAGNETIC FIELD WITH PERMANENT MAGNETISM

This appendix posits that the magnetic field of a permanent magnet is produced by multiple "solenoid-like" superconducting circular electron currents, all oriented in the same direction (domains), analogous to the magnetic field induced by an electromagnet, as well as the magnetic field generated by the Earth. As a result, the magnetic field of a solenoid, the Earth, and the domains of a permanent magnet are identical processes.

Introduction

At various times throughout the history of physics, a synthesis of purportedly unrelated concepts has occurred, such as the merger of electricity with magnetism by Scottish physicist James Maxwell and the unification of gravity and inertia by Albert Einstein. These amalgamations have simplified our understanding of the physical universe. Additionally, it has led to new theories, what's more, resulted in new inventions.

The goal of this article is to unite electromagnetism (solenoid), the production of the magnetic field by the Earth with permanent magnetism. As a result, assuming this model is correct, hopefully, once again, this synthesis will lead to other breakthroughs, along with new inventions.

For ease of explanation, this appendix will be divided into two sections.

Section 1 will describe the classical explanation of

- A solenoid

- The Earth's magnetic field
- Permanent magnetism

Section 2 posits an alternative model for the production of the dipole magnetic field of a permanent magnet (PM). This makes the magnetic field of an electromagnet, the Earth's magnetic field, and the magnetic field of a PM all a function of the same process.

Section 1

Classical Explanation of:

A Solenoid Electromagnet

A straight wire conductor with an electron current produces a circular magnetic field, not only surrounding the wire but also within the substance of the wire (left-hand rule). In addition, if the conductor is made into a solenoid, then the shape of the induced magnetic field is that of a classic electromagnet (solenoid), possessing both a north and south pole (Figure H.1), analogous to a dipole of a PM.

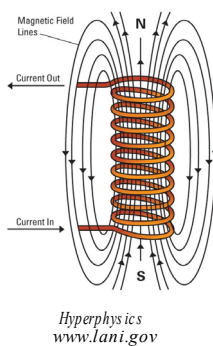


Figure H.1 Solenoid with North and South Pole [Fair Use]

Classical Explanation of:

The Earth's Magnetic Field

Purportedly, the Earth's magnetic field is the product of numerous similarly oriented, very large circular electron currents located within multiple eddy flows of molten magma found deep within the Earth's crust, or alternatively, within the outer portion of its molten core. Fundamentally, this model is analogous to multiple, extremely large electromagnets, the sum of which produces the Earth's overall magnetic field (Figure H.2). Discern that both the Earth's magnetic field, as well as the magnetic field of a solenoid, are the exact same process.

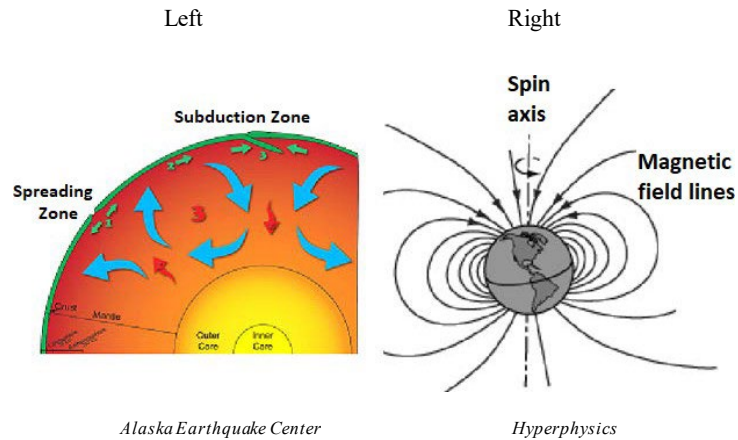


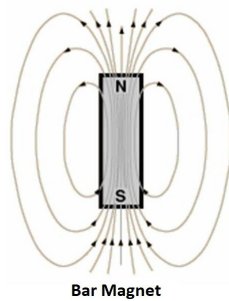
Figure H.2 Magnetic Flux Comparison [Fair Use]

- *Left: Convection Currents in Earth*
In Earth's mantle, large amounts of heat are transferred by convection currents, as shown above. Heat from the core and the mantle itself causes electric convection currents in the mantle. These convection currents cause the Earth's magnetic field.
- *Right: Dipole magnetic field of the Earth*

Classical Explanation of:

A Permanent Magnet

In contrast, the magnetic field of a permanent magnet (PM) is hypothesized to involve an entirely different mechanism. The standard theory postulates that within the substance of a PM, the unpaired outer shell electrons are aligned in the same direction. Additionally, given that each unpaired electron is a small dipole, then the summation of all similarly aligned unpaired dipoles creates the overall magnetic field (Figure H.3). Furthermore, all other randomly oriented dipole electrons, located within the substance of the magnet, counteract one another, therefore, neutralize one another. Consequently, this leaves only the similarly aligned unpaired electrons, the PM's magnetic field.



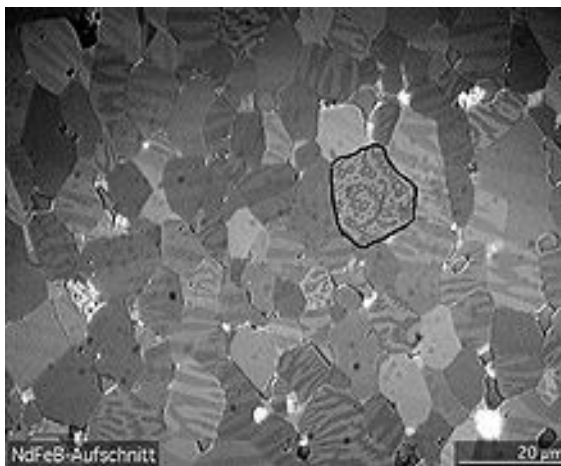
Hyperphysics

hyperphysics.phy-astr.gsu.edu/hbase/magnetic/elemag.html

Figure H.3 Magnetic Field of a Bar Magnet [Fair Use]

Nevertheless, all is not clear-cut. As it turns out, the overall magnetic field of a PM is made up from numerous microscopic sub-units called magnetic domains. Fundamentally, each domain corresponds to a small electromagnet possessing both a north and a south pole. In addition, the domains are composed of the individual electron dipoles all oriented in the same direction. Furthermore, all of the magnetic fields of the domains combine to form one overall general magnetic field.

The domains of a PM are, by and large, fixed in a given direction, consequently, a stable unchanging overall magnetic field. Alternatively, within a ferromagnet (FM), they are only oriented in a specific direction in the presence of an externally applied magnetic field. However, if the external field is removed, then over time, their orientations become random. So, with respect to this second setting, the FM eventually loses its general magnetic field. Pictured below (Figure H.4) are several grains of NdFeB with the magnetic domains made visible via contrast with a Kerr microscope.



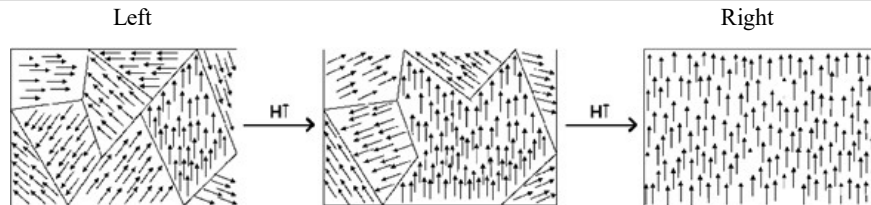
Wikipedia

Figure H.4 Grains of NdFeB with the Magnetic Domains [Fair Use]

The domains of an FM are not fixed structures, because they are malleable. For instance, an individual domain consists of similarly aligned, outer shell, unpaired electron dipoles. In addition, under the influence of an external magnetic field, each of the domains can incorporate into its structure additional

electrons, thus grows physically larger. Simultaneously, the domains reorient themselves so that they are then aligned along with the externally applied field.

This effect is depicted in Figure H.5. The blocks of arrows correspond to the domains. Notice, as the externally applied field increases from left to right, the domains grow progressively larger; moreover, at the same time, they become increasingly oriented in the same direction. Conversely, with the loss of influence of an external field (right to left), they lose electrons, become physically smaller, and concurrently assume a more random pattern. This pliability is much more apparent in an FM compared to a PM, even though it does occur in both.



Wikipedia

Figure H.5 Grains Aligned with Magnetic Field [Fair Use]

Section 2

An Alternative Model for the Production of the Magnetic Field from a Permanent Magnet

Recall that the magnetic domains of a PM are dipole structures. Consequently, there are only two possibilities. They either represent similarly aligned outer shell, unpaired dipole electrons or multiple solenoid-like, circular electron currents, analogous to what occurs within a solenoid. If this is not so, then what other option is there?

For that reason, this new theory posits that the domains of an FM, as well as that of a PM, are composed of "crystal-like groups" of outer shell unpaired electrons traveling in a circular pattern. And just like the standard theory, a ferromagnet's crystal-like domain structure can add or lose electrons depending upon external magnetic influences. As a result, they can change their size, shape, and orientation in the presence or loss of an externally applied magnetic field or from other adjacent domains. In contrast, the crystal-like electron domains of a PM are all fixed in a given direction.

Basically, this new model posits that the magnetic domains are actually stacks of parallel superconducting circular electron currents to some extent analogous to a solenoid. For instance, within each domain, the outer shell unpaired electrons travel from atom to atom in a circumferential manner, thus creating a circular electron current. Additionally, the individual circular units are stacked one on top of another, just as multiple permanent ring magnets will intrinsically stack, assuming similarly aligned poles.

Furthermore, with respect to a PM, in contrast to an FM, most of the domains are oriented **permanently** along the same axis. For that reason, there is then a fixed general overall magnetic field.

Now what evidence do we have that this premise is correct? Listed below are two observations that give support to this new postulate.

1. The outer shell electron structure of a PM is very similar to the outer electron shell configuration of a metal conductor. For instance, the best non-superconductors, such as copper, contain unpaired outer-shell electrons, just like a PM. The major differentiation is that the electron current within a conductor travels linearly from atom to atom, whereas the electron current of the PM travels in a circumferential pattern limited by the domain walls.

In addition, the current within the metal conductor requires a voltage, while the current within a domain of a PM must be superconducting, since it is persistent without the input of energy even at room temperature.

In summary, the similarity of the outer shell electron structures of a PM and that of a metal conductor adds credibility to this new theory because comparable electron configurations should correspond to similar electron functions.

2. To demonstrate further evidence that lends credence to this new theory, the following five magnetic field images are presented. They will reveal that the shape of a magnetic field produced within a permalloy (permanent magnet) is analogous to the appearance of magnetic field generated by a solenoid.

1. A permalloy (permanent magnet)
2. A straight wire conductor
3. A wire loop conductor
4. A permanent magnet
5. A solenoid

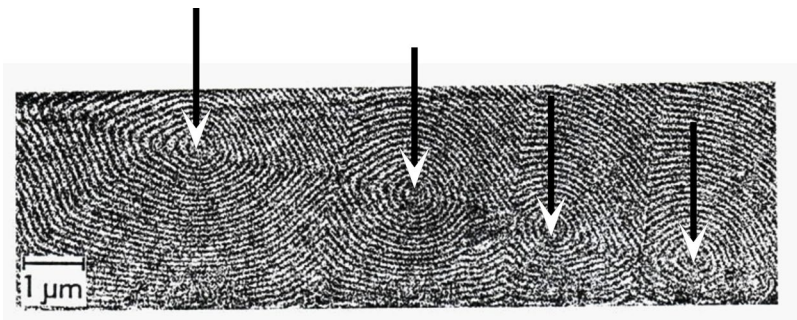
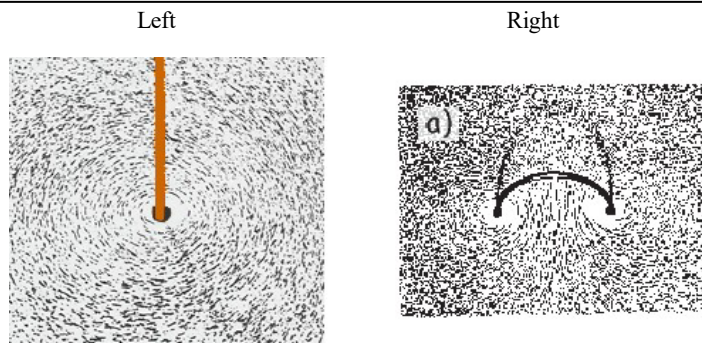


Figure H.6 Magnetic Field Located within a PM [Fair Use]

Figure H.6 shows the shape of a magnetic field painted by electrons within a permanent magnet. This image is from the book titled **The Quantum World Unveiled by Electron Waves by Akira Tonomura, page 77.**

Figure H.6 demonstrates the shape of the magnetic field located within a permalloy. A permalloy, you will note, is analogous to a PM. Observe that there are multiple adjacent circular-shaped magnetic field lines each of which surrounds a central core.



Left image: School for Champions, Ron Curtus https://www.school-for-champions.com/science/magnetic_field_moving_charges.htm#.X4stV2WofzI;
 Right image: Semantics Scholar: [https://www.semanticscholar.org/paper/Magnetic-augmented-rotation-system-\(MARS\)-and-Liu96e8416b2b79ed998f09aa7b6fdccd6690b82284/figure/3](https://www.semanticscholar.org/paper/Magnetic-augmented-rotation-system-(MARS)-and-Liu96e8416b2b79ed998f09aa7b6fdccd6690b82284/figure/3)

Figure H.7 Magnetic Fields - Wire vs. Wire Loop [Fair Use]

Figure H.7 Left illustrates the shape of a magnetic field painted by iron filings induced by a current located within a straight wire conductor.

Figure H.7 Right depicts the shape of the magnetic field painted by iron filings produced by a loop wire current.

Figure H.7 Left illustrates the circular magnetic field lines produced by a current located within a straight wire conductor, analogous to the individual circular units of Figure H.6.

Figure H.7 Right demonstrates the shape of the magnetic field produced by an electron current located within a wire loop conductor.

Once again, observe the similarity of these images compared to Figure H.6, wherein there are multiple circular magnetic field lines positioned side by side, each of which is surrounded by a central core.

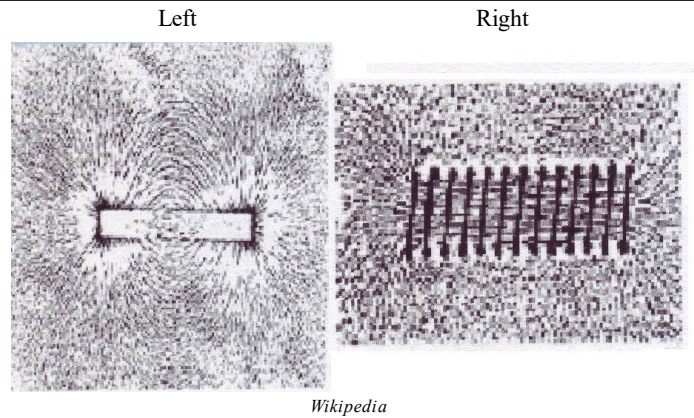


Figure H.8 Magnetic Flux Compression [Fair Use]

Figure H.8 Left demonstrates the dipole of a PM, painted by iron filings.

Figure H.8 Right depicts the dipole of a solenoid painted by iron filings.

Figure H.8 Left illustrates the dipole of a PM and Figure H.8 Right the magnetic field of an EM. Observe the resemblance.

First, imagine a longitudinal cross section of a solenoid as presented in Figure H.9 below.

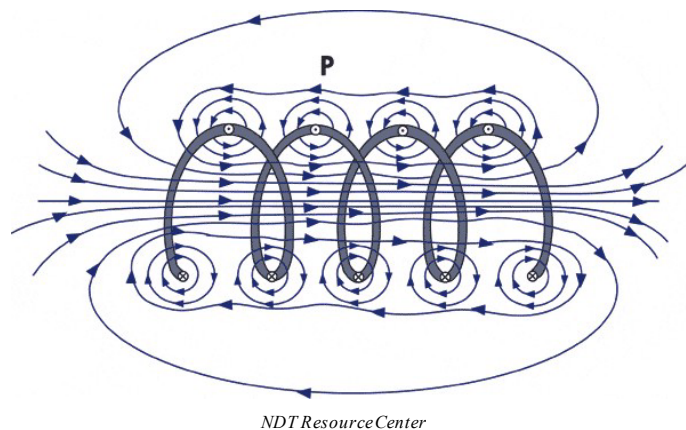


Figure H.9 Cross Section of Solenoid [Fair Use]

Second, visualize the top longitudinal half of Figure H.9 as portrayed in Figure H.10 below.

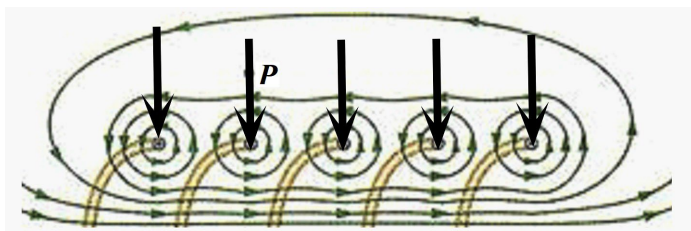


Figure H.10 Upper Half Cross Section of Solenoid [Fair Use]

In addition, picture in your mind a cross section of the wires, including their currents and associated magnetic fields. Then one would envisage, as illustrated above, multiple circular magnetic fields located side by side, each surrounding a central wire or a core.

Third, refer to figures H.11 and H.12 below. Figure H.11 is a photograph of the internal magnetic field of a PM painted by electrons. Figure H.12 is the photograph of the magnetic field of a solenoid painted by iron filings. The arrows placed on both photos depict central points, each of which is surrounded by a circular magnetic field, moreover, they are located side by side, just as they are in figures H.7 and H.10 right. Notice the similarity.

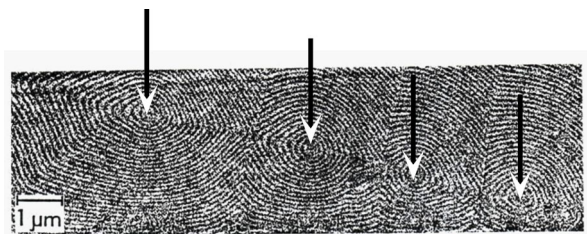
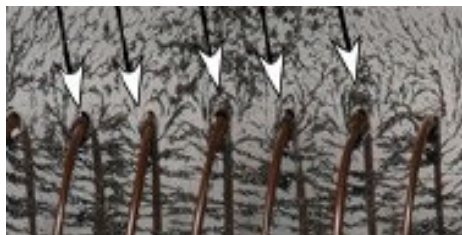


Figure H.11 Magnetic Field of a PM Painted by Electrons [Fair Use]

Image is from the book titled *The Quantum World Unveiled by Electron Waves* by Akira Tonomura.



tsgphysics.mit.edu/front/

Figure H.12 Magnetic Field of a Solenoid Painted by Iron Filings [Fair Use]

Observe the similarity of the magnetic field lines with respect to the internal structure of a PM (Figure H.11) versus a solenoid (H.12).

In summary, given the fact that the outer shell electron structure of a PM and a solenoid are comparable, plus the observation that the internal configuration of the magnetic field lines of both are analogous, these similarities then give credence to the new theory.

This theory posits that each domain of a PM consists of stacks of superconducting circular electron currents corresponding to a solenoid. Even so, although these two scenarios are similar, they are not identical. For example, with reference to a solenoid, there is only a single spiral wire. Alternatively, regarding the domains of a PM, the individual circular currents are positioned one on top of the other, analogous to a stack of coins. Additionally, with respect to a PM, since there is no input of energy, moreover, as there is no production of heat, then the electron currents within the domains of a PM must be self-sustaining. Consequently, they are super-conducting at room temperature.

Furthermore, the magnetic field lines located within the domains of a PM are markedly entrained. This is because they must pass through multiple, extremely compact "solenoid-like"-shaped loop currents, which are not only located on top of one another but also have stacks positioned closely side by side. As a result, the magnetic field lines located within the substance of a PM are not as dispersed compared to that of an EM. This is also due to the fact that the latter does not trap the field lines as much, for its central core consists mainly of air. In effect, the appearance of the internal field lines within a PM are significantly more compact compared to the open central portion of an EM. This divergence is clearly evident with respect to the figures H.11 and H.12.

This appendix posits that the production of the magnetic field of an electromagnet, the Earth's magnetic field, and the magnetic field of a PM are all one and the same process as embodied in figures H.13 and H.14.

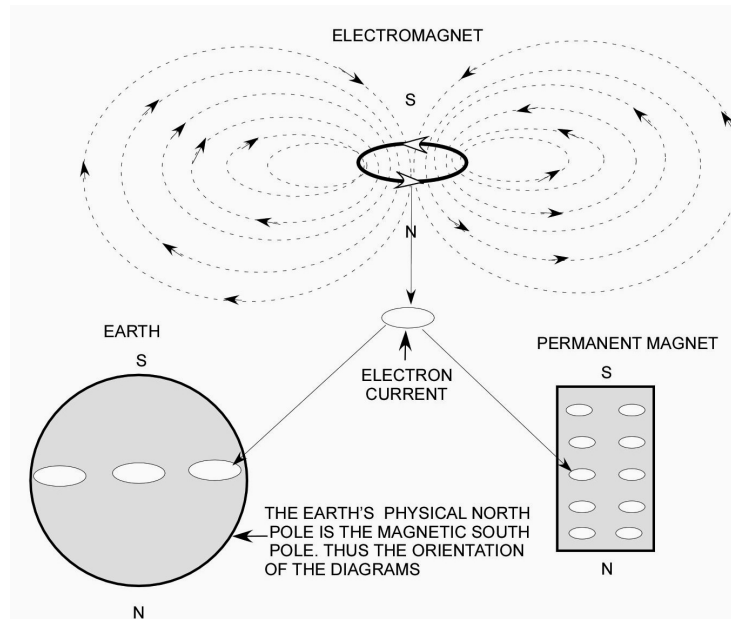


Figure H.13 Same Process Develops for the Electromagnetic, the Earth's Magnetic Field, and a Permanent Magnet.

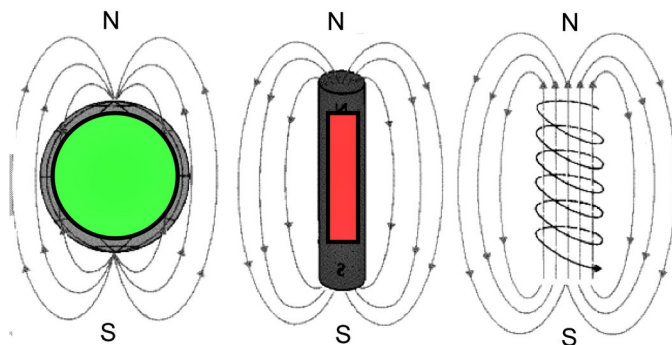


Figure H.14 Magnetic Fields of the Earth, a Permanent Magnet, and a Solenoid [Fair Use]

And so, assuming this new premise is correct, the dipole electron model for the production of the magnetic field of a PM is in erratum, as such, it can be discarded.

In Summary

This appendix demonstrates that the above magnetic fields are, in fact, identical functions. The fields produced by a PM, a solenoid, and the Earth's magnetic field are all related to one basic hypothesis rather than two distinct concepts. This is usually the hallmark of a superior theory, for it is simpler (Occam's razor).

APPENDIX I

PHYSICAL STRUCTURE OF THE ELECTRON

The Three-Dimensional (3D) Physical Shape of the Electron

Presupposing the concepts as now presented in Appendix I are correct, then the dipole model of the electron, as well as other models as classically proposed, are in erratum. For example, according to one classical description, the physical structure of the electron is that of a dipole, a structure with angular momentum = spin. Nevertheless, from a review of the literature, the author cannot ascertain how this model was obtained, except for an extrapolation of the dipole theory of a permanent magnet.

Recall an electron, traveling at a right angle relative to a uniform straight magnetic field is deflected either +90 or -90 degrees sideways with respect to its own direction and also of the uniform field. This dichotomy indicates two types of electron spins (up or down). However, again the author can find no actual experimental evidence that the spin of an electron consists of a revolving particle, analogous to a rotating top with a north and south pole.

With reference to the literature, there are multiple posited models for the 3D physical shape of the electron. However, each is a function of a different theory, such as the classical dipole model of a permanent magnet (PM), and the electron cloud model of quantum mechanics (QM). In essence, no one really knows what an electron looks like three-dimensionally. See quote below from a hyperphysics website:

The property called electron spin must be considered to be a quantum concept without detailed classical analogy. The term "electron spin" is not to be taken literally in the classical sense as a description of the origin of the magnetic moment. To be sure, a spinning sphere of charge can produce a magnetic moment, but the magnitude of the magnetic moment cannot be reasonably modeled by considering the electron as a spinning sphere.

<http://hyperphysics.phy-astr.gsu.edu/hbase/spin.html>

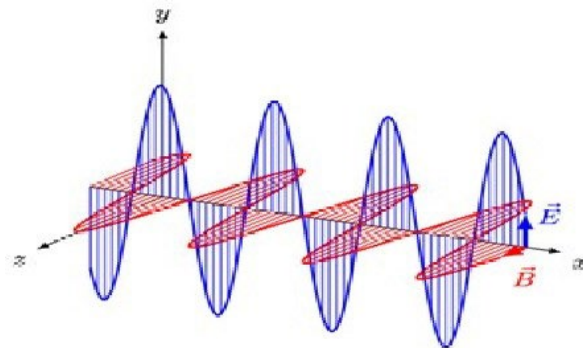
So electron spin is a QM mathematical construct and not a three-dimensional pictorial concept.

Einstein's relativity theories postulate the absence of the ether. This supposition leads to illogical, conclusions, such as the twin paradox problem or the quandary of simultaneity. In contrast, the publication, titled *The Ether*, specifically chapters 1 and 2, puts forward an alternative theory of relativity, whereby there is an ether, moreover, consistent with common sense reality. As a result then, these irrationalities no longer apply.

In the same manner, it is much easier to explain the electron's physical structure presuming the existence of the ether. For that reason, the following attributes are presented. Subsequently, these attributes will be used to explain the 3D structure and function of the electron, furthermore, as a product of the ether.

The Attributes

1. Electromagnetic radiation (EMR) consists of a wave of the ether to some extent analogous to how water waves traverse through water. In addition, EMR is composed of undulating, moreover, alternating right-angled electric and magnetic fields, traveling through the ether (itself) at c . Furthermore, EMR in one of its forms exists as a discrete packet called a photon (see Figure I.1).



Wikimedia Commons

Figure I.1 Electromagnetic Wave [Fair Use]

Figure I.1 shows alternating right-angled magnetic and electric fields—this, in association with a given amplitude and length, is the photon.

2. An electron (matter) is essentially a reorganization of the electric and magnetic fields of EMR. Basically, EMR's linear momentum traveling through the ether at (c) is converted into angular momentum, due to the fact that it spins upon itself. As a result, it transforms into an electron.

However, after this alteration, it is then at rest or near rest with the ether. In addition, EMR'S electric and magnetic fields rearrange to form a central spherical radiating electric field surrounded by a circular magnetic field as illustrated in Figure I.2 below.

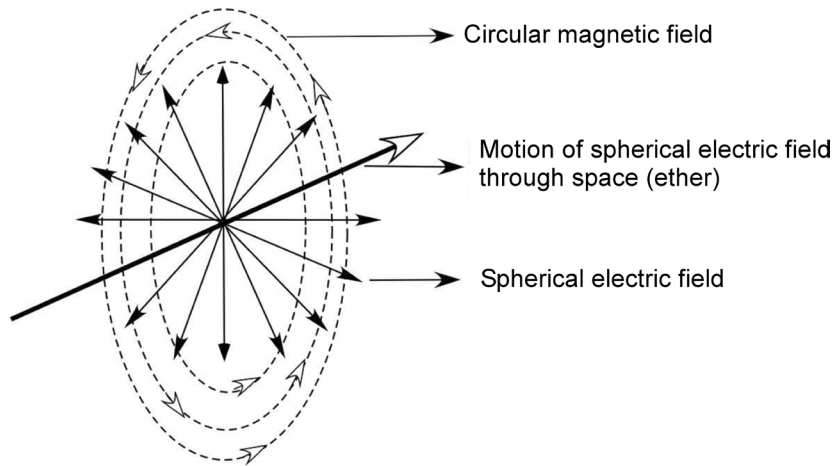


Figure I.2 Spherical Electric Field Surrounded by a Circular Magnetic Field

The electron consists of a spherical central radiating electrical field along with a circular magnetic field, the latter with its plane oriented perpendicular relative its motion through space (ether of PFSRT). Note: there is no particle, only fields.

3. This transformation only occurs as a function of a precise packet with a specific energy (e.g., 0.511 Mev), in other words, a quantum. In addition, as a speculation, the direction of the spin of EMR (photon) could be related to the type of spin of the electron (e.g., up or down).

4. The electron is not a particle with associated radiating fields; rather, the field or fields are the electron, just as EMR consist of only alternating fields. The notion of a particle is only a perception, which occurs when the fields, which are the electrons, then interact with the fields (electrons) of the measuring instrument. As a result, for that measuring instrument, this interaction produces a quantum change in its orbital shell structure. In effect, the quantum interaction involving only fields located within the detector's electron shell structure is what is assumed or perceived to be a particle. Nevertheless, again, there is no particle only fields.

5. All other subatomic structures (protons, neutrons, quarks, etc.) are constructed from electromagnetic radiation, moreover, are fields, since they too are interchangeable with EMR.

6. When an electron and proton, as a function of their opposite electric fields, attract and orbit one another, their magnetic fields also interact in a very complex manner. Bear in mind, the magnetic fields generated by protons (quarks) are much weaker compared to the magnetic fields produced by electrons. However, the different opposite spins of the electrons located within the orbital shells generate equal opposing/attracting magnetic fields. In addition, the nuclear components also possess opposite spins. So, all of this is part of the complex interactions, as well.

7. Therefore, an atom is actually a balance of all of its electric and magnetic fields/forces, which are in a stable state of equilibrium. Additionally, an electron does not orbit the nucleus (proton) analogous to how a planet orbits the Sun. Instead, it orbits the nucleus with a "rapid random-like" orbital pattern.

8. Again, an electron is created from only electric and magnetic fields. As such, neither field is located at a precise location with respect to space (ether). In theory, these fields could extend to infinity. The electron's two fields are spread out over a volume; there is no one specific point with respect to space (ether), whereby one can say the electron exists, but only a region.

9. Given the two assumptions of random rapid motion (momentum vis-à-vis QM) and lack of locality (position vis-à-vis QM), integrated over a short period of time, as an electron orbits its nucleus, it forms a cloud-like pattern. Mathematically, one cannot simultaneously determine the exact position and the exact

velocity of the orbiting electron. Take note, this model is analogous to the quantum mechanics model of the atom.

10. This new theory posits that the complex interacting fields, created by all of an atom's protons, neutrons, electrons, etc., are in a stable state of equilibrium, which is the atom, for this interaction is what holds its constituents together. In contrast, other configurations are unstable. So, with respect to this scenario, the atom decays into other equilibrium forms and/or fields. Fundamentally, different elements are associated with dissimilar equilibrium points, represented by diverse configurations of their complex interacting and orbiting electric and magnetic fields (protons and electrons, etc.). Once again, this concept is consistent with QM.

11. In the same way, molecules, as well as other larger structures, including the magnetic domains of a permanent magnet, are also stable equilibrium points involving large numbers of atoms. What is more, the superconducting circular electron currents located within a magnetic domain of a PM are a function of a stable state of equilibrium relative to a group of electrons moving in a circumferential pattern.

In Summary Up to This Point

Electromagnetic radiation (EMR) is posited to be a wave of undulating, moreover, alternating right-angled electric and then magnetic fields traveling through itself (ether) at c , somewhat analogous to how water waves traverse through water. Additionally, EMR can transform into an electron and vice versa.

Similarly, the electron consists of only electric and magnetic fields, as is EMR. So the only difference between these two entities is the physical configuration of the electric and magnetic fields and their different velocities with respect to the ether. Furthermore, there is no particle for either entity, rather, only fields.

From another perspective, matter is basically a product of the ether. What all this signifies is that space, a vacuum, or what we consider as "nothing at all" is, in fact, by far the most fundamental "stuff" of the universe. So, if the stuff or the ether, assumes the form of a wave that traverses through itself at c , then we define it as EMR. And if at certain fixed units of energy, instead of traveling through itself with linear momentum, it subsequently curls upon itself, moreover, spins with angular momentum (up or down), then it transforms into what we define as matter (e.g., electrons).

Therefore, the matter of the universe is constructed from what the majority of individuals would consider as nothing at all. But in fact, assuming the postulates of this appendix are correct, it is something.

Given the above attributes, which describe the interrelationships of matter, energy, and the ether, moreover, the mechanism as to how this creates what we call the atom, let us now return to the new proposed morphology, as well as the function of the electron.

The Structure and Function of the Electron

In the following paragraphs, please pay close attention to the methodology of the descriptions presented. By understanding how a linear current located within a straight wire conductor produces its circular magnetic field, it is then relatively easy to envisage the actual physical structure of an individual electron.

In actuality, the overall magnetic field produced by a current within a straight conductor is the summation the magnetic field of each of its individual electrons. In point of fact, they are intertwined. This is the rationale for why the explanation below is presented in such a manner.

Before proceeding, recall the classic concept that a current is a positive charge of flow (right-hand rule), whereas an electron current is a negative flow of charge (left-hand rule). This appendix defines a current as a flow of electrons. See figures I.3 and I.4.

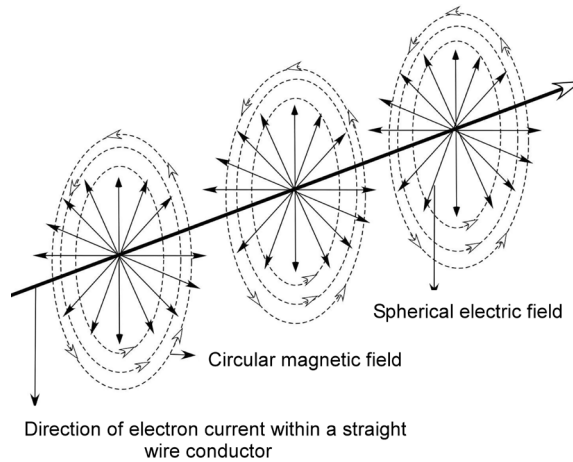


Figure I.3 Image depicts individual electrons of a current within a conductor and their associated electric and magnetic fields.

With reference to a single straight wire conductor with an electron current, the summation of all the magnetic fields produced by each individual electron of that current is what produces the classical circular-shaped magnetic field surrounding the conductor.

Within the conductor there are an equal number of electrons and protons; therefore, there is no overall electric field, because the opposite and equal electric fields neutralize one another. Alternately, there is an overall magnetic field, because all of the magnetic fields do not counteract one another.

Consequently, those magnetic fields not counteracted are the magnetic fields of the current. The summation of all the magnetic fields of the individual electrons depicted in Figure I .3, above, is then Figure I.4 as shown below.

The plane of the circular magnetic field is at a right angle with respect to the direction of the current

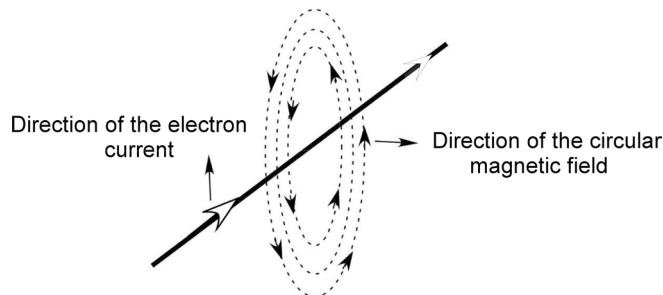


Figure I.4 Summation of Magnetic Fields

The summation of all the individual magnetic fields of all the electrons produces the overall magnetic field of the current left-hand rule.

The electrons of a current, located within a conductor, traverse at a very slow rate. Alternately, the wavefront of the magnetic field induced by the current travels along the conductor extremely fast, in all probability a very high fraction of the speed of light.

This concept is clarified with the following description, then analogy. Under the influence of a voltage, the first electron within the conductor strikes an adjacent second electron, moreover, in the direction of the voltage. In turn, that electron bumps into the next adjoining electron, once again in the direction of the voltage, and so on and so forth, eventually involving the entire conductor's length. This is the electron current.

This is analogous to a single line of pool balls, whereby the eight ball strikes it head on. As a result, the impulse of momentum is transferred along the line from ball to ball. Even so, there is only minimal movement of each individual ball. For example, when an eight ball strikes the first ball head on, its momentum is transferred to that ball. In turn, that first ball transfers its momentum to the second ball and so on and so forth. Now, due to the fact that the last ball receives momentum from the next to the last ball, moreover, as there is no other ball to strike, it leaves the line with a velocity equal to the incoming eight ball. This is assuming no friction and inelastic collisions.

With reference to this analogy, the minimal movement of the pool balls along the line is analogous to the extremely slow velocity of the electron current. And the impulse of momentum relative to the line of pool balls corresponds to the very rapidly moving wavefront of the magnetic field as it travels along the conductor. With respect to the pool ball analogy, as the balls bump into each other, there is resistance, which correlates with the impedance of the current. This effect produces heat.

It is also conceivable, but probably less likely, that the voltage affects all the electrons (current) at once (c), but they cannot travel within the conductor at a rapid rate, because other subatomic entities retard that motion. However, this concept does not explain the rapid traveling wavefront of the circular magnetic field ($<c$).

According to Einstein, an electron **at rest with the observer** is only an electric field. Alternatively, an electron possessing a velocity relative to the observer possesses both an electric field and a magnetic field. In addition, the greater the electron's velocity, the greater then is its magnetic field as an LTF.

In contrast, with reference to the premise of this book, assuming the existence of the ether, then an electron **at rest with the ether (PFSRT)** consists of only a spherical electric field. And an electron traveling with a **velocity with respect to the ether** possesses a circular magnetic field as well. Again, the greater its velocity relative to the ether, the greater then is the magnetic field, moreover, as an LTF, nonetheless limited by the speed of light. In addition, the plane of the electron's circular magnetic field is oriented perpendicular relative to its direction through space (ether of PFSRT). See again Figure I.5, a repeat of Figure I.2.

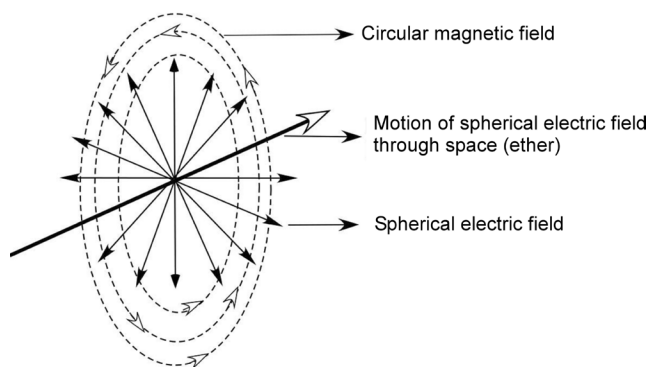


Figure I.5 Repeat of Figure I.2

Spherical Electric Field Surrounded by a Circular Magnetic Field

Taking into consideration this new ether theory, a more likely postulate is that an electron at rest with the ether possesses both a central spherical electric field, and a magnetic field (spin), which represents its basic 3D structure. Additionally, this elementary magnetic field (spin) is what physicists perceive as its dipole magnetic moment. When the electron increases its linear velocity with respect to the ether (PFSRT, SRT), its basic magnetic field (spin) then increases by an LTF (VMF). Furthermore, its plane then orients perpendicular relative to its motion through space (ether of PFSRT).

This book posits that the velocity factor of inflowing space at the Earth's surface is 11.2 km/sec. For future reference with respect to this appendix, the physical inflow of space at the Earth's surface will be defined as the ether (11.2 km/sec).

So, presuming the validity of this premise, then within a metal conductor, absent a current, located at the Earth's surface, all of the electrons and protons possess an equal velocity with respect to the ether (11.2 km/sec).

The conductor consists of approximately equal numbers of electrons and protons. Moreover, both types of particles (fields) possess symmetrically opposing magnetic fields. Therefore, all these diverse magnetic fields counteract one another with the exception of the unpaired outer shell electrons. Even so, these electrons randomly orbit their own nuclei. Consequently, in totality, with reference to these specific unpaired electrons, there is then no overall magnetic field direction, thus also no overall magnetic field. In addition, the opposing equal numbers of opposite electric fields negate one another as well. So, with respect to this reference frame, a conductor absent a current possesses neither an overall magnetic nor an overall electric field.

On the other hand, whenever an electron current is present, these outer shell electrons and only these unpaired electrons, which are in motion as the \rightarrow net \leftarrow current, then possess a greater linear velocity relative to the ether, compared to the protons, with opposing spins, and all other electrons.

In addition, the outer shell unpaired electrons all possess a spin of only one direction. Accordingly, when these specific electrons travel, as the current, within a straight wire conductor, their similarly aligned magnetic fields are then all oriented in the same rotational direction. Furthermore, they have a greater magnetic field compared to all the other electrons regardless of the direction of spin. This is because they possess, compared to all the other electrons, a relative increased velocity with respect to the ether. What is more, these electrons are traveling along the same linear pathway; whereas all the other electrons regardless of direction of spin, summed together, possess no net specific direction.

Therefore, compared to the scenario, absence a current, whereby the opposing magnetic fields negate one another or randomly orbit without net direction, then in this case, where there is a current, the magnetic fields no longer counteract one another. What remains is a circular magnetic field. And this field is a function of only net linear current, which, in turn, is a function of the increased velocities of all these electrons relative to the ether.

Recall again, within the conductor, there is still an equal number of electrons and protons. Therefore, there is no overall electrical field. In addition, the proton's opposing magnetic fields counteract one another. Therefore, once again, all that remains is the circular magnetic field of the net current, a function of the ether.

Conclusion

These are the pertinent concepts.

1. The electron consists of only a spherical central radiating electrical field along with a circular magnetic field, the latter oriented with its plane perpendicular with respect to its motion through space (ether of PFSRT). There is no particle, only fields. See figures I.5 and I.6 (a repeat of Figure I.2).

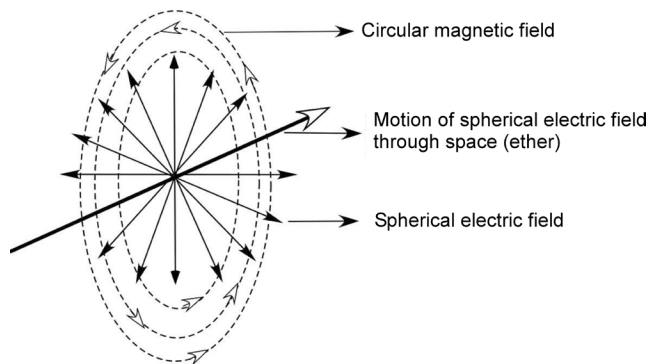


Figure I.6 Spherical Electric Field Surrounded by a Circular Magnetic Field

2. In addition, the circular magnetic field of an electron is only generated when it possesses a velocity relative to the ether (VMF). The higher the electron's velocity relative to the ether, the greater then is its magnetic field, moreover, as an LTF. See figures I.5 and I.6.

3. Furthermore, as above, the circular magnetic field's plane is oriented perpendicular relative to its motion through space (ether).

4. What is more, the overall shape of the magnetic field associated with a n electron current is the summation of the magnetic field from each individual electron of that current as represented in figures I.3 and I.4.

Basically, all one needs to recognize is that within a metal conductor, **without a current**, the opposing electric fields of the protons and electrons counteract, therefore, neutralize one another. Additionally, all the magnetic fields of the protons and electrons, including their opposite spins, also neutralize one another, except the unpaired outer shell electrons. However, they have no overall direction, for they randomly orbit their nuclei. For all these reasons, within a conductor absent a current, there is no overall electric or magnetic field.

In contrast, **if a net electron current exists**, then these specific unpaired outer shell electrons, which are in net linear motion *relative to the ether of PFGRT*, possess, compared to all the other protons and electrons an increased velocity (summation from atom to atom relative to the ether). In addition, these unpaired electrons are aligned along the same linear pathway moreover, with the same direction of spin/rotation. Therefore, the previous negating magnetic field anti-symmetry with respect to the scenario without current is then absent. So, in this case, the opposing electric fields still cancel one another; however, the opposite magnetic fields now do not.

If one assumes that the plane of the circular magnetic field of an electron orients itself perpendicular with respect to its motion through space (ether), then the overall circular magnetic field associated with a straight-wire current is a function of the summation of all the magnetic fields associated with each individual electron of that current.

The key concept to take home is this: the configuration of the magnetic field of a single electron within a current and the configuration of the overall magnetic field produced by an electron current are related to one another. By knowing one, the other becomes visible. This is how the structure, as well as the function, of the electron is known.

Epilogue

The author has several other reservations relevant to this theory. A current consists of a line of traversing electrons. So, as all these magnetic fields interact with one another, individually, their shape changes. For that reason, the configuration of the magnetic field of a single electron at a velocity relative to the ether

may not precisely match its shape, assuming it's a part of a linear current at the same velocity—again, relative to the ether. Nevertheless, there must be at least some correlation.

In addition, the electron is only a spherical electric field, but as it plows through the ether, it distorts that ether, which then is the magnetic field. This is somewhat similar to when a boat plows through water; it distorts that water to form waves. So, the magnetic field and water waves are somewhat analogous. But in contrast to a boat where the water responds to both velocity and acceleration, the ether reacts to only the electron's acceleration.

Furthermore, water's resistance increases exponentially relative to a boat's velocity/acceleration, whereas the ether's resistance increases by an LTF with respect to only the electron's acceleration.

What is more, since there are two directions of electron magnetic field spins (up and down), the spherical magnetic field must also involve two forms. So, as one form plows through the ether, the ether rotates then in one direction. And when the other type plows through the ether, the ether rotates in the opposite direction. These two categories of directional spinning ether are, in effect, the two opposite kinds of the magnetic fields associated with the electron.

APPENDIX J

THE QUANTUM NATURE OF MATTER AND ENERGY AS A FUNCTION OF THE ETHER

The intention of this appendix is to show how the existence of the ether is related to the formation of matter, the quantum nature of the atom and energy, the rest and relativistic inertial mass of the electron (matter), and finally, matter's interaction with electromagnetic radiation.

Introduction

Einstein's relativity theories and quantum mechanics (QM) are two distinct worlds. Moreover, their mathematical formulas are irreconcilable with one another. However, intuition, moreover, common sense tells us that the macro-world of relativity and the micro-world of quantum mechanics are a part of one common overall universe. Consequently, there ought to be one unified theory incorporating mathematics that describes both. Chapters 1 and 2 of this book titled *The Ether* gives explanation to how the presumption of the ether is related to the world of relativity. Therefore, the intent of this appendix is to extend the notion of the ether of PFSRT/PFGRT to the micro world of QM, thereby unifying both worlds. In addition, another objective is to demonstrate that the quantum nature of matter and energy are also a function of the ether.

Quantum Mechanics

Quantum mechanics predicts the outcomes of atomic particles, as well as subatomic physics, with extreme precision. However, the actual physical mechanism as to how this transpires is obscure. Essentially, there is a set of logical input concepts, as well as logical output observations, both represented by mathematical formula. Nonetheless, the visual cause-and-effect relationships, other than math is incomprehensible. Fundamentally, and for reinforcement, visually rational concepts represented by mathemati-

cal equations enter a black box whereby they are manipulated to produce other pictorial output concepts, also expressed by mathematical calculations. Even so, for those results, there are no intuitive logical three-dimensional cause-and-effect relationships, rather, only very complex mathematical formulas.

Here is a quotation by physicist Nick Herbert supporting that notion:

Quantum theory provides a method of calculating the results of any experiment we can imagine, but it gives us no picture of what is going on to produce these results. Quantum reality would be some kind of model or picture that explains the quantum results, some story we can tell ourselves about "what is really happening" behind the scenes. Nick Herbert, quanta@cruzio.com

In addition, some of the consequences derived from QM are irreconcilable with intuitive reality, such as the simultaneous existence of a single subatomic particle at two different locations.

This appendix utilizes an ether model to demonstrate that the quantum nature of matter and energy, as well as the micro world of QM, are actually a function of the ether. Furthermore, it uses common sense logic to demonstrate this fact.

To describe this postulate, a quark model was considered; however, the quark explanation is so complex, that it would be very difficult to grasp. Instead, a modified Bohr model of the atom is presented, generally, although not exclusively, involving the electron, whereby it represents matter. Bear in mind, the electron is a fundamental particle regarding both models. Therefore, the concepts used to describe this modified Bohr model can be equally applied to the quark model.

For simplicity of explanation, this appendix is divided into eight sections each of which describes the three-dimensional physical mechanism as to how the ether interrelates to the micro-world, including the quantum nature of light and matter.

J.1 Matter and Electromagnetic Radiation EMR as a Function of the Ether

J.2 Inertial Mass as a Function of the Ether

J.3 $E = mc^2$ as a Function of the Ether

J.4 The Quantum Structure of the Atom as a Function of the Ether

J.5 Double Slit Experiments as a Function of this New Theory

J.6 Matter and its Interaction with Electromagnetic Radiation (EMR) as a Function of the Ether

J.7 Acceleration of the Electron as a Function of the Ether

J.8 The New QM Theory Compared to Classic QM

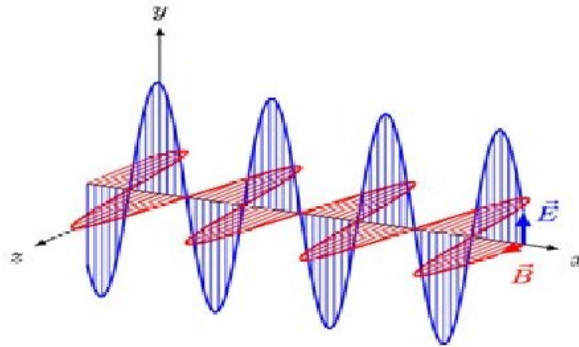
Before proceeding, it should be noted that in order to explain these eight sections, there is considerable redundancy. This is because the different concepts presented utilize the same premises or postulates.

J.1 Matter and Electromagnetic Radiation (EMR) as a Function of the Ether

Einstein's relativity theories assume there is no ether. However, this presumption leads to irrational concepts, such as the twin paradox problem, as well as the quandary of simultaneity. Alternatively, chapters 1 and 2 of this book titled *The Ether* employ its existence to hypothesize a modified theory of relativity, whereby these irrationalities no longer exist, therefore, consistent with common sense. In the very same way, referring to the micro-world, if one posits the existence of the ether, this presupposition then simplifies the understanding of many atomic and subatomic phenomena. Most importantly, it unites both worlds.

The following descriptions are attributes (A through I) whereby light (EMR) and matter are pictured to be a function of the ether.

A. Electromagnetic radiation (EMR) is a wave of the ether, to some extent analogous to how water waves traverse through water. In addition, EMR consists of sequential alternating right-angled electric and magnetic waves, traveling at c . (See Figure J-1.) Furthermore, in one of its forms, it takes on the configuration of a packet of energy with a given length defined as photon or quantum.



Wikimedia Commons

Figure J.1 Electromagnetic Wave [Fair Use]

Figure J.1 illustrates alternating right-angled magnetic and electric fields. This, in combination with its given amplitude and length, is the photon.

B. An electron (matter) is essentially a reorganization of the electric and magnetic fields of EMR. In other words, EMR's linear momentum traveling through the ether at (c) is converted into angular momentum. This is because it spins upon itself. As a result, it transforms into an electron, however, now at rest or near rest with respect to the ether. In addition, the EMR's electric and magnetic fields reorganize, to form a central radiating spherical electric field surrounded by a circular magnetic field as illustrated below in Figure J.2.

Furthermore, this transformation only occurs with respect to a precise unit of specific energy, a quantum. As a conjecture, the direction of the spin of the EMR, as it transforms into an electron, could be related to the direction of the spin of the electron (e.g., up or down).

C. This process is even more complicated. For instance, Einstein's relativity theories posit that an electron at rest with the **observer** is only an electric field. In addition, it postulates that an electron with a velocity relative to the observer possesses both an electric field and a magnetic field. Furthermore, the greater its linear velocity with respect to the observer, the greater is the magnetic field as a LTF.

D. On the other hand, presupposing the ether's existence, then an electron at rest with the **ether** consists of only a spherical radiating electric field. And an electron traveling at a velocity with respect to the ether possesses both a spherical electrical field and a circular magnetic field. Additionally, the greater the linear velocity, the greater is its magnetic field as a LTF. Furthermore, the plane of the magnetic field is oriented perpendicular with reference to its motion through the ether.

E. However, a more likely model is this: an electron at rest with the ether possesses both a central spherical radiating electric field and a circular magnetic field (spin magnetic field). Essentially, this is its primary structure. Now, in the setting where the electron is at rest with the ether, the circular magnetic field represents its magnetic moment (spin). In contrast, when an electron possesses a velocity with respect to the ether, this primary circular magnetic field then increases/enlarges (it becomes the velocity magnetic field). What is more, its plane becomes oriented perpendicular relative to its motion through space (ether) as portrayed in Figure J.2 below.

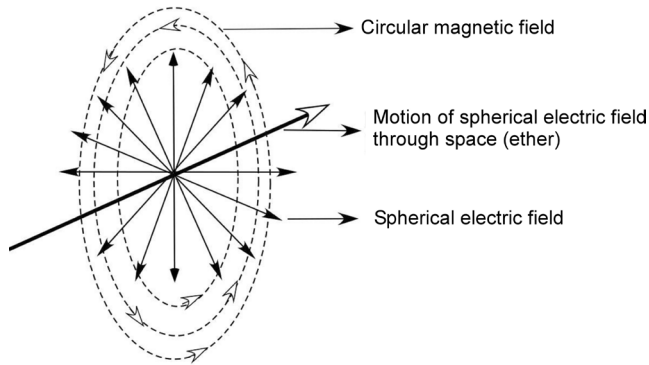


Figure J.2 Spherical Electric Field Surrounded by a Circular Magnetic Field

The electron consists of only a spherical central radiating electrical field along with a circular magnetic field, the latter with its plane oriented perpendicular relative to its motion through space (ether). There is no particle, only fields.

F. It is a well-known fact that the magnetic field, induced by an electron current located within a straight wire conductor takes on the form of a circle. This configuration is the sum of the shape of the magnetic field of each individual electron of that current. Consequently, logic then tells us, that the shape of the magnetic field around each of those electrons must also be that of a circle. Likewise for each electron, the plane of the circular magnetic field is oriented at a right angle relative to its motion through the ether, which is the direction of the current within the straight wire conductor.

This function is illustrated in figures J.3 and J.4. Observe that the summation of the magnetic field created by all of the single electrons, including orientation (Figure J.3), produces the typical circumferential magnetic field of a straight wire conductor containing an electron current (Figure J.4).

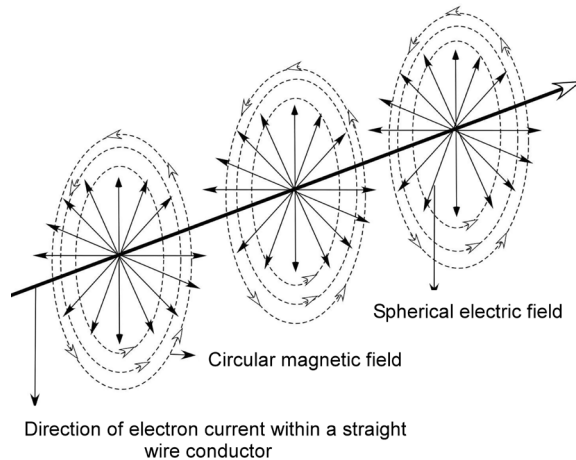


Figure J.3 Individual Electrons of a Current with their Associated Electric and Magnetic Fields

With reference to a straight wire conductor containing an electron current, that the summation of the circular magnetic field of each electron of that current is what produces the typical overall circumferential magnetic field, classically associated with that form of conductor.

Additionally, within the conductor, because there are an equal number of electrons and protons, there is no overall electric field, as these opposing electrical fields counteract one another.

Furthermore, all the other opposing magnetic fields produced by the electrons and protons, including the opposite spinning electrons, counteract one another, with the exception, as above, of the circular magnetic fields generated by all the similarly aligned unpaired outer shell electrons traveling linearly in the same direction at an increased velocity relative to the ether—this is the electron current with its associated magnetic field.

→Bear in mind that the electron current is a net current since the electrons travel from atom to atom within the conductor very slowly but orbit their nuclei very rapidly←.

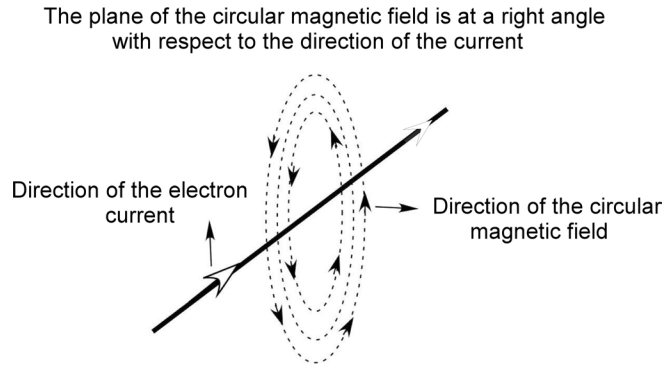


Figure J.4 Summation of Magnetic Fields

The sum of all the fields of the electrons in Figure J-3 produces the overall magnetic field of the current as depicted above in Figure J.4.

G. The electron is not a particle with associated radiating fields—rather, the field or fields are the electron—just as EMR consist of only alternating fields. The notion of a particle is only a perception, which occurs when the fields, which are the electron, then interact with the fields (electrons) of the measuring instrument. So, for that measuring device, this interaction then produces a *quantum* change in its orbital shell structure. Essentially, the quantum interaction involving only fields located within the detector’s electron shell structure is what is then perceived as a particle.

H. To recap, the constituents of matter (electrons, protons, quarks, etc.) can morph into electromagnetic radiation and vice versa. Basically, both matter and EMR are created from the same fundamental electric and magnetic fields, although with a dissimilar arrangement, along with a different velocity relative to the ether. In addition, this transformation occurs with respect to a given packet of energy. For example, given the proper circumstances, a photon (EMR) traveling at c , moreover, as part of the ether, curls and spins upon itself, thus transforming into a spinning electron (field) now at rest with the ether. Because this bidirectional transformation only occurs at specific values of energy, it is then a part of QM.

I. In the same way, all other subatomic structures (e.g., protons, quarks, etc.) are fashioned from electromagnetic radiation (fields), as they too are interchangeable with EMR.

In summary, what all this signifies is that space, a vacuum, or what one would consider as “nothing at all” is, in fact, by far the most fundamental “stuff” of the universe. Now, if this stuff (or ether) forms a wave (energy) that traverses through itself at c , we define it as electromagnetic radiation. And if at certain fixed packets of energy, instead of traveling with a linear velocity at c , it curls upon itself, moreover, spins with angular momentum, then it transforms into matter (e.g., electrons). The matter of the universe is formed from what the majority of individuals would consider as “nothing at all,” or expressed in other lexicology, the ether. If one thinks about it, the term “ether” makes more sense, given that it signifies something rather than nothing.

J.2 Inertial Mass as a Function of the Ether

This new theory posits that relative to the ether, when the velocity of an electron increases linearly, its relativistic inertial mass then increases by an LT function. Similarly, with reference to the ether, this theory presumes that as the velocity of an electron increases linearly, then in the same way, its circular magnetic field increases by an LT function. Take note of the identical relationship. For this reason, the author postulates this theory: the electron's increased magnetic field is what produces, and is, the increased relativistic inertial mass. This is compared to its rest inertia mass, which occurs whenever the electron is at a 0 velocity with respect to the ether.

Dr. Marmet's abstract proposing this hypothesis is given below:

Relativity theory gives a relationship predicting the increase of mass of relativistic moving particles, but no physical model has been given to describe the fundamental physical mechanism responsible for the formation of that additional mass. We show here that this additional kinetic mass is explained by a well-known mechanism involving electromagnetic energy. This is demonstrated taking into account the magnetic field generated by a moving electric charge, calculated using the Biot-Savart equation. We show that the mass of the energy of the induced magnetic field of a moving electron is always identical to the relativistic mass deduced in Einstein's relativity. Therefore, the relativistic parameter can be calculated using electromagnetic theory.

Also, we explain that in order to satisfy the equations of electromagnetic theory and the principle of energy and momentum conservation, toroidal vortices must be formed in the electric field of an accelerated electron. Those vortices are also simultaneously compatible with the magnetic field of the Lorentz force and the well-known de Broglie wave equation. This leads to a physical description of the internal structure of the electron in motion, which is at the same time compatible with the Coulomb field, the de Broglie wavelength equation, mass-energy conservation and with the magnetic field predicted by electromagnetic theory. That realistic description is in complete agreement with all physical data and conventional logic. The paper concludes with an application, which is a first classical model of the photon, fully compatible with physical reality, without the conflicting dualistic wave-particle hypothesis.

This inertial mass proposal and quote were obtained from the article titled *Fundamental Nature of Relativistic Mass and Magnetic Fields* authored by Paul Marmet, published in the International IFNANS Journal "Problems of Nonlinear Analysis in Engineering Systems," No.3 (19), Vol.9, 2003, Kazan University, Kazan City, Russia.

To recap, whenever an electron's velocity increases linearly with respect to the ether, then the magnetic field induced by this process increases by an LTF. And so, for that electron, this effect produces an increased resistance to its further acceleration by force = increased relativistic inertial mass. The electron's relativistic inertial mass is a function of its magnetic field. In turn, that magnetic field is a function of its velocity relative to the ether.

This unique concept is easily perceived when visualizing a single electron, however, not apparent with large non-ionic matter (object). However, recall, typically matter is constructed from an equal number of electrons and protons containing opposite electric fields. Therefore, they counteract one another. As a result, for that object, the overall electric field is null.

In addition, the object's protons compared to its electrons are associated with unequal magnetic fields. Recall that the electron's magnetic field is greater than the proton's field. However, within the atom, electrons and protons also possess two types of symmetrically opposite directional spins. So overall, within the object, there is an equal number of opposing magnetic fields. As a consequence, all these complex opposing magnetic fields negate one another. And for that reason, and for that object (matter), there is also no overall magnetic field.

Relative to the ether, when matter (object) is accelerated by force, resulting in an increased velocity (e.g., 0.1c to 0.5c), its relativistic inertia mass then increases. So, with respect to this new theory, how does this transpire? Here is the reasoning. While increasing its velocity relative to the ether, moreover, within the object, there is a symmetrical increase involving all of the counteracting magnetic fields, produced by all of the protons and electrons. And so, taken as a whole, even though this increase exists (the inertial mass increases), the opposing magnetic fields still mask one another. In effect, for that accelerated object, there is no apparent overall magnetic field. Nevertheless, the remaining effect is an in-

crease in its relativistic inertial mass.

Note, the unpaired electrons have no corresponding counteracting opposing magnetic field, but as they randomly orbit the nucleus, there is no net direction. Therefore, referring to these specific electrons, there is no net magnetic field.

J.3 $E = mc^2$ as a Function of the Ether

Einstein’s equation of $E = mc^2$ posits that energy and matter are equivalent, moreover, inter-changeable. Mathematically, this is straight-forward. Nevertheless, it is very difficult to visualize a non-mathematical physical mechanism as to how this actually transpires. On the other hand, bearing in mind this new theory, it is fairly easy to envision, for example, regarding the electron.

Fundamentally, it involves two separate functions.

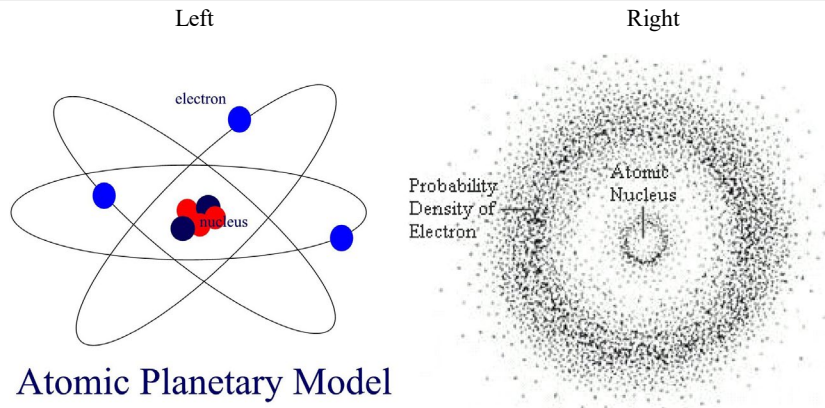
The first is the transformation of electromagnetic energy into subatomic particles (electron). This process occurs as a function of a specific packet of energy, then producing the inertial rest mass of the electron and at a 0 velocity relative to the ether. Remember that the electron is an electric spherical field/force of *energy*. This is of our simplified model.

The second process: as the rest inertial mass of an electron increases its linear velocity with respect to the ether, its magnetic field then increases by an LTF. In essence, the increased magnetic field/force, which is again *energy*, is the electron’s relativistic inertial mass.

When observing both scenarios, one can easily picture the actual physical mechanism whereby *energy* is related to the rest inertial mass and the relativistic inertial mass of the electron, or in other terminology, how $E = mc^2$. Bear in mind if everything is made up of only fields, then matter is a form of energy and not vice versa (as there is no particle/matter—only fields).

J.4 The Quantum Structure of the Atom as a Function of the Ether

Again, this new model assumes that both matter and EMR are composed of only electric and magnetic fields. Additionally, it uses the presumption of the ether, to posit a modified Bohr model of the atom, analogous to the electron cloud model of the atom (QM). So as illustrated in Figure J.5, the classic Bohr Model on the left is transformed into the modified Bohr model on the right. Furthermore, this section describes how the new proposed model is consistent with the quantum nature of matter and energy.



Wikipedia

Figure J.5 Bohr Model vs. the Electron Cloud Model [Fair Use]

In order to understand this last premise, assume the following attributes.

A. Again, matter (electrons and protons) is a product of electromagnetic radiation (EMR), the latter of which, when given the proper circumstances, instead of traversing linearly through space (ether) at c , curls, moreover, spins upon itself, transforming into matter (charged particles [fields]) with spin. This includes positively charged protons, as well as negatively charged electrons, which then attract one another.

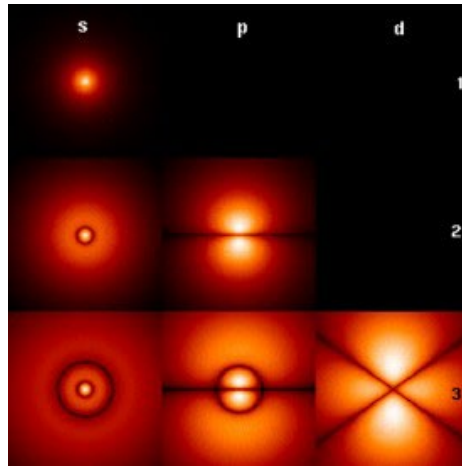
B. An electron is made up of only electric and magnetic fields. In addition, neither field is located at a precise point with respect to space (ether). In theory, these fields extend to infinity, although this may not, in fact, be true. Regardless, the electron's two kinds of fields are spread out over a volume. Essentially, there is no one specific point with respect to space (ether) whereby one can say the electron exists, rather only a region.

C. When electrons and protons, due to their opposing electric fields, attract, therefore, orbit one another to eventually form an atom, their magnetic fields, at the same time, interact in a very complex manner. Bear in mind, the magnetic fields generated by protons (quarks) are significantly weaker compared to that produced by electrons. Nevertheless, the opposite spins of the electrons within orbital shells have equal counteracting magnetic fields. Likewise, there are equal opposing magnetic fields within the nucleus. So, all of this is also a part of the complex interactions as well. As a result, an atom consists of an overall equilibrium of all of its electric and magnetic fields, which are in a stable state; called an atom.

D. An electron does not orbit the proton (nucleus) similarly to the way planets orbit the Sun. Instead, it orbits the nucleus in a "random-like" orbital pattern, moreover, at an extremely rapid velocity. Again, the electron's magnetic field is spread out over a volume. So given these two assumptions of rapid random motion and lack of locality, then integrated over a short period of time, as an electron orbits its own nucleus, it then forms a cloud-like pattern surrounding it. This is analogous to the QM model of the atom.

E. Effectively, one can only determine a probability of the electron's location (position vis-à-vis QM), seeing as it is spread out over a region. Additionally, one can only determine a probability of its velocity (momentum vis-à-vis QM), since it travels in a random pattern, moreover, with today's equipment, too fast to accurately measure. Observe, by using these presumptions, the classical Bohr Model transforms into the modified Bohr Model, which is analogous to the cloud model of QM (Figure J.5).

F. This new theory posits that the complex interacting fields, created by all of an atom's proton and electrons are in a stable state of equilibrium. This produces an atom, since this is what holds its constituents together. In contrast, some other states are unstable. So, in that case, those configurations decay into another equilibrium point or points and fields. In addition, each of the elements is associated with a specific unique equilibrium. Furthermore, for some elements, the stable interactions are extremely complex. So, as shown in Figure J.6, these kinds of elements possess odd configurations, such as a donut or a bar bell, once again just like QM. Incidentally, the different de Broglie wavelengths associated with the orbiting electrons are a part of the stable equilibrium configuration, as well.



Wikipedia

Figure J.6 Complex Interacting and Orbiting Electric and Magnetic Fields [Fair Use]

Fundamentally, each element is associated with a specific equilibrium point, represented by diverse configurations of their complex interacting and orbiting electric and magnetic fields as illustrated above.

G. In the same way, molecules, as well as other larger structures, including the magnetic domains of a permanent magnet, are also stable configurations involving huge numbers of atoms.

H. This same model is applicable to protons, neutrons, as well as quarks (all are actually purely fields). For example, each subatomic unit of the nucleus possesses its own electric field, magnetic field, weak force field, and strong force field. All these complex fields interact to form the nucleus but only with respect to a specific stable equilibrium. This hypothesis makes more sense if one presupposes that the quarks orbit each other, or alternatively the protons and neutrons orbit each other. Essentially, these specific equilibrium stabilization points associated with different numbers of protons and neutrons represent the nuclei of the different elements.

I. Recall, some elements decay into other elements, particles, and EMR. So, in this setting, the equilibrium point for that particular type of atom is not absolutely stable over time. Generally, the complex interacting fields are stable. Nevertheless, on an extremely rare occasion, as they interact, the total configuration assumes an unstable form. When this happens, a subatomic unit, a photon, or even both is/are ejected from the nucleus. These are all fields. Simultaneously, the remaining subatomic units/fields rearrange to form a new stable equilibrium point or points. Alternately, for some elements, rather than rarely, this function occurs rapidly without delay.

J. These equilibrium points are a function of how matter (fields) and EMR (fields) interact, which in turn, is a function of the quantum nature of the ether.

J.5 Double Slit Experiments as a Function of this New Theory

Again, matter (electrons and protons) and energy (photons) are constructed only from fields, which exist over a volume of space, moreover, not with regard to a specific point relative to space (ether). This effect explains the outcome of the double slit experiments, pertaining to the dual waveform/particle nature light (EMR).

This is because the spread-out radiating **fields** of EMR, which are also waves, traverse through both slits simultaneously. Moreover, after this single wave passes through, it then functionally becomes two separate interacting waves (fields). As a result, at the detector surface, they interfere with each other to form an interference pattern. Where the interference of the two waves possesses sufficient energy to affect

a quantum jump of an electron (field) in one of the detector's orbital shells, it turns bright, and where it does not, it remains dark. The resulting alternating pattern located at the detector is interpreted as wave.

In contrast, when there is only one slit, after the EMR passes through, it still is a single wave, so at the detector's surface, no interference pattern forms. Again, the detector only turns bright if that single wave (field) possesses enough energy to produce a quantum jump of an electron (field) in one of its orbital shells. Otherwise, it remains dark. This outcome occurs at only one specific location with respect to the detector's surface and is perceived as a particle, even though there is no particle, only fields.

As an aside, relevant to all that exists (EMR, electrons, protons, etc.), besides the ether, there are only fields, moving fields (waves) quantum entanglement, and quantum interactions. What is more, there is no particle. Given that basic assumption, then with reference to the dual particle/wave double slit experiment, contemplate this.

- The wave function of QM (the →mathematical probability/distribution← of a single-point-like particle simultaneously existing at different locations relative to an overall region) is somewhat equivalent to the actual physical spread-out field/fields of the →photon/electron/proton← (the field/fields are actually physically present/distributed over a given area all at once).

- The interaction of a part of that overall field, at a specific point location, with the field (electron) in the shell of the detector corresponds to the collapse of the waveform, then defined as observed.

1. Given that above, postulate this. As the source photon/electron, etc. passes through both slits simultaneously (because there are only fields), it then divides into two separate, opposite, unequal quantum entangled structures (fields). There is a larger fraction and a smaller fraction. This is not like the classic equal opposite quantum-entangled structures (e.g., equal electrons of opposite spin).

2. The entanglement of the unequal entities produces the interference pattern at the detector's surface—then defined as a wave.

3. On the other hand, whenever one of two “unequal entangled fields” interacts with a measuring/recording device other than the detector (prior to the detector—again defined as disturbed/observed), the entanglement then ceases (decoherence). If this occurs, the interference pattern vanishes. This is because, at that time (after being observed by other than the detector), if either of the two or both of the now-untangled, unequal field/fields still exist, moreover, possess enough energy to effect a quantum jump of a field (electron) in a shell of the detector, it turns bright, and if not, it remains dark. This function produces at the detector's surface two separate areas of brightness corresponding to the two separate slits (not an interference pattern because there is now no entanglement)—then defined as a particle.

So when endeavoring to comprehend the double slit dual particle/wave experiment →think only of extremely complex interactions← of fields, moving fields (waves), quantum interference pattern, and quantum interactions—again, there is no point-like particle.

J.6 Matter and Its Interaction with EMR as a Function of the Ether

At this juncture, let us describe what happens when EMR (a photon) interacts with an orbiting electron of an atom/molecules. Essentially, the EMR adds energy, or in other words, orbital velocity to that electron, both relative to its own nucleus and with respect to the ether (PFSRT). Now, if the electron's increased orbital velocity is sufficient to achieve a new equilibrium configuration, then it jumps into the next outer shell. What this signifies is that relative to the ether, the outer shell electrons possess a greater velocity compared to the inner shell electrons, and as a result, a larger magnetic field. For that reason, and for that electron, there is then increased relativistic inertial mass. Moreover, given that the outer shell electrons possess a larger magnetic field, then by necessity, the shells must progressively become wider/more volumetric the further from the nucleus. Additionally, generally, there are more electrons per shell in the outer shells compared to the inner shells. So, this is a part of the equation as well.

Conversely, if an outer shell electron falls back into a lower inner shell, with an ejection of a photon (field), its magnetic field then decreases; as such, it gives up some of its relativistic inertial mass/velocity relative to ether.

EMR in one of its forms exists as a discrete unit called a photon or quanta. For example, electrons and protons are produced from given energy packets of EMR and vice versa. Additionally, when EMR is absorbed by one of an atom's electrons or alternatively is emitted, this can only occur if the energy

(velocity) added/lost is sufficient to produce a new equilibrium state, defined as a quantum jump. What this indicates is that all chemical reactions are, in fact, quantum interactions. So, the packet form of EMR (photon) is a function of the quantum nature of the atom.

On the other hand, EMR in another of its forms exists as an uninterrupted wave of any wavelength, frequency, and amplitude. For instance, a free electron persistently vibrating with respect to space (ether) generates a continuous electromagnetic wave devoid of packets called photons.

Fundamentally, the point of this last mental exercise is that EMR can exist as a continuous wave of fields or as a discrete length of fields, then called a photon.

J.7 Acceleration of the Electron as a Function of the Ether

Whenever a solitary electron is angularly accelerated or decelerated, it then emits synchrotron/Bremsstrahlung radiation, nevertheless, only for this limited duration of acceleration/deceleration. This new theory posits that it is the interaction of the angularly accelerated/decelerated electron with space (ether) that creates this form of radiation. In contrast, generally when an electron orbits its own nucleus, it undergoes angular acceleration, yet there is no emission of EMR.

Standard physics cannot reasonably explain this conundrum. However, by assuming an ether model, it can be clarified.

For instance, given the proper circumstances, as an outer shell electron orbits, therefore, accelerates, around its own nucleus, it can potentially emit a photon. If so, then simultaneously, it decays into the next inner shell. However, this is assuming it is open and not occupied by another electron. Otherwise, it cannot do so. In contrast, an inner shell electron cannot jump into an outer shell without the input of energy.

To recap, as a function of orbiting its own nucleus, an outer shell electron undergoes angular acceleration. Moreover, in doing so, it can potentially emit EMR (photon) akin to the example of a solitary accelerated electron (e.g., cyclotron). If this occurs, then it drops down into a lower shell, with a lower energy/velocity. However, notice this: by assuming no open lower shell, the electron is blocked from this pathway. So in that setting, it does not emit EMR. Therefore, in the scenario where the atom exists in its lowest energy state, it cannot spontaneously emit photons as the electrons orbit (acceleration) around their own nucleus.

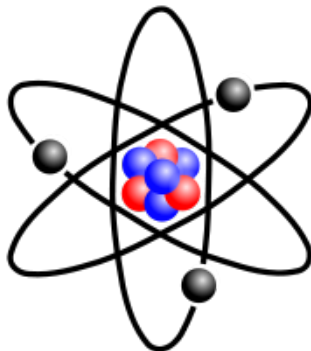
In summary, this conceptualization gives explanation to the reasoning for why an electron, while orbiting its own nucleus, does not in all instances produce EMR, analogous to the scenario of a solitary angularly accelerated electron. Additionally, it explains why an atom tends to spontaneously decay into its lowest electron orbital energy configuration. This model is only a very simplified version of what really transpires, given the fact that the atom possesses an extremely complex internal structure.

J.8 The New QM Theory vs. the Classic QM

This new QM model is analogous, although not identical, to classic QM, for there are numerous similarities, as well as differences, some of which are ascribed below.

A. Referring to QM, the specific properties are present only when observed, whereas with regard to the new theory, the properties are intrinsic to its own structure, moreover, not dependent upon the observer.

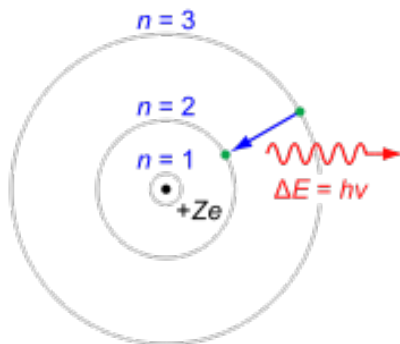
B. Both this new theory and QM involve quanta as depicted in figures J.7 and J.8 below. However, unlike QM, the quanta of this new theory are all a function of the ether.



Wikipedia

Figure J.7 Electrons and Protons of an Atom are Derived from Discrete Packets of EMR (fields). [Fair Use]

All of the electrons (fields) and protons (fields) that make up an atom are derived from discrete packets of EMR (photons or quanta). The atom forms due to complex equilibrium interactions involving electric and magnetic fields, which are only stable at specific configurations. Discern that these interactions are all quantum in nature, moreover, all quanta are ultimately derived from the ether.



Wikipedia

Figure J.8 Emission of a Photon [Fair Use]

As the electron (field) drops from the outer shell into the middle shell equilibrium state, it surrenders some of its magnetic field in the form of an emitted packet of EMR called a photon. Furthermore, because the electron's orbital velocity relative to the ether then diminishes, its relativistic inertial mass also decreases. Again, observe these are all quantum interactions; moreover, all quanta are ultimately derived from the ether.

C. Assuming the new QM model of energy and matter actually represents fact, perhaps classic QM is only a mathematical working representation of this reality. Nevertheless, QM does not depict actual physical structures or the visual mechanism of their interactions. Essentially, even though classic QM accurately predicts outcomes, it does not precisely describe the actual physical structures of either the atom, or for that matter, EMR. Conceivably, this dichotomy is the rationale for why it is difficult to trans-

late what is essentially the advanced mathematics of classic QM into words that actually make common sense.

Just because we have a mathematical formulae that allows us to calculate and predict properties of an atom, this does not mean that the wave function is a mathematical description of the atom or, worse still, that the waveform is the atom. (Quantum: A Guide for the Perplexed, pg. 80, by Jim Al-Khallili)

Conclusion

Quantum mechanics (QM) effectively predicts the outcome of particle physics and subatomic physics with extreme accuracy. In addition, it is the basis for countless successful modern-day inventions. Therefore, it describes the true function of the microworld, nevertheless, strictly mathematically, not structurally in three-dimensions. On the other hand, this new theory is a visual model of that same microworld. Fundamentally, both theories describe the exact same outcome; one mathematically, whereas the other visually. So, presupposing one could describe the new theory with the use of mathematics, the same cause-and-effect relationships would emerge. And so, at that time, it would be equivalent to classic QM. In practicality, classic QM has been so successful/practical/profitable that in the author's opinion, it will be extremely difficult to overturn, moreover, replace. Nevertheless, the major advantage with reference to this new theory is this: If one can visualize the actual cause and effect interactions three-dimensionally, then one ought to then be able to conceive of new and novel ideas, and as a result, build new inventions never before contemplated.

APPENDIX K

ATOMIC CLOCKS, THE VELOCITY OF LIGHT AND THE EGF, ECF (ETHER)

In this appendix, all theories are based on the assumption that the Earth-Centered Non-Rotating Inertial Frame/gravitational field/inflow of space is the local preferred frame for the speed of light on Earth, as well as the local preferred "rate of time" frame on Earth. Everything else depicted in this section derives from this basic assumption. Keep in mind that all three terms are synonymous. Additionally, it should be noted that the term "Inflow of Space" (ether) as defined in Chapter 2 of *The Ether* is new and not generally accepted by mainstream physics. Therefore, for ease of understanding, generally, although within this chapter not exclusively, the author will use the phrase "Earth-Centered Non-Rotating Inertial Frame" (ECF) or the Earth's Gravitational Field (EGF).

The intent of this appendix is to demonstrate how both the rate of time (atomic clocks) and the velocity of light interact with the ECF/EGF in such a way as to maintain the →perception← that the speed of light is c relative to the observer.

In order to calculate the velocity of light by means of two atomic clocks, by necessity they must initially be synchronized at the same location, and subsequently, separated from one another. This determination is a function of the physical distance between the two clocks, correlated to the time interval traveled by the light between emission and detection.

However, as already stated, what many scientists overlook is that the ECF, EGF is the local preferred frame for both the velocity of light as well as the rate of time on Earth, furthermore, as to how this dual function affects the outcome of that measurement.

In addition, recall the EGF does not rotate along with the Earth's axial spin velocity. Furthermore, remember, the greater an object's velocity, relative to the EGF (ether), the slower the rate of time (Hafele and Keating).

So given the postulates as just presented, if the two atomic clocks are synchronized at one specific location on the Earth's surface, and remain there, they stay synchronized. In contrast, if they are then separated, they de-synchronize. The following descriptions depict the reason why.

Assume, as Hafele and Keating established, that the EGF is the local preferred frame for the rate of time on Earth. Additionally, presume the two clocks are synchronized relevant to the exact same mid-latitude point on Earth. Now, so long as they are together, they remain synchronized, because both clocks travel along with the Earth's axial spin at the same velocity vis-à-vis the EGF.

In contrast, after synchronization, if one clock is transported directly eastward for a given distance, then during that motion, its velocity relative to the EGF increases, so its "tic rate" decreases. Now, after the separation is completed, the east clock is once again at rest with the rotating surface of the Earth. So at this time, the tick rates are now equal. However, that clock is now desynchronized relative to the stationary clock. There is now a "time lag" of the east clock compared to the stationary clock.

Alternatively, if one clock is transported directly westward for a given distance, then during that motion, its velocity relative to the EGF decreases, so its tic rate then increases. Now, after the separation is completed, the west clock is once again at rest with the rotating surface of the Earth. So, at this time, the tick rates are now equal. However, the west clock is now desynchronized compared to the stationary clock. There is now, in this case, a "time advancement" of the west clock compared to the stationary clock.

Here is where it gets complex. But first recall the EGF is the local preferred frame for both the velocity of light and the rate of time on Earth.

Presuppose that the stationary clock emits light towards the clock that was transported eastward. So, as a function of the Earth's eastward axial spin velocity within the EGF (ether), it takes light more time to reach that clock, because it travels a greater distance through the ether (ECF). But remember, there is a time lag of the east clock compared to the stationary clock. As a result, the two functions negate one another in such a way that the velocity of light remains at c relative to the observer.

Alternately, presume that the stationary clock emits light towards the clock that was transported westward. In this instance, as a function of the Earth's eastward axial spin velocity, within the ether (EGF), it takes light less time to reach that clock, because light travels a shorter distance through the ether (ECF). But recall, there is a time advancement of the west clock compared to stationary clock. So, the two effects negate one another, and the velocity of light once again remains at c relative to the observer.

Recognize, regarding this example, the rate of time and the velocity of light always interact together, vis-à-vis the EGF, in such a way as to maintain the observer's discernment that the velocity of light is c . However, this \rightarrow perception \leftarrow of c is actually not relative to the observer but rather is a function of the ether (EGF).

The next section illustrates how the EGF, ECF effect an atomic clock's rate of time. The website below contains a video describing an experiment supporting the concept that the "rate of time" of an atomic clock is a function of its velocity relative to the Earth-Centered Frame (EGF) just like the Hafele and Keating experiment.

<https://www.youtube.com/watch?v=G-7ImOWnxQ8>

However, it is a more precise experiment. Nonetheless, the author of the website describes the experiment as a function frame dragging. Alternatively, it is this author's opinion that his conclusion is an erratum. The experiment actually demonstrates differential "time dilation" of an atomic clock as a function of its velocity relative to the Earth-Centered Frame/Gravitation Field/ Inflow of Space/Ether.

As a corollary, an atomic clock positioned at the equator ticks slower (1,000 mph relative to the EGF, ECF, ether) compared to an identical atomic clock located at a higher latitude ($< 1,000$ mph with respect to the EGF, ECF, ether). This outcome is a function of their different velocities relative to the non-rotating ether (EGF, ECF).

Again, referring to this concept, as a thought experiment, which could actually be implemented, assume two atomic clocks are synchronized at one location on the Earth's equator. Next, transport one clock

directly north to a mid-latitude position. During this motion, the transported clock will de-synchronize with the equatorial clock. Nonetheless, it is not that simple for the following reasons. The velocity of the surface of the Earth at the equator, relative EGF is 1,000 mph, but up north < 1,000 mph, let's say for purposes of this example 500 mph.

The actual northward motion of the transported clock produces a time lag compared to the equatorial clock. However, the northern clock possesses less velocity, vis-à-vis the EGF, than the other clock. Therefore, its "tic rate" is faster than the equatorial clock. So, when both clocks are in place, their tic rates then differ, moreover, the de-synchronization increases over time. This divergence and differential tic rate could be measured by an orbiting satellite as portrayed in the above website.

This last section describes a variation of the MMX, which could actually work. Presuppose that the velocity of light is measured over a given distance with the use of one atomic clock and a mirror, a two-way speed of light experiment. The light is emitted from the position of the clock, travels to the mirror, and subsequently, is reflected back to the same clock, where it is detected. The time interval correlated to the distance gives the velocity of light. If the EGF is the preferred frame for light, then just like the MMX, there ought to be a time difference depending on whether the experiment is oriented N-S, S-N (cross-wind arm of the MMX) or E-W, W-E (to-and-fro arm of the MMX).

Unlike the MMX, whereby from the frame of the half-silvered, anti-symmetrical/anti-asymmetrical compensatory changes of wavelength, as a function of reflected/returning light beams renders the experiment silent as to whether or not the ether exists (as classically performed/interpreted), this somewhat analogous experiment can prove whether or not it exists. Nevertheless, there is one caveat. The author does not know if atomic clocks are sensitive enough to make this determination.

In conclusion, both the rate of time and the velocity of light interact with the EGF (ether) in numerous ways, which in some cases →mimics← the notion that the speed of light (c) is always relative to the observer, but in other instances proves that both the velocity of light and the rate of time are actually a function of **the ether** (EGF).

APPENDIX L

ADJUNCT TO EPILOGUE OF CHAPTER 3

Appendix L is an adjunct to the epilogue of Chapter 3. Before evaluating this appendix, please review that chapter, especially the alternative explanation (hypothesis) of the MMX involving opposing counteracting *anti-symmetry* of the returning wavefronts of the two arms from the frame of the half-silvered mirror, thus preventing a fringe shift during rotation. This appendix is divided into four subsections as imparted below.

1. The classic/standard incorrect *theory* of the interpretation of the MMX, as well as the original proposed alternative *hypothesis* as presented in Chapter 3, whereby for the latter, there are opposing counteracting **anti-symmetrical** wavefronts of the two arms, from the frame of the half-silvered mirror, thus preventing a fringe shift during rotation.

2. A second alternative proposed *postulate* described in Chapter 3, wherein counteracting **anti-asymmetrical** opposing wavefronts, in the two arms, from the frame of the half-silvered mirror, produce an interference pattern, moreover, with a fringe shift during rotation. However, the magnitude of this shift is significantly less compared to classic/standard incorrect *theory* of the AMX. Accordingly, it can be differentiated from that classic explanation. →The postulate is most likely the correct and true idea/notion/function←.

3. Potential experimental tests relevant to the different theories.

4. Conclusion.

L.1 The Standard Classical Theory and the Original Proposed Alternative Postulate of Chapter 3

Again, before reading this subsection, a perusal of Chapter 3 is recommended. A review of the pertinent portions of Chapter 3 is now presented.

The original classic MMX theory and the proposed anti-symmetrical alternative hypothesis as presented in Chapter 3 are not easily visualized. For if they were, the alternative hypothesis would not have been so easily overlooked. For that reason, a detailed explanation of those concepts is now provided as offered below in Figure L.1 and the following dissertations. Assume in all the following examples, equal physical lengths of the arms.

A. First, the proposed hypothesis will be re-explained.

B. Second, the classic incorrect theory and comparison with the hypothesis.

A. Re-explanation of MMX Proposed Hypothesis

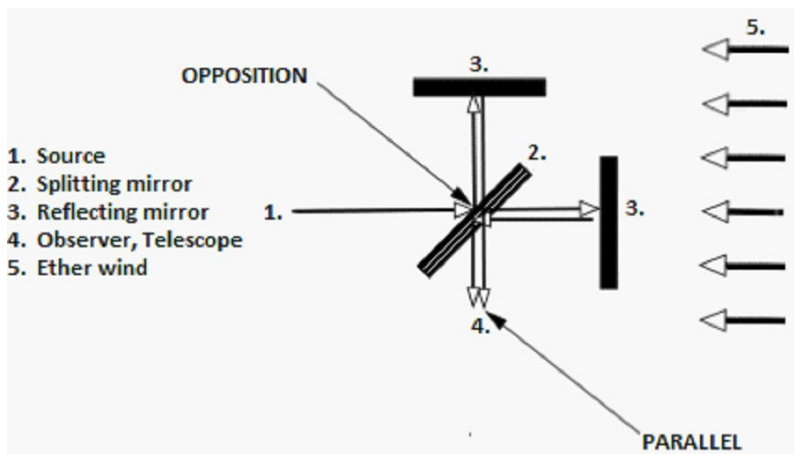


Figure L.1 Explanation of MMX Concepts [Fair Use]

Proposed correct hypothesis—Figure L.1

A single beam of light is emitted from the source (1). This light beam is then divided into two separate streams by the half-silvered mirror (2). They then travel to the peripheral full mirrors (3). Subsequently, the full mirrors then reflect the beams back to the half-silvered mirror. Here is the crucial point. When the returning reflected light beams first intersect, then interact (interface), at the half-silvered mirror, moreover, at a right angle, this is where the interference pattern is first formed. This interaction is a function of two light beams traveling in physical opposition—not mathematically parallel as a function of time. So, from the reference frame of the half-silvered mirror and during rotation, as one light beam progressively gains wavelengths (distance*), while the other beam symmetrically, progressively loses an equal number of wavelengths (distance*), then the interface of the two waves remains unchanged. This means the interference pattern also remains unaffected. In essence, during rotation, the (distances*) change, but the interference pattern does not. Then, from the half-silvered mirror to the detector (observer), the two beams physically travel parallel in the same direction. Moreover, they are fixed relative to one another, since at this time, they both are traveling through the same ether (distance*). Given all of the above, then as a function of the rotation (MMX), even in the face of the ether wind, there is no fringe shift.

B. Comparison of The Classic Incorrect Theory with the Proposed New Hypothesis

The next two figures with their following captions depict the classical, although incorrect, theory of the MMX (Figure L.2) followed by the proposed correct hypothesis (Figure L.3).

The Figure L.2 depicted below denotes the classic incorrect parallel theory.

*Parallel (time) interacting light waves
(incorrect interpretation)*

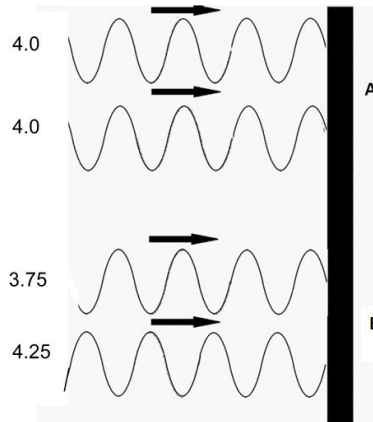


Figure L.2 Incorrect Theory of the MMX

→There is a fringe shift between A and B←.

- Assume an ether wind with equal physical lengths of the arms.
- (Distance*) = distance of the light through the ether = interval of time.
- A - Top 45 degrees relative to the ether wind.
- B - Bottom 0 or 90 degrees relative to the ether wind.
- Vertical rectangular bar represents the observer/detector.
- Take note, relative to 45 degrees vs. (0 degrees or 90 degrees), there is anti-symmetry (gain vs. loss) of the number of wavelengths with respect to the two arms. However, for simplicity of explanation, only one symmetry is shown in this figure.
- The figure depicts parallel waves but only as a representation of time with respect to the equations of the MMX.

Incorrect Parallel Interpretation—Defined as the Theory—Figure L.2

Figure L.2 as represented above is the classic/standard incorrect theory of the function of the MMX. The assumptions presented are false. Therefore, the physics described below is then incorrect. Classically, it is assumed, relative to the two arms, that the interference pattern is formed at the detector (observer) as a function of two interacting parallel waves, traveling in the same direction their entire (distances*); however, parallel only expressed mathematically as a function of time in the MMX equations.

- Position A. (45 degrees) At this position, the two light waves are in-phase, since with respect to the two arms, the "intervals of time" (distances*) are equal.
- Position B. However, after rotation from 45 degrees, at 0 or 90 degrees (B), they are out of phase, since in this setting, relative to the two arms, the time intervals (distances*) are unequal. Therefore, an interference pattern forms.

The interference pattern forms, because during rotation, one wave gains an interval of time (distance*), while the other wave loses an interval of time (distance*). This process then reverses itself every 90 degrees. As a result, over 360 degrees of rotation, at the location of the detector, a fringe shift is produced

in the form of a sinusoid. All of this is assuming, relative to the two arms, that the two light waves are traveling parallel (expressed as time in the MMX equations) in the same direction their entire (distances*), then recombine at the location of the detector (observer). Both assumptions are false.

→Bear in mind that the gain versus the loss of wavelengths between 45 degrees compared to 0 or 90 degrees is not numerically equal as shown in the figure above but rather unequal. However, for simplicity of visual appreciation presented as equal (gain vs. loss). This alteration does not change the underlying principle as illustrated←.

The Figure L.3 depicted below again represents the proposed hypothesis.

***Opposing interacting light waves
(correct interpretation)***

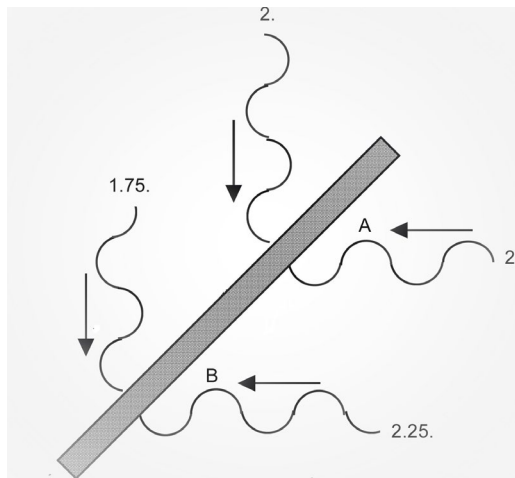


Figure L.3 Proposed Correct Hypothesis [Fair Use]

There is no fringe shift between image A and image B.

- Assume an ether wind with equal physical lengths of the arms.
- Slanted rectangular bar is the half-silvered mirror.
- (Distance*) = distance of the light through the ether.
- Top A = 45 degrees relative to the ether wind. The two waves (vertical and horizontal) are in phase at the half-silvered splitting mirror with equal (distances*) in both arms.
- Bottom B = 0 or 90 degrees relative to the ether wind. The vertical wave loses a 0.25 wavelength and the horizontal wave gains 0.25 wavelength Therefore, at the half-silvered mirror, the two waves are still in phase even though the (distances*) in the two arms have changed.
- Again, relative to 45 degrees vs (0 degrees or 90 degrees), there is anti-symmetry (gain vs. loss) of the number of wavelengths with respect to the two arms. Nonetheless, for simplicity of explanation, only one symmetry is shown in this figure.
- The opposing waves, as shown above, are a function of the two light waves traveling to their respective peripheral mirrors and then both reflected back to the half-silvered mirror where the interference pattern then forms. However, with respect to this figure, only the reflective returning segments are shown.

Proposed Original Correct Interpretation—Defined as the Hypothesis—Figure L3

Figure L.3, as illustrated above, is the proposed correct hypothesis of the function of the MMX. Note that the assumptions posited are only assumed to be true; therefore, the physics described below is only presumed to be correct. In reality, the two streams of light waves, after being reflected from the peripheral full mirrors, are then physically traveling towards one another in opposition at a right angle. Their wavefronts initially intersect, moreover, interact, at the half-silvered mirror to form the interference pattern. Then, from the half-silvered mirror to the detector, they are fixed physically parallel relative to one another, even during rotation.

Now assume there is rotation of the MXX. If the two light waves are traveling in opposition (Figure L.3) and if one wave progressively gains (x) number of wavelengths (distance*), whereas the other wave \rightarrow symmetrically \leftarrow progressively loses an equal number of wavelengths (distance*), then at the true location of the interacting wavefronts (half-silvered mirror), there is no change in their interface. For the same reason, during rotation, there is no fringe shift (dimming), since this anti-symmetrical compensatory function prevents it. As a result, the configuration of the two interacting wavefronts at the location of the half-silvered mirror then remains unchanged. During rotation, the (distances*) change, but the interface of the two opposing waves does not. So, if the interface does not change, then neither does the interference pattern; therefore, there is no fringe shift. Additionally, from the half-silvered mirror to the detector or observer, the two waves travel physically parallel in the same direction, moreover, are fixed relative to one another, because at that time, both waves travel through the same ether (distance*). Therefore overall, relative to the detector (observer), during rotation, no fringe shift is observed.

In the real world, the physical lengths of the arms of the MMX are not absolutely equal relative to a single wavelength of light. So, in truth, at 45 degrees, an interference pattern forms, but only as a function of the unequal physical length of the arms. Then, during rotation, the anti-symmetrical counteracting process just described prevents a fringe shift.

To recap, the interference pattern is formed where the two returning opposing wavefronts first intersect, which is at the location of the half-silvered mirror. These right-angled intersecting waves are traveling in physical opposition not parallel (time in the MMX equations). So, during rotation (top to bottom), one light wave gains 0.25-wavelength (distance*) while the other wave loses 0.25-wavelength (distance*). Therefore, there is no change in the interface, so no interference pattern or fringe shift. See Figure L.3.

Once again, for the novice, Figure L.4, as well as figures L.5, L.6, and L.7 below, demonstrate, in the presence of an ether wind, that during the rotation of the MMX, due to the opposing anti-symmetrical counteracting function just described, where a gain of the number of wavelengths (distance*) in one arm is associated with an equal loss of number of wavelengths (distance*) in the other arm, no fringe shift occurs. Observe, at 45 degrees, the (distances*) within both arms are the same, assuming equal physical lengths of the two arms. This explains position A in the previous figures. But, remember, in the real world, the physical lengths of the arms are unequal when compared to a single wavelength of light. As a result, in truth, at this position (45 degrees), the (distances*) are unequal, although only as a function of the different physical lengths of the arms. The underlying rationale for why the author chose to assume equal physical length of the arms is for simplicity of explanation.

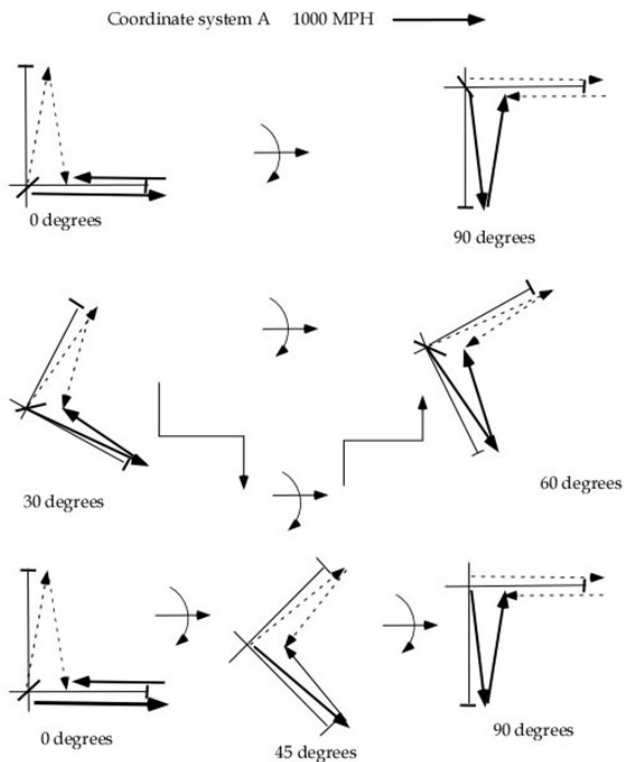


Figure L.4 Stable Interference Pattern Regardless of Ether Wind

Assume an ether wind 1,000 mph from left to right.

Presume equal physical length of the arms. So, at 45 degrees, the (distances*) within both arms are then equal. **Observe during rotation of 0 to 90 degrees.**

- The dotted (distance*) exchanges places with the solid (distance*).
- Or the total number of wavelengths within the dotted arm exchanges places with the total number of wavelengths within the solid arm.
- Or the gain in the number of wavelengths within the dotted arm is symmetrical with the loss in the number of wavelengths within the solid arm.

The opposing anti-symmetry function of the number of wavelengths then produces, during rotation, at the location of the half-silvered mirror, a stable interference pattern, regardless of whether or not there is an ether wind.

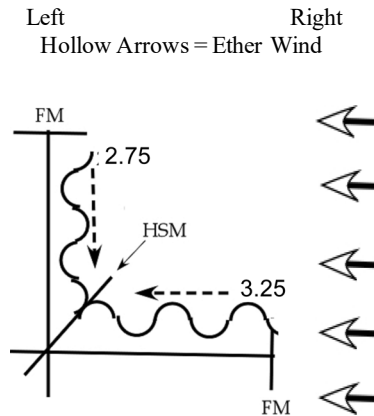


Figure L.5 0 Degrees Relative to the Ether Wind

*N-S E-W
MMX is rotating clockwise.*

- The (distance*) with respect to the to-and-fro arm is greater than the crosswind arm.
- At 0 degrees the two light beams at the interface (half-silvered mirror) are in phase. **At 0 degrees, assuming an ether wind and presuming equal physical lengths of the arms, then the wavefronts at the half-silvered mirror are always in phase, moreover, in all orientations. See discussion after Figure L.7.**
- The opposing waves shown are a function of the two light waves traveling to their respective peripheral mirrors and then both reflected back to the half-silvered mirror where the interference pattern then forms. However, with respect to the above figure, only the reflective returning segments are shown.

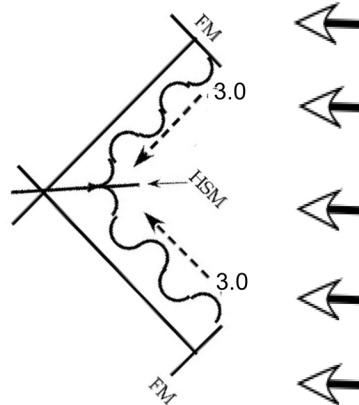


Figure L.6 45 Degrees Relative to the Ether Wind

The (distances) within each arm are now equal to each other. Nevertheless, the two light beams at the interface, (half-silvered mirror) are still in-phase. This is a function of a gain of a quarter of a wavelength in one arm and a loss of a quarter of a wavelength in the other arm. There is no fringe shift.*

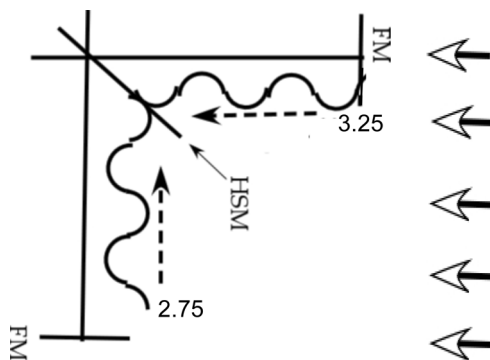


Figure L.7 90 Degrees Relative to the Ether Wind

The (distance*) with respect to the to-and-fro arm is greater than the crosswind arm. But now when compared to 0 degrees, the two arms have exchanged places. The two light beams at the interface (half-silvered mirror) are still in-phase. Again, this is a function of a gain of a quarter of a wavelength in one arm and a loss of a quarter of a wavelength in the other arm.

Therefore, even though, as a function of rotation, the (distances*) change, the interface does not. And, if the interface does not change, then there is no interference pattern. For that reason, there is no fringe shift during rotation. Even in the presence of an ether wind, the MMX is silent as to whether or not it exists.

Observe in Figure L.6, one can readily visualize at 45 degrees that the (distances*) with respect to both arms are identical, assuming equal physical lengths of the arms. Therefore, in this case at the location of the half-silvered mirror, the two light waves are in-phase, so no interference pattern forms (no dimming).

However, it is somewhat more difficult to envision at 0 and 90 degrees (figures L.5 and L.7) how, during rotation, counteracting anti-symmetry of opposing wavefronts in the two arms at the location of the half-silvered mirrors, prevents any change in those in-phase opposing wavefronts, even though the (distances*) have changed. Again, there is no dimming (fringe shift) even during rotation.

What all this indicates is that if the physical lengths of the two arms are absolutely equal, there is no interference pattern independent of rotation (no dimming). The interference pattern is only/purely a function of unequal physical length of the two arms (when present), relative to the distance of a single wave of light (wavelength) that is used—essentially a nonapparent Kennedy-Thorndike interferometer.

So then, presuming an unequal physical-length arm scenario at 45 degrees, as well as during rotation, and at the location of half-silvered mirror, there is, in this second scenario, no change in the now-observed interference pattern because of the anti-counteracting function as already described. What this means is the interference pattern is only a function of the unequal length of the physical arms relative to a single wavelength of light used, more importantly, not related to the ether wind.

In conclusion, all that depicted above is based on the assumption of counteracting opposing **anti-symmetrical** changes in wavefronts (distances*) from the frame of the half-silvered mirror.

Summary

The classic interpretation of the MMX perceives the experiment from the reference frame of the detector (observer) as a function of the "amount of time" it takes for light to travel through the ether, relative to each arm. This interval of time is then mathematically correlated to the (distances*), involving two **parallel** light beams, traveling in both arms in the same direction. In fact, they are not traveling parallel their entire (distances*), but mathematically expressed as a function of time with respect to the MMX equations, they are.

The incorrect interpretation is related to the following.

1. Relative to each arm, "time" is a function of (distance*) (true). However, the (distances*) could be traveling mathematically (time) parallel (false) or in physical opposition (true).
2. The origin of the interference pattern is located at the detector/observer (false).
3. This is the location where the two interacting waves travel physically parallel with respect to each other (true).
4. The origin of the interference pattern forms at the half-silvered mirror (true). This is the location where the two waves travel in physical opposition with respect to each other (true).
5. During rotation, the two parallel waves (mathematical time), shift back and forth relative to one another, therefore, producing a fringe shift at the location of the detector (false).
6. During rotation, at the location of the half-silvered mirror, the interface of the opposing light waves remains fixed as a function of counteracting anti-symmetry (true).

In contrast, the proposed correct interpretation (hypothesis) perceives the MMX outcome from the reference frame of the half-silvered mirror. Therefore, relative to each arm, during rotation, as a function of two **opposing**, moreover, anti-symmetrical counteracting wavefronts the (distances*) change; however, the interface remains constant. Consequently, there is no fringe shift even in the presence of an ether wind.

For all these reasons, the MMX is silent as to whether or not the ether exists. The MMX is incapable of detecting the ether wind. Voila! There you have it.

From another perspective:

1. First assume equal physical length of the two arms, additionally an ether wind. Therefore, during rotation, the anti-symmetrical counteracting function just described, from the frame of the half-silvered mirror, prevents an interference pattern. So even during rotation, the two separate interacting waves remain in phase. Accordingly, during rotation, there is also no interference pattern, moreover, no fringe shift.

2. If the two light waves are out of phase, in this case, only as a function of unequal physical length of the arms, there is now an interference pattern, but during rotation no fringe shift. With reference to this second scenario, the interference pattern is based exclusively upon the unequal physical length of the arms. Additionally, during rotation, the counteracting function just described from the frame of the half-silvered mirror, prevents any change in that specific interference pattern. So even during rotation there is no fringe shift; the interference pattern remains stable.

3. Assuming there is no ether, once again as a function of rotation, there is no fringe.

4. Given the fact that it is almost impossible to construct an MMX such that the two arms are perfectly equal relative to a single wavelength of light, as such, then all MMX are, in fact, non-apparent Kennedy-Thorndike experiments which is actually the second scenario as described above (2).

II. A Second Alternative Postulate Theorized in Chapter 3 (most likely the correct concept)

The author is absolutely convinced the interference pattern of the MXX is formed at the location of the half-silvered mirror and not from the frame of the telescope. It is observed at the telescope but not formed there. Nevertheless, the author does not possess the mathematical skill/knowledge to prove whether or not counteracting changes of the returning opposing wavefronts (distances*) from the frame of the half-silvered mirror are **anti-symmetrical** or alternatively **anti-asymmetrical**. Consequently, this novel theory, as presented, is unproven.

In other words, regarding this alternative original MMX *hypothesis*, all that described in Chapter 3 is totally dependent on the assumption of counteracting opposing **anti-symmetrical** changes of wavelength (distances*) from the frame of the half-silvered mirror; therefore, during rotation, there is no interference pattern and no fringe shift.

On the other hand, what occurs if the counteracting opposing wavelength changes (distances*) from the frame, the half-silvered mirror is **anti-asymmetric** instead of anti-symmetric? In this instance, during rotation, there would now be a fringe shift. However, it would be of a lesser magnitude compared to the parallel wave *theory* (classic interpretation/explanation).

For further clarification see the comparisons below and again →assume equal physical length of the arms, as well as an ether wind←.

A. Incorrect classic **parallel wave theory from the frame of the observer/telescope**

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*) and the other arm progressively loses wavelengths (distance*). The supposed fringe shift would be a function of the \rightarrow sum \leftarrow of these two functions.

B. Proposed correct original **opposing** counteracting **anti-symmetrical** wave *hypothesis* of Chapter 3 from the **frame of the half-silvered mirror**.

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains x wavelengths (distance*) and the other arm **anti-symmetrically** progressively loses x wavelengths (distance*). In this second instance, there is no interference pattern or fringe shift.

C. Proposed alternative correct **opposing** counteracting **anti-asymmetrical** wave *postulate* from the **frame of the half-silvered mirror**.

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*) and the other arm **anti-asymmetrically** progressively loses wavelengths (distance*). In this third instance, the fringe shift produced would be related to the \rightarrow difference \leftarrow between these two functions.

1. Classic/standard theory

Incorrect **parallel** wave theory from the frame of the observer/telescope = fringe shift during rotation.

2. Original proposed correct alternative hypothesis of Chapter 3

There is assumed to be counteracting **anti-symmetrical** opposing waves from the frame of half silvered mirror = no fringe shift during rotation.

3. Proposed second correct alternative postulate

There is assumed to be counteracting **anti-asymmetrical** opposing waves from the frame of the half-silvered mirror = fringe shift during rotation but < the parallel wave *theory*.

What this establishes is that, during rotation, the predicted fringe shift regarding the incorrect parallel wave *theory* would be greater compared to the correct **anti-asymmetrical postulate**. Consequently, supposedly the **parallel** wave theory would be more sensitive compared to the **anti-asymmetrical postulate**.

Bear in mind, presuming the incorrect parallel wave *theory* (mathematics) is utilized to calculate the theoretical expected fringe shift, but the proposed **anti-asymmetrical postulate** is actually observed, then that conflicting result might not be considered as scientifically significant, thus discarded/ignored, accordingly, a presumed false null outcome.

The quandary then is this: without the use of mathematics, which theory/hypothesis/postulate most likely represents reality?

In the author's opinion the interference pattern first forms at the half-silvered mirror from two counteracting opposing wavefronts so the classic *theory* can be discarded. This leaves the **anti-symmetrical hypothesis** and the **anti-asymmetrical postulate** as possibilities. To resolve this dichotomy, the author presents the following five figures with explanations. Yet again, assume equal physical lengths of arms.

First Scenario

Left Right

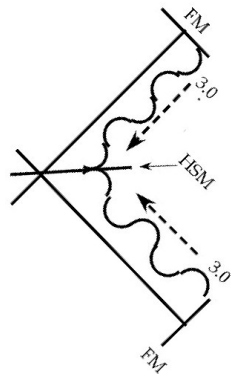


Figure L.8 45 Degrees with no Ether Wind

N-S E-W

A. 45 degrees with no ether wind

Left Right

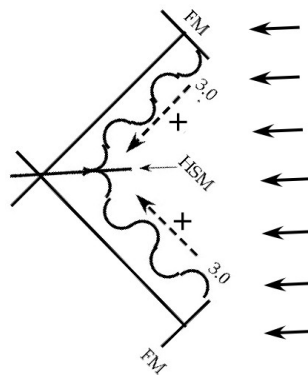


Figure L.9 45 Degrees Relative to the Ether Wind

N-S E-W

B. 45 degrees relative to the ether wind

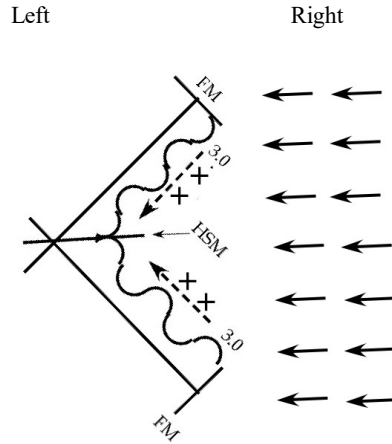


Figure L.10 45 Degrees Relative to a Greater Ether Wind

N-S E-W
C. 45 degrees relative to a greater ether wind

Please review figures L.8, L.9, and L.10. Notice at 45 degrees without an ether wind, the (distances*) within the two arms are equal (see Figure L.8).

Additionally, with an ether wind, regardless of its velocity, whether slower (Figure L.9) or faster (Figure L.10) the (distances*) are still equal in each instance. In all three cases, regarding the opposing wavefronts at the location of the half-silvered mirror, the two waves are in phase; therefore, there is no interference pattern.

Second Scenario

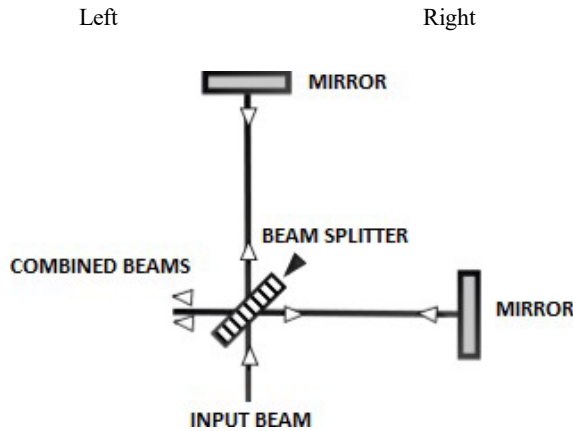


Figure L.11 0 Degrees with no Ether Wind [Fair Use]

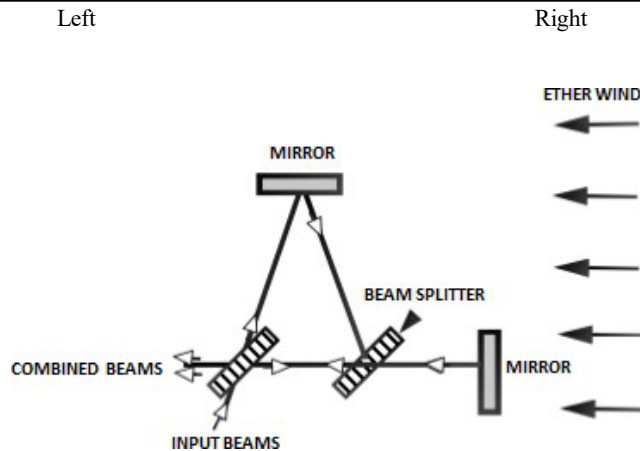


Figure L.12 0 Degrees with an Ether Wind [Fair Use]

Please review figures L.11 and L.12. Notice that at 0 degrees without an ether wind (Figure L.11), the (distances*) within both arms are equal. And so regarding the returning interacting opposing wavefronts from the frame of the half-silvered mirror, the two waves are in phase, consequently no interference pattern.

Alternately, with an ether wind (Figure L.12), the (distance*) within the to-and-fro arm is greater than the crosswind arm. Consequently, regarding the returning interacting opposing wavefronts, from the frame of the half-silvered mirror, the two waves are now out of phase; therefore, an interference pattern occurs.

Please pay close attention for here is a key concept. Scenarios 1 and 2 above are incompatible with one another. And here is the reasoning.

Relevant to Scenario 1, moreover, assuming an ether wind, at 45 degrees, the (distance*) within both arms are equal. Therefore, regarding the returning interacting waves and given the assumption of counteracting **anti-symmetrical** opposing wavefronts, then during rotation, from the frame of the half-silvered mirror, the two waves always remain in phase, even at 0 degrees (see figures L.5, L.6, and L.7. But notice, this outcome is incompatible with Scenario 2 →with an ether wind←, whereby there is an interference pattern at 0 degrees (out of phase—see figures L.11 and L.12).

Alternatively, the two different scenarios/angles (45 vs 0 degrees) could be compatible, assuming counteracting anti-asymmetrical opposing wavefronts from the frame of the half-silvered mirror.

For this reason, it is the author's opinion that the *postulate* of counteracting **anti-asymmetrical** opposing wavefronts is more likely than the **anti-symmetrical hypothesis**. Nevertheless, this belief necessitates a rigorous mathematical proof for validation.

Again, for reinforcement and review:

1. Incorrect Classic Parallel Wave *Theory* **from the frame of The Observer/ Telescope.**

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*), and the other arm progressively loses wavelengths (distance*). The resulting supposed fringe shift would be a function of the →**sum**← of these two processes.

2. Proposed Correct Original Opposing Counteracting **Anti-symmetrical Wave Hypothesis** of Chapter 3 from **The Frame of Half-silvered Mirror.**

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains x wavelengths (distance*), and the other arm **symmetrically** progressively loses x wavelengths (distance*). In this second instance, there is no interference pattern or fringe shift.

3. Proposed Correct Alternative Opposing Counteracting **Anti-asymmetrical Wave Postulate**, from the **Frame of the Half-silvered Mirror**.

At 45 degrees relative to the ether wind, the two waves are in phase. During rotation to 0 or 90 degrees, one arm progressively gains wavelengths (distance*), and the other arm **anti-asymmetrically** progressively loses wavelengths (distance*). In this third case, the fringe shift would be related to the **→difference←** between these two functions. Actually, this is more complicated than the meaning of the word difference; see below.

This is a very intricate concept to visualize as now presented. Fundamentally, the fringe shift would be less than the classic theory. At 0 degrees, the to-and-fro arm (distance*) is greater than the crosswind arm (distance*), but at 45 degrees, they are both equal. In order for this to occur, the crosswind arm must gain fewer wavelengths compared to the loss of the number of wavelengths in the to-and-fro arm—up to 45 degrees. Then, from 45 degrees to 90 degrees the new to-and-fro arm must gain more wavelengths than the loss of the number of wavelengths in the new crosswind arm.

In the author's opinion, the classic *parallel* theory is incorrect; moreover, only the second and third scenarios are potentially correct, either one or the other. Furthermore, they can be experimentally differentiated as spelled out in the following section.

3. Potential Experimental Tests Relevant to the Different Theories

The author proposes the following hypothetical experiments as potential proof of the existence of the ether vis-à-vis the **anti-symmetrical hypothesis** versus the **anti-asymmetrical postulate**. One more time, assume equal physical length of the arms.

First Proposed Experiment

So, assuming the relative ether wind changes velocity between two different reference frames (defined as coordinate systems B and C in Appendix D), a fringe shift occurs as a function of moving from one frame into another one. Examples of two different frames or coordinate systems using the MMX relative to the ECF/EGF would be:

Example 1

A. At the equator, sited on the rotating surface of the Earth, with one arm oriented fixed south/north (S/N) and the other arm fixed west/east (W/E), thus 1,000 mph with respect to the ECF/EGF—a relative ether wind of 1,000 mph.

B. On an airplane, traveling 600 mph, west to east, at the latitude of the equator with one arm oriented fixed S/N and the other arm fixed W/E, therefore, equal to 1,600 mph with respect to the ECF/EGF—a relative ether wind of 1,600 mph.

The two coordinate systems possess different velocities relative to the ECF/EGF, as such, different relative ether winds.

Therefore, if one carries out an MMX "sited" on the Earth's rotating surface, fixed in the S/N-W/E directions (A), and subsequently at the same latitude, in the same mode, on an eastward bound airplane traveling 600 mph (B), then between these two frames, a different interference pattern emerges.

Example 2

Additionally, if one performs the experiment, S/N-W/E, first at the equator, at rest with the Earth's rotating surface, 1,000 mph relative to the ether (ECF), and second at the South Pole, 0 mph relative to the (ECF), there will then again be a disparity in the shape of the interference patterns between these two frames.

The reasoning behind the fringe shift is as follows. As the MMX increases its velocity relative to the ECF, moreover, as in Example 1 fixed and oriented S/N-W/E, there is a gain of (distances*) in both the to-and-fro arm (W/E) as well as the crosswind arm (S/N). But it is proportionally greater in the to-and-fro arm. Consequently, there is a fringe shift as a function of an increasing velocity relative to the ECF using the postulate not the hypothesis.

1. The **anti-asymmetrical postulate** would produce a fringe shift between the two different coordinate systems.

2. The **anti-symmetrical hypothesis** would not produce a fringe shift between two different coordinate systems.

Second Proposed Experiment

Regarding this experiment, relative to the ECF/EGF, one arm is fixed vertically in the upright position perpendicular to Earth and the other arm horizontally, parallel to the Earth's surface rotating, between the cross-wind direction (S-N, N-S) and the to-and-fro wind direction (W-E, E-W).

Consequently, vis-à-vis this experiment, the vertical arm (distance*) is stationary and constant. On the other hand, regarding the horizontal arm, as a direct function of rotation between (S-N, N-S) versus (W-E, E-W), the (distance*) then changes.

This is not the classical revolving motion of the MMX, which as originally performed is parallel to the Earth's surface (both arms). Referring to this new experiment, the rotational motion is along the axis of the fixed upright vertical arm, whereas the horizontal arm is moving parallel to the surface of the Earth (E-W, N-S). So, assuming the new theory is valid (PFGRT), then regarding this alternative mode of the MMX, there should be a fringe shift, as a function of this form of rotation, again proof of The Ether. Take note, in this scenario, there is no counteracting **anti-symmetry or anti-asymmetry** of the wavefronts of the two arms, from the frame of the half-silvered mirror.

As an adjunct, an MMX located inside a satellite in a circular orbit with one arm oriented radial to the Earth's center, whereas the other arm alternating between parallel and transverse relative to its orbital motion, should also produce a greater fringe shift as a function of this form of rotation—again proof of the ether.

1. The **anti-asymmetrical** *postulate* would produce a fringe shift during rotation.
2. The **anti-symmetrical** *hypothesis* would also produce a fringe shift during rotation, nevertheless, a different fringe shift.

Third proposed experiment

One arm is oriented (fixed) parallel to the surface of the Earth and the other arm rotates between parallel and upright (perpendicular to parallel relative to the inflow of the ether).

1. The **anti-symmetrical** *postulate* would produce a fringe shift during rotation.
2. The **anti-symmetrical** *hypothesis* would also produce a fringe shift during rotation, nevertheless, a slightly different fringe shift.

This experiment may well be more accurate within an orbiting satellite. This would eliminate compression changes from gravity regarding the revolving upright arm.

These imaginary tests, if carried out as actual experiments, and if confirmed, would be evidence of a relative ether wind. So, in fact, the MMX can detect the ether wind but not in context as originally performed. The author cannot emphasize this enough. These alternate experiments of the MMX, as described above, and if verified, would then invalidate relativity, furthermore, attest to the existence of the ether.

4. Conclusion

Given all the above, it is the author's opinion that the classic/standard parallel wave *theory* explanation of the MMX is incorrect because the interference pattern does not occur at the telescope/observer but rather at the half-silvered mirror relevant to two counteracting opposing waves fronts.

→Additionally, regarding these two opposing fronts, the **anti-asymmetrical** *postulate* more likely represents the real function of the MMX compared to the **anti-symmetrical** *hypothesis*. Nevertheless, this assumption requires a rigorous mathematical/experimental proof←.

APPENDIX M

OVER-UNITY

Appendix M is divided into three sections:

- M.1. General Introduction.
- M.2. A Simplified Model of an Over-Unity Wheel.
- M.3. The Suppression of Pyridine Shift Scientific Theories and Breakthrough Inventions.

M.1 General Introduction

This appendix provides additional information regarding the subject of over-unity. This term presumes that the output of energy/work is greater than the input of energy/work.

The following is a definition of over-unity obtained online at:

<https://en.wiktionary.org/wiki/over-unity>

Over + unity = referring to the fact that an over-unity device should produce more energy than it receives as input. The term was coined to avoid patent rules that prevent impossible technologies such as perpetual motion machines being patented.

Many diverse individuals/scientists/inventors have avowed over-unity. Nevertheless, given the fact that their claims violate the supposed irrefutable law of the conservation of energy, their assertions are rejected/ignored/ridiculed.

Vis-à-vis the literature/news, there are numerous proclamations of over-unity, but the vast majority are very intricate and complicated, consequently, extremely perplexing to appreciate, if even real. Nevertheless, this appendix posits the concept of over-unity as delineated by the examples provided below.

The Ether,

First Edition Review Copy.

By Ramsey Copyright ©2021 John Chappell Natural Philosophy Society

M.2 A Simplified Model of an Over-Unity Wheel

The author now presents the simplest over-unity designs, the least complicated for the average novice to grasp and visualize as revealed in the following four websites. Please pay close attention, especially to the first website listed.

<https://www.youtube.com/watch?v=rbCnzsFjvQU>

<https://www.youtube.com/watch?v=88Z2x1MEex8>

<https://www.youtube.com/watch?v=rsBplmMDcRQ>

<https://www.youtube.com/watch?v=DsvP1CaiVjI>

The author has decided to make this specific section redundant, not for the sake of the physicist, for he/she will readily understand the concepts presented, but rather to underscore their significance. The author has composed it in this manner for the benefit of the apprentice.

For that reason, the same concepts are presented multiple times and from different perspectives. Hopefully, for the novice, this repetitive methodology will aid in his/her ability to grasp the ideas presented.

Now here is the explanation for the simplest design. See Figure M.1 below and the following description.

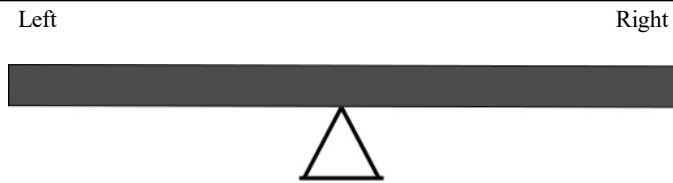


Figure M.1

A uniform flat rectangular board is balanced at its center utilizing a triangular wedge as illustrated, the latter of which represents the fulcrum. There is an equal amount of mass located on either side of the fulcrum, consequently the board is balanced.

See Figure M.2 below.

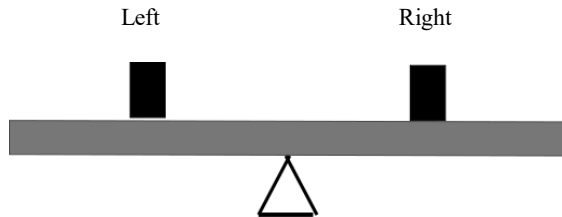


Figure M.2

Then on both sides of the fulcrum, identical/equal masses are placed exactly halfway towards the end of the board on each side. Observe that the entire structure still remains balanced, what's more, overall again, there is equal amount of mass positioned on either side of the fulcrum.

See Figure M.3 below.

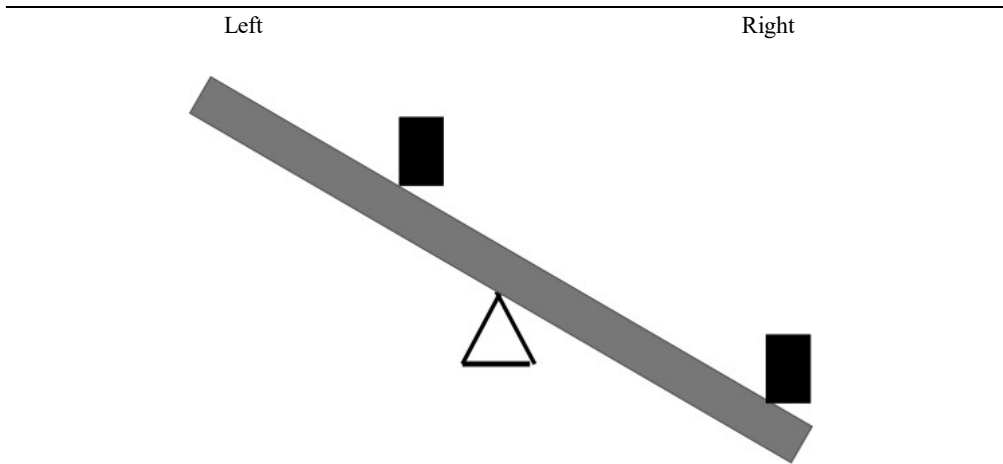


Figure M.3

Next, move the right mass to the end of the board on its side, while leaving the left mass as is. Observe that the board tilts down on the right. (There is now more torque on the right than the left, so the structure slants down on the right.) Discern that there is still equal **overall** mass on either side of the fulcrum; even so, the board is now unbalanced.

→What all this indicates is the center of the gravitational force and the center of balance do not always coincide←.

See definition below.

The three figures depicted above, with their descriptions, are confusing with respect to the classical/standard conception of the center of mass/gravity as explained by the following three quotes and subsequent discussions.

1. *In physics, the center of mass of a distribution of mass in space is the unique point where the weighted relative position of the distributed mass sums to zero. This is the point to which a force may be applied to cause a linear acceleration without an angular acceleration. Calculations in mechanics are often simplified when formulated with respect to the center of mass. It is a hypothetical point where entire mass of an object may be assumed to be concentrated to visualize its motion. In other words, the center of mass is the particle equivalent of a given object for application of Newton's laws of motion. In the case of a single rigid body, the center of mass is fixed in relation to the body, and if the →body has uniform density, it will be located at the center←.* [Center of Mass - Wikipedia]

2. *Mass is defined as "the quantity of matter composing a body." In every object, there is a unique point called "center of mass (CM)" around which the object's →mass is equally distributed in all directions←.* **In other words, mass is balanced at the CM in all directions.**

http://oregonstate.edu/instruct/exss323/CM_Lab/Center%20of%20Mass.htm

→ **Discern the center of mass and the center of gravity are not the same thing. With respect to center of mass, mass is equally distributed on either side of the fulcrum whereas with reference to the center of gravity the mass is not necessarily equally distributed on either side of the fulcrum**←.

3. *If we push on a rigid object at its center of mass, then the object will always move as if it is a point mass. It will not rotate about any axis, regardless of its actual shape. If the object is subjected to an unbalanced force at some other point, then it will begin rotating about the center of mass.*

<https://www.khanacademy.org/science/physics/linear-momentum/center-of-mass/a/what-is-center-of-mass>

In summary, assuming the new inflowing ether premise, as stated in this appendix, is factual, then from the frame of the inflowing ether (gravity), which is the example as given above (figures M.1, M.2, and M.3), the center of balance and the center of gravitational force are not in all cases the same.

For reinforcement, again please review the websites as previously presented on the topic of over-unity. Keep in mind again the center of mass of an object is not the same thing as the center of a gravitational force exerted on an object.

<https://www.youtube.com/watch?v=rbCnzsFjvQU>

<https://www.youtube.com/watch?v=88Z2x1MEex8>

<https://www.youtube.com/watch?v=rsBplmMDcRQ>

<https://www.youtube.com/watch?v=DsvP1CaiVjI>

Observe that (first and last) in each instance, the wheel's pivot is located at the exact center of its **overall mass/gravitational force** (not the definition of the center of mass).

Additionally, on one side of the wheel (right), the mobile/movable peripheral masses shift/fall towards the outer side of the wheel as compared to the opposing side (left). This is a function of gravity or by the terminology of this book, the accelerating factor of the inflow of space/ether. Accordingly, there is then more torque on that side (right) vs. the left. The overall wheel is now unbalanced. Yet the center of gravitational force is still located at the pivot.

The persistent asymmetrical torques, analogous to figures M .1, M .2, and M .3, cause the wheel to continually rotate in the direction of the side with the greater torque (right), moreover, without the classic input of energy/work. But in truth, the apparent over-unity is a product of the continuous accelerating factor of the inflowing ether as hypothesized in this publication titled *The Ether*.

Rotational physics (torque) is distinct from translational physics (Newton $F = ma$).

Force

In physics, a force is any interaction that, when unopposed, will change the motion of an object. (1) A force can cause an object with mass to change its velocity (which includes to begin moving from a state of rest), i.e., to accelerate. Force can also be described intuitively as a push or a pull. A force has both magnitude and direction, making it a vector quantity. It is measured in the SI unit of newtons and represented by the symbol F .

The original form of Newton's second law states that the net force acting upon an object is equal to the rate at which its momentum changes with time. If the mass of the object is constant, this law implies that the acceleration of an object is directly proportional to the net force acting on the object, is in the direction of the net force, and is inversely proportional to the mass of the object. [<https://engineeringunits.com/fma-calculator/>]

This definition refers to only linear or translational motion.

Torque

Torque is a measure of how much a force, acting on an object, causes that object to rotate. The object rotates about an axis, which we will call the pivot point. In other words, torque is the cross product between the distance vector (the distance from the pivot point to the point where force is applied) and the force vector, "a" being the angle between r and F .

Imagine pushing a door to open it. The force of your push (F) causes the door to rotate about its hinges (the pivot point, O). How hard you need to push depends on the distance you are from the hinges (r) (and several other things, but let's ignore them now). The closer you are to the hinges (i.e., the smaller r is), the harder it is to push. This is what happens when you try to push open a door on the wrong side. The torque you created on the door is smaller than it would have been had you pushed the correct side (away from its hinges).

<https://www.physics.uoguelph.ca/tutorials/torque/Q.torque.intro.html>

Observe, this definition refers to only rotational motion.

Once again for emphasis, please refer to Figure M.4 below (a repeat of Figure M.3).

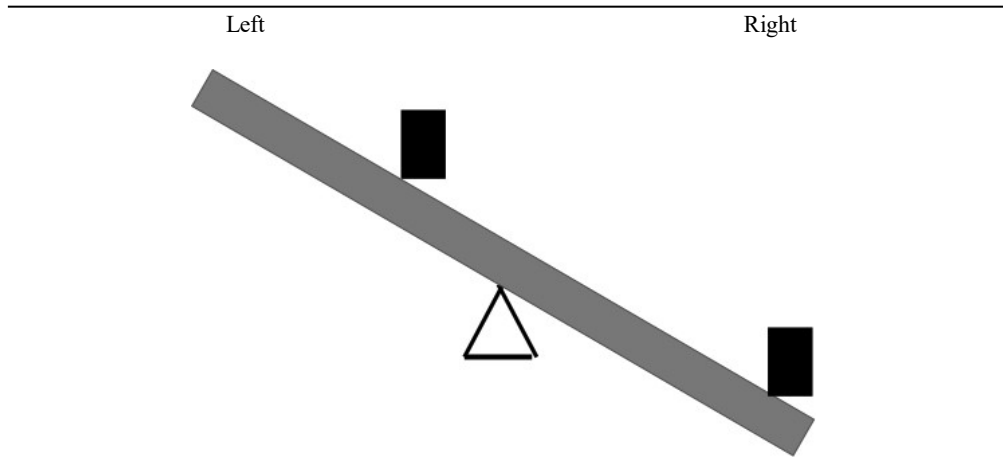


Figure M.4

1. Descriptions are simplified for the novice.
 2. As in Figure M.3/M.4, the center of the overall gravitational force is located at the pivot.
 3. The torque on the right is a function of the gravitational force exerted on the entire mass of the right half of the board plus the force of gravity applied to the peripheral mass (the later located at the end of the board's right side) times the overall sum of all the distances to the pivot. This function produces a given amount of torque at the pivot. (This is a simplified description). Now assume the value of this torque is defined as A.
 4. The torque on the left is a function of the gravitational force exerted on the entire mass of the left side of the board plus the force of gravity applied to the center mass, this time located midway relative to the board's left side, times the overall sum of all of the distances to the pivot. This function creates a torque at the pivot (simplified description). Presume there is a given value of this torque but this time defined as B.
 5. Since the mass on the left is located halfway relative to the end of the board but on the right at the very end of its side, torque A is then greater than torque B.
 6. For that reason, overall, the board with its masses tilts down to the right. (The right half tilts down and the left side slants up.)
 7. Again, please review the definitions of force and torque as just presented.
 8. The force times the **overall mass** is equal on each side of the fulcrum (linear physics = Newton), but the force times distances (torque) is greater on the right (rotational physics).
 9. Rotational physics is what actually occurs.
 10. Accordingly, one cannot use Newtonian physics (linear physics) to describe/understand/explain this example, moreover, derived devices/inventions (see below).
Please refer to figures M.5 and M.6.
- Figures M.5 and M.6 are a picture and a schematic of "Big Perpetuum Mobile," which refers the website cited below. This is the least complicated design to explain/visualize. Please visit and review that site, before reading the following explanation.

<https://www.youtube.com/watch?v=rbCnzsFjvQU>



YouTube "Big Perpetuum Mobile"

Figure M.5 [Fair Use]

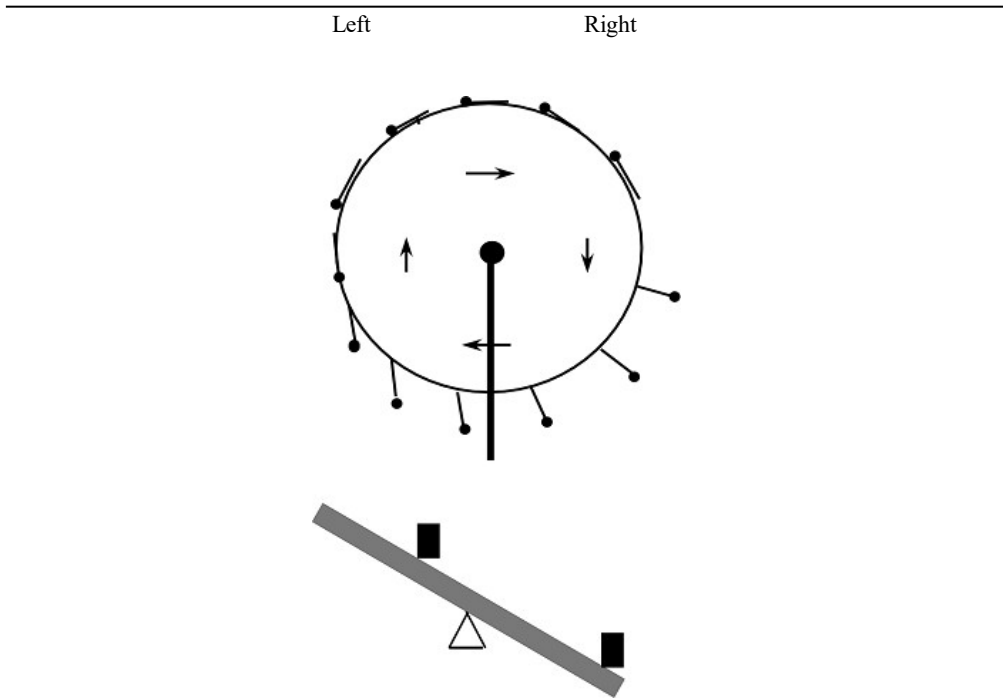


Figure M.6

Upper M.6 is a schematic of Figure M.5. Arrows represent the direction of rotation of the wheel. Lower M.6 is somewhat similar to upper M.6 in that the torque is greater on the right compared to the left.

Explanation of the "Big Perpetuum Mobile" wheel:

1. The center of the force from gravity of the entire structure/wheel is located at the pivot.
2. On the right, as the movable bar flips out/falls peripherally from gravity, there is then more torque produced compared to the left side whereby the bar is located inwards and more towards the pivot.
3. The asymmetrical torques generated then induces the wheel to rotate clockwise to the right.
4. In turn, this causes the next upper adjacent movable bar to come into position, so it too can flip out/fall peripherally from gravity/inflow of space. This ongoing function again effects a net asymmetric torque producing rotation to the right.
5. In succession, the same process repeats itself, again and again, and so on and so forth infinitum.
6. The explanation given above is fairly straightforward, but in fact, the true functionality of this machine is much more multifaceted as now conveyed.
7. This is because during the "fall" (time of flight) of the bar on the right, the overall mass on the left side of the wheel is then greater compared to the right side. So during this "time of flight frame," the wheel rotational rate slows, assuming it already is rotating clockwise to begin with.
8. Additionally, as noted in the video, as the bar on the right ends its fall when it interacts with the wheel, this development adds angular momentum/velocity/rotation to the wheel rotating to the right (clockwise).
9. However, when the wheel's rotational velocity to the right increases, the "time interval of flight" of the "falling" bar also increases. So, for that added interim (time), the mass on the left remains greater relative to the right side, thus slowing rotation.

10. Furthermore, as the wheel's rotation rate increases to the right (clockwise), there is less momentum added to the wheel whenever the falling bar interacts/stops relative to the wheel.

11. Discern that the above functions (7, 9, and 10) counteract the asymmetrical torques which produce the primary initial rotation to the right as illustrated in figures M.1, M.2, and M.3.

12. As a result, there is an equilibrium involving all the above functions/forces, which maintains a constant rate of rotation clockwise as depicted in the video.

13. Fundamentally, the primary driving force for rotation to the right (clockwise) is a function of the asymmetrical torques being greater on the right than the left. But as the rotation velocity increases, functions 7, 9, and 10, as described above, come into play until there is an equilibrium.

14. Again, the primary driving force for continuous rotation without apparent energy input is a function of the asymmetrical torques as depicted/theorized/posited vis-à-vis figures M.1, M.2, and M.3.

15. To all intents and purposes, this is a perpetual motion machine exhibiting over-unity.

16. The **overall mass** on each side of the fulcrum is the same and the force from gravity (inflow of space) is also identical on each side.

17. Essentially $F = ma$ on one side of the fulcrum is equal to $F = ma$ on the other side. In other words, there is no imbalance of linear Newtonian $F = ma$ because it is equal on both sides.

18. Therefore, given the assumptions of only linear Newtonian physics ($F = ma$), there is no underlying reason for it to rotate; nevertheless, it does.

19. Alternately, regarding rotational physics, the torque is greater on the right vs. the left, so in fact as shown, it rotates.

20. What all this indicates, as already stated above, is that Newtonian linear physics ($F = ma$) is distinct from rotational physics (torque).

21. For that reason, one cannot explain/understand this device by utilizing Newtonian physics but rather only with rotational physics.

22. So where does the over-unity force/energy originate from? It cannot be from gravitational potential energy, because after 360 degrees of rotation, the wheel is back to its starting point. This is the law of conservation of energy.

23. Once again, energy is drawn from the continuous accelerating factor of inflow of space/ether (gravitational field), to some extent, analogous to the production of energy as a function of water falling from a dam. **See Chapter 2**

The author has one more reflection. Numerous other experimenters have proclaimed over-unity inventions. Even so, given that they all contradict the law of conservation of energy, they are ridiculed, ignored, and perhaps, even suppressed. However, if the device described above eventually proves valid (Big Perpetuum Mobile), which the author believes is true, then the classic law of conservation of energy is in erratum. Presuming this is so, this opens a pathway for acceptance by the scientific community, moreover, even perhaps, for all of mankind of the potential for other over-unity inventions. Hopefully then, closed minds will then be open to new concepts, ideas, and developments, including other over-unity devices.

M.3 The Suppression of Paradigm Shift Scientific Theories and Breakthrough Inventions

The following topic is highly controversial. As such, the author hesitates to even write about it.

The subject matter is this:

Why are new scientific discoveries/inventions/ theories habitually suppressed and ridiculed, furthermore, their originators punished such as Copernicus (death) and Galileo (imprisonment)? In addition, Newton was reluctant to publish his paper titled *Philosophic Naturalis Principia Mathematica* but eventually did so, however, only with help/protection from some of the English nobility. By the same token, regarding present-day inventors/engineers (like Eric Laithwaite), they are time and again ignored, ridiculed, and even ostracized.

To understand why, one must recognize what is, in fact, true human nature. Accordingly, by necessity, this section involves politics and religion, very delicate subjects to deliberate, moreover, not the usual subject matter appropriate for scientific papers.

→However, before proceeding, the author acknowledges that human behavior/motivation is highly complex and multifactorial. Therefore, the following premise is just one aspect among many←.

Generally, regarding all human societies, there are the rulers and the others, the oligarchy and the general population. The real battle/conflict is always between central government control (oligarchy) versus individual liberty of the general population.

For instance, here is a list.

- | | |
|---------------|----------------------|
| 1. Communism | 11. Czars |
| 2. Capitalism | 12. Mercantilism |
| 3. Socialism | 13. Religious rulers |
| 4. Nazism | 14. Mullahs |
| 5. Caliphate | 15. Chiefs |
| 6. Kings | 16. Autocracy |
| 7. Emperors | 17. Totalitarianism |
| 8. Pharaohs | 18. Despotism |
| 9. Dictators | 19. Fascism |
| 10. Theocracy | 20. Nobility |

It is the author's opinion that all these terms have one thing in common: There is the ruler (oligarch) and those who support him/her.

And then, there is the general population, basically, the serfs/cattle/sheep whom they control in order to serve them.

The conflict then is always between the oligarchy and the general population. In the United States, our founding fathers knew this. This is why we have a constitution, including the separation of powers, as well as The Bill of Rights. In addition, without the implementation/enforcement of those documents, there would be no middle class; what is more, almost all power and wealth would be concentrated in the hands of the oligarchy.

Although not outwardly apparent, we in the U.S. still have a hidden oligarchy; this is called the deep state or shadow government.

Below is a definition of the deep state.

The deep state is an alleged secret network of especially nonelected government officials and sometimes private entities (as in the financial services and defense industries) operating extralegally to influence and enact government policy. The power of the deep state comes from experience, knowledge, relationships, insight, craft, special skills, traditions, and shared values. [www.merriam-webster.com]

Below is a definition of the shadow government.

The shadow government is a network that denotes "individuals and groups bound together by a common ideological worldview that takes precedence over norms of democratic governance." According to this ideology, the shadow government is the true executive power, subservient to the official elected government. [www.aclj.org]

Our deep state/shadow government includes bankers, industrialists, old royalty of Europe, economically very powerful individuals, such as the Rothschilds, Soros, Soursuers, Rockefellers, Bezos, and the Saudi royal family.

In fact, most of the wealth of our nation is in the hands of a select few (oligarchy). Even so, the liberty we still possess, unlike some other societies, has allowed our population/middle class to accumulate and retain significant power and wealth.

So, regardless of whether there is communism, capitalism, socialism, Nazism, or theocracy, the oligarchy always possess/accumulate the vast majority of wealth and the general population maintains/produces that wealth for them. It does not matter what the system, the rulers are always wealthy and, with that wealth, comes control over their populations.

Basically, the oligarchy controls and manipulates the general population for their own benefit, power, and wealth by different means. These mechanisms include.

- | | |
|---|--|
| 1. Religion | 24. Food |
| 2. Propaganda (mainstream news) | 25. Water |
| 3. Shaping the narrative | 26. Language |
| 4. Economics | 27. Words |
| 5. Employment | 28. Environmental regulation |
| 6. Banking | 29. Health care |
| 7. Taxes | 30. Retirement |
| 8. Surveillance | 31. Control of travel |
| 9. Assassination | 32. Face recognition technology |
| 10. Social media | 33. Control of weapons |
| 11. Debt | 34. Screening for security |
| 12. Loans | 35. Military |
| 13. Credit | 36. Police |
| 14. Entertainment | 37. CIA, FBI, NSA |
| 15. Distraction | 38. IRS |
| 16. Laws | 39. Slavery |
| 17. Weather control | 40. The alpha male/female |
| 18. Chemtrails | 41. Psychologically divide and control the population (divide and conquer) |
| 19. Energy | 42. The keeper of politically correct knowledge (supposed correct knowledge) like scientific theories (alpha male/alpha female/professors) |
| 20. Peer pressure | |
| 21. Control of currency (e.g., Federal Reserve) | |
| 22. Psychology | |
| 23. Educational system | |

Now, sometimes the control is overt, such as with Hitler or Stalin. At other times, it is subtle/hidden as in the European Union. Pertaining to the European Union, the parliament is elected and can vote on new laws, but only the commissioners can propose that legislation. The commissioners are appointed—by whom?—the oligarchy. So, the population of the EU only thinks it is a democracy—not real.

So, in summary, whatever/whomever threatens the oligarchy's control mechanisms is then suppressed, ridiculed, ignored, imprisoned, and even at times, killed or assassinated.

"To find out who rules over you, simply determine who you are not allowed to criticize." (Voltaire)

Fundamentally, this is the main reason why new scientific discoveries and inventions are often suppressed and ridiculed, furthermore, their originators punished like Copernicus (death) and Galileo (imprisonment). **Principally, they threatened the oligarchy's power and control over their populations.**

What this all indicates is that if the concept/theories and potential inventions as hypothesized in this book are proven correct, this fact then endangers the oligarchy's control structures over their populations. As such, there would be extreme opposition to their acceptance, especially regarding their economic implementation. This is assuming they could not control them for their own advantage and profit.

So, at least for now, this author wishes to remain anonymous. There are minor reasons, such as resistance from mainstream physicists to new ideas from a novice who is not part of their hierarchy, resistance from industry related to new inventions that destroy profits, resistance from the military in order to sequester for advantage, and finally, and most importantly, resistance from the true hidden deep state governments in order to maintain the central control mechanisms over their populations.

But the major reason for remaining anonymous is encoded in the letters as follows (A. g. f. t. L. U. i. i. p. f. m., a. o. m.). As for now, this encrypted message will remain concealed, until, moreover, if this book's theories ever come to light. If so, compared to what these initials represent, then all that lies within this article then shrinks to insignificance.

Presuming the theories presented in this article are valid, furthermore, derived inventions come to fruition, then in the author's opinion, this will result in a paradigm shift relative to all of human history.

But as always with great change, there is enormous conflict as different factions vie to keep or newly obtain wealth, power, and control. And so, before the dawn of a new era, comes the night.

APPENDIX N

EQUIVALENCE PRINCIPLE, INERTIA, INERTIAL MASS, ETHER, ACCELERATION, AND RESISTANCE TO ETHER

Abstract

This appendix gives further explanation to the weak equivalence principle, inertia, inertial mass, ether, acceleration, and resistance from the ether.

In addition, this sequel is an adjunct to the postulates purposed in chapters 2 and 5 regarding the concepts given above. Before continuing, the author presents five illustrations representing some of these basic ideas. Furthermore, these entities all interconnect with one another. Nevertheless, in order to simplify the concepts, the first group of figures demonstrates each function individually. The reasoning behind this is: if one can understand each distinct definition, then for the reader, it will be much easier for him/her to appreciate their complex interactions especially when evaluating the subsequent passages.

What is more, to help the reader understand this appendix, the author has simplified/changed/clarified some of the terminology when compared to Chapter 2 (pages 36 to 46) and Chapter 5 (pages 273 to 278). Even so, it still would be helpful to review those chapters before appraising this appendix.

The first set of illustrations is enumerated below.

1. Illustration of the ether at rest (frame) and its relationship to an object (matter).
2. Illustration of the velocity ether wind (frame) and its relationship to an object.
3. Illustration of the accelerating ether wind (frame) and its relationship to an object.

4. Illustration of force and acceleration exerted on an object by a rocket (outside the frame of the ether) = $F = ma$.
5. Illustration of the resistance produced by ether as a function of the acceleration of an object (matter) by force.

N.1 Illustration of the ether at rest (frame) and its relationship to an object.

See Figure N.1 below.

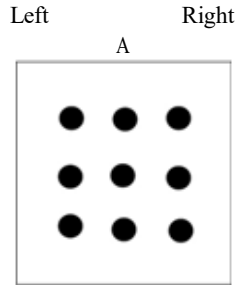


Figure N.1

- The square is the object = A .
- The black circles located within the square depict individual atoms making up the object.
- The white area in and around the square represents the ether at rest.
- The object is also at rest with the ether.
- There is no interaction between the ether at rest and the object (atoms).

N.2 Illustration of the velocity ether wind (frame) and its relationship to an object.

See Figure N.2 below.

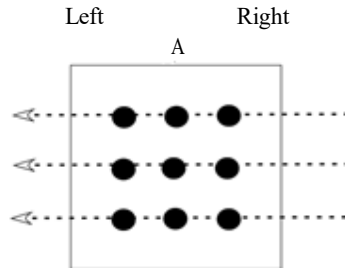


Figure N.2

- The square is the object = A .
- The black circles are individual atoms making up the object.
- The horizontal arrows with the dotted lines, right to left, represent the velocity ether wind frame.
- There is no interaction between the velocity ether wind frame and the object (atoms).

N.3 Illustration of the accelerating ether wind (frame) and its relationship to an object.

See Figure N.3 below.

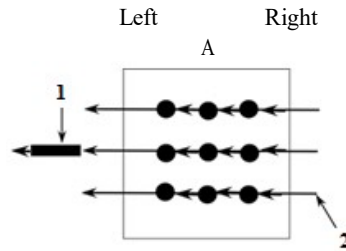


Figure N.3

- The square is the object = A .
- The black circles are individual atoms making up the object.
- The three long black solid horizontal arrows oriented right to left depict the accelerating ether wind frame.
- The solid black arrowheads, right to left, associated with each atom characterize acceleration directed at each individual atom separately within the object as a function of accelerating ether frame.
- 1 represents the overall accelerated object moving in synchrony along with the accelerating ether wind frame.

N.4 Illustration of force and acceleration exerted on an object by a rocket (outside the frame of the ether) = $F = ma$.

See Figure N.4 below.

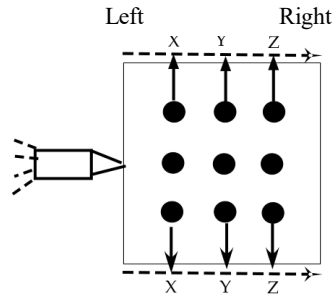
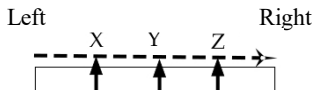


Figure N.4

- The square is the object.
- The black circles are individual atoms making up the object.
- Assume the ether, which is at rest, is the white area located in and around the object.
- The rocket accelerates the object by force ($F = ma$), depicted by the horizontal arrows with the dotted lines pointed to the right labeled X, Y, and Z. This form of acceleration is linear sequential acceleration (LSA).

• In other words, the force from the rocket ($F = ma$) causing acceleration is linear and sequential from X to Y to Z (atom-to-atom) from one side of the object to the other side; →left side to right side← (see below).



- The black circles are individual atoms making up the object.
- For purposes of this illustration, X, Y, and Z are inaccurately depicted outside the object, but in fact, all the atoms within the object are affected the same way, from atom-to-atom, left to right.
- Assuming the object is initially at rest with the ether, then as function of the rocket's $F = ma$, it is accelerated to the right.
- Alternatively, presuming the object initially possesses motion to the left, the rocket's $F = ma$ (LSA) will slow that motion, stop that motion, or reverse that motion, depending on the magnitude and duration of $F = ma$.

N.5 Illustration of resistance produced by the ether as a function of the acceleration of an object (matter) by force.

See Figure N.5 below.

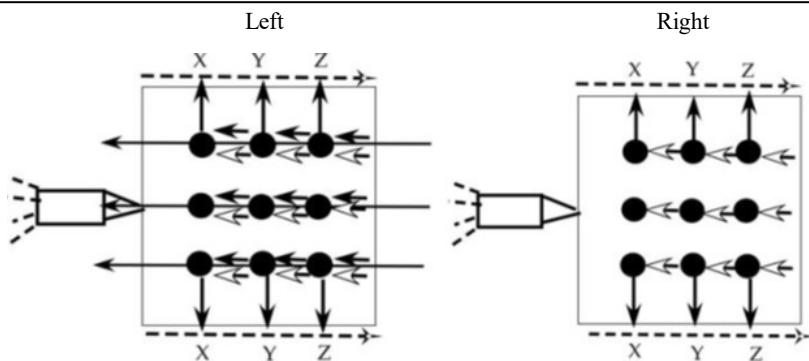
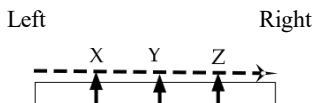


Figure N.5

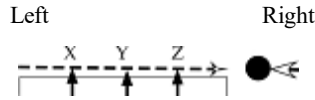
• **Right side:** The object is initially at rest with the ether, also at rest. Subsequently, the $F = ma$ of the rocket then accelerates the object by linear sequential acceleration from left to right (LSA) (see below).



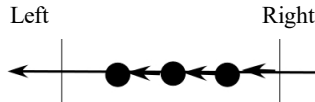
• As a result, there is then resistance to this form of acceleration (LSA), which is individual atom resistance (IAR) within the object from the ether. The individual atom resistance (IAR) produced by the ether is represented by the single hollow arrows located adjacent to each atom pointing to the left, moreover, in opposition to the $F = ma$ of the rocket (see below).



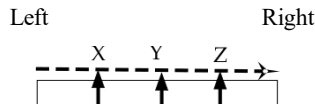
- As a result, the object is compacted from both the LSA of the rocket and the resistance from the ether (IAR) (see below).



- Left side: In contrast, the accelerating ether wind frame within the object accelerates each individual atom separately (IAA), from right to left (see below).



- The rockets $F = ma$ (LSA) is in the opposite direction, left to right (see below).



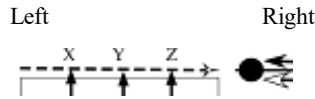
- As a response to the rockets $F = ma$, this function then induces individual atom resistance (IAR) within the object from the same ether frame, again right to left (see below).



- In this case, the ether is both the accelerator and resister. Because of this dual function, it is illustrated by the hollow arrow and the solid arrow located side by side, both pointing at each individual atom to the left (see below).



- Again, the object is compacted from both the LSA of the rocket and the resistance from the ether (IAR + IAA) in opposite directions (see below).



Now, after reviewing these five illustrations, it should be significantly easier for the reader to interpret, furthermore, understand the following complex figures and passages. Even so, it still will be necessary to integrate all the different concepts into one overall conceptual picture. The following figures and captions use the five basic definitions, as just presented, in conjunction with one another to give explanation to the weak equivalence principal, inertia, inertial mass, ether, acceleration, and resistance from the ether. They are labeled A thru E.

A. See Figure N.6 below.

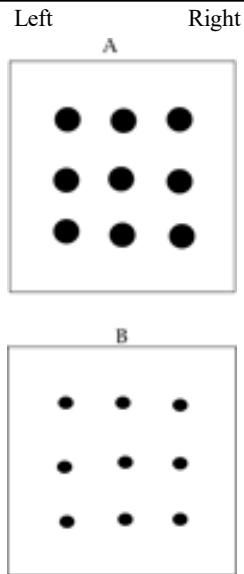


Figure N.6

- *The squares represent objects A (top) and B (bottom).*
- *The white area around and within the objects depicts the ether at rest.*
- *In addition, the objects are also at rest with the ether.*
- *The black circles located within the squares portray individual atoms that make up the objects.*
- *The larger black circles of A indicate that those atoms possess a greater atomic weight compared to the smaller circles of B.*
- *There is no interaction between the ether at rest with either object (atoms).*

Refer to Figure N.6 above. Picture in your mind an imaginary universe consisting of only the ether and two objects which differ from one another; they are of equal volume, but one has twice the atomic weight compared to the other. A = greater atomic weight, B = lesser atomic weight. Then, envision that A is positioned directly above B, both at rest within the ether of the universe also at rest. Now, pertaining to this specific setting, there is no interaction between the objects (atoms) with the ether.

A. See Figure N.7 below.

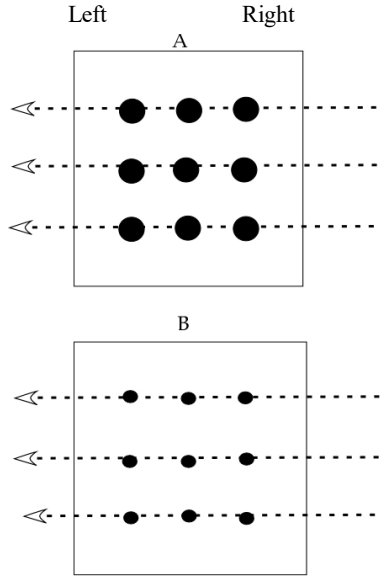
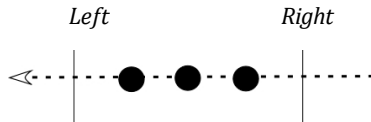


Figure N.7

- Assume the same scenario as Figure N.4, but now there is a velocity ether wind from right to left.
- The squares represent objects A (top) and B (bottom).
- The horizontal dotted lines depict the velocity ether wind frame from right to left (see below).



- The black circles located within the squares portray individual atoms that make up the objects.
- The larger black circles of A indicate that those atoms possess a greater atomic weight compared to the smaller circles of object B.
- Again, there is no interaction between the velocity ether wind and either object (atoms).

Refer to figure N.7 above. Next, assume there exists a velocity ether wind (frame) from right to the left. As a result, again there is no interaction between the objects (atoms) with the velocity ether frame.

C. See Figure N.8 below.

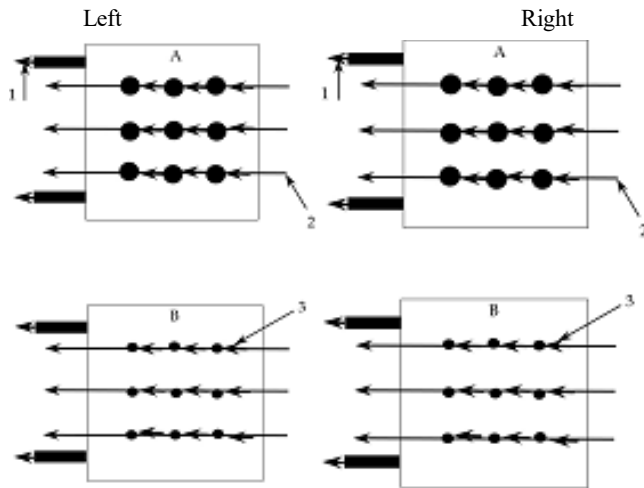
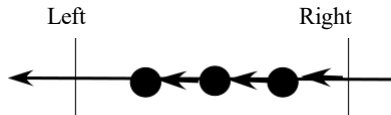


Figure N.8

- Assume the same scenario as Figure N.4, but now, there is an accelerating ether wind from right to left.
- The squares represent objects A (top) and B (bottom).
- The black circles located within the squares portray individual atoms that make up the objects.
- The larger black circles of A indicate that those atoms possess a greater atomic weight compared to the smaller circles of object B.
- The horizontal solid lines with the solid arrowheads (2) from right to left illustrate the accelerating ether wind (see below).



- The black arrowheads located adjacent to each atom from right to left (3) portray individual atom acceleration as a function of the accelerating ether frame (2) (see below).



- The overall acceleration of the objects (A and B) as a function of the accelerating ether frame (2) is depicted by the large black arrows located to the left of each object and pointing to the left (1) (see below).



- The images right to left represent the change in movement over time.
- In this case, the accelerating ether wind accelerates both objects equally and symmetrically, independent of their different atomic weights, as there is no resistance.

• →The acceleration of both objects is also in synchrony with the accelerating ether frame (same rate of change), moreover, unaltered from right to left (time)←.

Refer to Figure N.8 above. Now, presume instead of a velocity ether wind, there is an accelerating ether wind (accelerating frame), again from right to the left. In this second instance, there is now an interaction between the objects (atoms) as a function of the accelerated ether frame. For that reason, both objects, notwithstanding of their different atomic weights, symmetrically and equally accelerate synchronously along with ether wind's acceleration rate. This function is independent of atomic weight, →because there is no resistance (no inertial mass)←.

D. See Figure N.9 below.

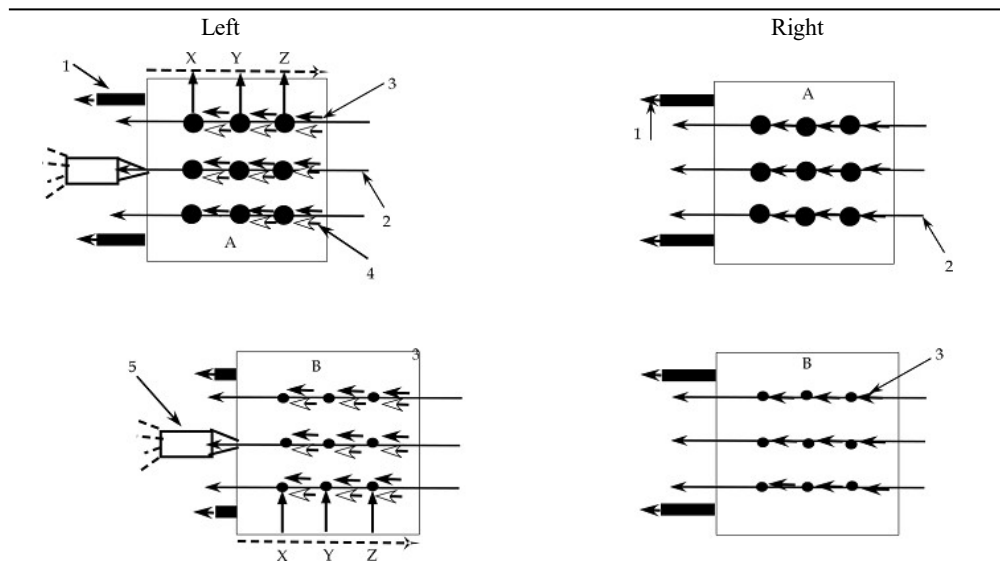
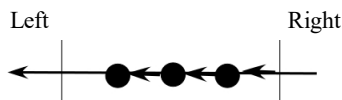


Figure N.9

- The squares represent objects A (top) and B (bottom).
- The black circles located within the squares portray individual atoms that make up the objects.
- The larger black circles of A indicate that those atoms possess a greater atomic weight compared to the smaller circles of object B.
- The horizontal solid lines with the solid arrowheads from right to left (2) depict the accelerating ether wind frame. (see below).



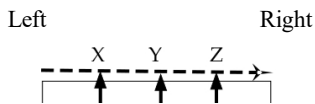
- The black arrowheads located adjacent to each individual circle from right to left (3) portray individual atom acceleration within the objects as a function of the accelerating ether frame (2) (see below).



- The overall acceleration of the objects (A and B), as a function of the accelerating ether wind (2), is illustrated by the large black arrows positioned to the left of each object pointing to the left (1) (see below).



- The images, from right to left, portray the change in movement over time. On the right side, the objects are affected by the accelerating ether wind frame, and that induced motion over time is countered by the rockets located on the left side.
- (5) represents the identical rockets exerting $F = ma$ (LSA) against the frame of the motion of the objects.
- X, Y, and Z depict linear sequential acceleration, produced by the rockets, from atom-to-atom from one side of the object to its other side, left to right (from X to Y to Z) (see below).



- The hollow arrowheads and solid arrowheads viewed together (3 and 4) located adjacent to each atom represent resistance from the ether to the acceleration of the objects produced by the rocket; this is individual atom resistance from right to left (see below).



- So the same accelerating ether frame that accelerates the objects (3) independent of atomic weight then switches functions and resists the motion, produced by the rockets (3 and 4) but now as a function of atomic weight. This is why there are two arrows pointed at each individual atom within the objects to the left (see below).



- Again, because the ether is both the accelerator (black arrow head) and the resister (white arrow head) then under the influence of the rockets $F = ma$ (LSA) both of the arrows point to each and every atom individually in conjunction with one another from right to left (see below).



Working together — not alone.

- (A) with the greater atomic weight de-accelerates (relative acceleration) less than the one with the lesser atomic weight (B) thus the change noted in their relative positions with respect to Figure N.9.

Refer to Figure N.9. After that, postulate that identical forces $F = ma$ (LSA) from the rockets are applied independently to each object, A and B, in the opposite direction of their accelerating frame motion. Consequently then, what happens? The one with the greater atomic weight (A) slows less than the one with the lesser atomic weight (B). This is because the same equally applied force from the rockets has less effect on A compared to B ($F = ma$). And this is because the inertial mass (atomic weight) of A is greater than B → as a function of the resistance from **only** the ether←. Note again that the forces from the rockets causing acceleration are sequential (atom-to-atom) from one side of the object to its other side, whereas the responding resistance from the ether is exerted on each atom separately within the objects.

E. See Figure N.10 below.

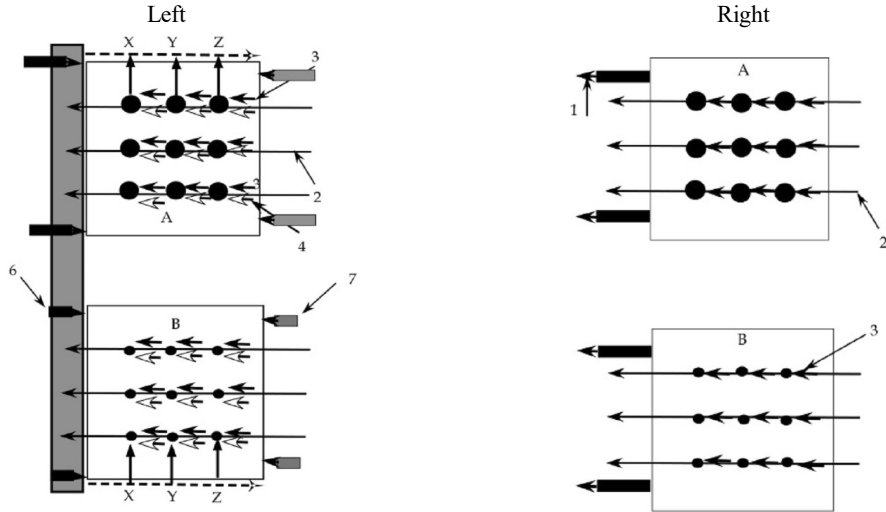
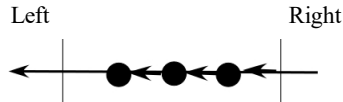


Figure N.10

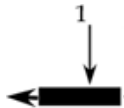
- The squares represent objects A (top) and B (bottom).
- The black circles located within the squares portray individual atoms that make up the objects.
- The larger black circles within A indicate that those atoms possess a greater atomic weight compared to the smaller circles within object B.
- The three horizontal solid black lines with their solid arrowheads (2) depict the accelerating ether wind, from right to left (see below).



- The black arrowheads located adjacent to each circle from right to left (3) portray individual atom acceleration as a function of the accelerating ether wind (2) (see below).

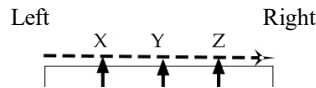


- The overall acceleration of the objects (A and B) produced by the accelerating frame (2) is illustrated by the large black arrows located to the left of each object and pointing to the left (1) (see below).



- The images from right to left show the change in movement over time. On the right side, both objects are affected by the accelerating ether wind frame and then that accelerated motion at a later time is countered/blocked by the wall (left side).

- The rectangular gray vertical structure on the extreme left symbolizes a wall, which blocks the ongoing acceleration of the objects.
- In other words, assume the wall is at rest/fixed (blocking action) relative to the accelerating frame/objects.
- Therefore, when the objects crash into the wall (de-acceleration), this, in effect, is equivalent to acceleration against the motion of the accelerating ether frame/objects. The wall's blocking force/acceleration exerted on an object is sequential from atom-to-atom-to-atom = X to Y to Z (see below).



- However, the responding resistance to this acceleration originating from the ether then acts on each atom within the object separately (3 and 4 together) (see below).



- Therefore, the same frame that accelerates an object (3) which is independent of atomic weight then switches functions and resists the change in the object's motion (3 and 4 together), moreover, now as a function of atomic weight. The dual function is the reason why there are two arrows pointed at each atom from right to left (see below).

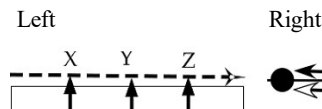


- Again, because the ether is both the accelerator (black arrowhead) and the resister (white arrowhead), then under the influence of the blocking wall $F = ma$ (LSA), both arrows' resistance derived from the ether point to each and every atom separately and in conjunction with one another from right to left (see below).



Working together — not alone.

- Therefore, both objects are compacted (6 and 7). (See below)



- Since A has a greater atomic weight, it is compacted more than B, and the force exerted on the wall is also greater for A than B (momentum).

Refer to Figure N.10 above. Alternatively, given the same condition, hypothesize that both objects under the influence of the accelerating ether wind simultaneously crash into a wall, which itself is un-accelerated and fixed with respect to this frame (fixed blocking effect). As a result, both objects de-accelerate (relative acceleration = LSA) equally; notice, the force (momentum) exerted on the wall is greater for A relative to B, and the compaction of A is greater than B. This is because the inertial mass/momentum/atomic weight of A is again greater than B, →as a function of the resistance from **only** the ether←.

Before continuing, as revealed below, please review the hypotheses as portrayed in chapters 2 and 5 regarding inertial mass/inertia with its associated definitions/lexicology/symbolism, moreover, as to how

they relate to the inflow of the ether/space (PFGRT). In addition, after reviewing the following segment, please apply those concepts to the ideas just presented, then clarified in the ensuing section (Page 416 and continuing).

In the author's opinion, the following subject matter is extremely difficult to describe, so one needs to really reflect in order to appreciate it. Given the fact that it is so complex, with reference to the following discussion, there is considerable redundancy. Hopefully, the many viewpoints presented will help the reader eventually appreciate this highly abstract topic.

- Recollect, as already articulated in Chapter 2 (pages 36 through 46), the inflowing ether frame has a \rightarrow velocity factor \leftarrow as well as an \rightarrow acceleration factor \leftarrow . The following explanation refers to only the acceleration factor, which has two basic aspects as defined below.

- The accelerating factor of the inflowing ether frame (IAA, aka free-fall ether frame) acting alone, thereby producing a free-falling object, possesses two separate functions/aspects that are distinct but still interconnect with one another, the "**falling force aspect**" (IAA*) (dependent on atomic weight) and the "**acceleration aspect**" (independent of atomic weight) (IAA**).

- For further clarity, regarding a free-falling object, since the acceleration aspect of inflowing ether (space) (IAA**) acts equally and separately on all of the individual atoms, including atoms of different atomic weights, within the object, moreover, without a counteracting opposing force/resistance, then objects of different atomic weights "free fall" at the same rate—the weak equivalence principle. So, for that object, no compaction transpires (no inertial mass); the object is in geodesic/weightless/free-falling motion. Observe, vis-à-vis this scenario, atomic weight has no effect on the rate of fall. See site: <http://aether.lbl.gov/www/science/equiv.html>.

- In contrast, the falling-force aspect (IAA*) exerted on those same atoms (falling objects) is a function of their atomic weights. Consequently, this force will vary, even though the accelerations are all the same.

- Assume the resistance from the ether, which is a function of the acceleration of objects, relative to itself (ether) by an outside force (e.g., rocket, blocking Earth, LSA) is what produces inertial mass. So, if there is no relative acceleration, there is no resistance = no compaction/inertial mass. And if there is no inertial mass, then the falling force aspect (IAA*) will accelerate all objects (atoms) equally (\rightarrow **because there is no resistance** \leftarrow) independent of their different atomic weights; essentially, it transforms into the acceleration aspect (IAA**). This is how the falling-force aspect (IAA*) and the acceleration aspect (IAA**) interconnect (IAA = IAA* + IAA**). \rightarrow They are actually two aspects of the same thing \leftarrow . For this reason, atoms of different atomic weights free fall at the same rate, but their falling forces will differ.

- In summary, the falling force aspect (IAA*) vis-à-vis free-falling objects (geodesic motion) is dependent upon atomic weight, thus diverse. Alternatively, the acceleration aspect (IAA**) exerted on the same objects is independent of atomic weight, so equal. For the latter reason, objects of different atomic weights, then free fall/accelerate at the same rate. This is because these objects manifest no inertial mass, and if there is no inertial mass (resistance) then the falling force aspect (IAA*) accelerates objects of different atomic weights equally, just like the acceleration aspect (IAA**) (actually, they are one and the same; IAA = IAA* + IAA**) = weak equivalence principle. Even so, again the force of falling, on the other hand, regarding those objects, varies as a function of atomic weight (IAA*).

The concepts, as just defined, refer to only the acceleration factor (IAA) and its two basic functions, the falling force aspect (IAA*) and the acceleration aspect (IAA**). The following definitions explain how the resistance from the ether interrelates with the attributes as just presented.

1. The inertial mass of an object is not the intrinsic property of the object as classically assumed. Rather, it is the object's interaction with the ether which produces that inertial mass. In essence, both entities are required, the accelerating object (LSA = linear sequential acceleration, $F = ma$) and the responding resisting ether (IAR = individual atom resistance), in opposite directions, resulting in compaction. \rightarrow And so, if there is no accelerated interaction with compaction, then there is no inertial mass \leftarrow .

2. The inertial mass of an object is a function of its acceleration relative to its own associated adjacent/internal ether, therefore inducing resistance from that frame (IAR) = compaction. Recall, the ether exists within the object as well as surrounding it, thus the term adjacent/internal.

3. If an object is at rest with the ether, or at a velocity relative to the ether, then there is no accelerated interaction (compaction). As such, the object is weightless in geodesic motion. Now, in that setting, we assume the object possesses inertial mass. However, the only way to demonstrate/prove inertial mass is to accelerate it with respect to its own accompanying adjacent/internal ether.

4. In other words, if the object is in geodesic motion, there is no way to prove that it possesses inertial mass. So the author posits this basic assumption: →An object in geodesic motion does not possess inertial mass, for in that setting, there is no accelerated interaction with its own adjacent/internal ether. Again, for that object, if there is no compaction/resistance, there is no inertial mass←.

5. As a corollary, when an object free falls to Earth, from the acceleration aspect of inflowing space (ether) (IAA**) without opposing resistance, it is weightless in geodesic motion. But most importantly, it is at rest with its own adjacent/internal-synchronized acceleration of the inflowing ether (free-fall ether frame). This last concept is very abstract—because the free-falling object is a product of the acceleration aspect absent resistance (IAA**). However, unless it is further accelerated (LSA) with respect to its own free-fall ether frame with responding resistance from that frame, inertial mass cannot be proved or demonstrated.

6. This theory posits that when an object is at rest with the ether, at a velocity relative to the ether, or else at rest with its own adjacent/internal-synchronized, accelerating, inflowing ether (IAA = IAA* + IAA**), it then possesses no inertial mass (no compaction/no resistance).

7. Only when an outside force (LSA, $F = ma$, rocket), accelerates an object, relative to stationary ether, velocity of ether, or again relative to its own adjacent/internal-synchronized accelerating inflowing ether (IAA), all with compaction/resistance, does it then exhibit inertial mass. In all other settings, it manifests no inertial mass.

8. →In the simplest terms, the concept is this: Whenever an object is in geodesic motion (weightless), then at that time, in and of itself, it possesses no inertial mass←.

9. The inertial mass of an object is a function of its acceleration (or relative acceleration) applicable to its own adjacent/internal ether by an outside force ($F = ma$, LSA), furthermore, with an opposing resistance generated from that ether frame (IAR) = compaction. Only as a product of compaction is then inertia present. However, in contrast, it is not inversely related to the inflowing ether's individual atom acceleration (IAA) exerted upon the object without resistance, whereby there is no compaction. So, without the object's compaction, one cannot prove or demonstrate inertia or inertial mass.

10. To recap, imagine a free-falling object in geodesic motion. The object's motion is a product of both the acceleration aspect (IAA**) and the falling force aspect (IAA*), which are separate functions; nevertheless, they still interconnect (IAA = IAA* + IAA**). Accordingly, objects of dissimilar atomic weights free fall equally notwithstanding that their falling forces differ dependent upon atomic weight. If there is no resistance/inertia, then the falling force aspect (IAA*) accelerates all objects equally; it transforms into the acceleration aspect (IAA**). Again, this is how the falling force aspect (IAA*) and the acceleration aspect (IAA**) interrelate. It is only when the free-falling object is further accelerated (LSA) relative to its own already-accelerated frame, free-falling ether frame (IAA), such as from rocket—LSA, that the resistance from the ether then emerges. So at that time, the object becomes compacted = inertial mass.

Now, employing the symbolism/vocabulary of chapters 2 and 5 as imparted above, furthermore, correlating/intertwining them with the concepts defined at the onset of Appendix N, then from the reference frame of the two objects (A and B in Appendix N), the accelerating ether wind frame is equivalent to the acceleration factor—IAA = falling force aspect (IAA*) + acceleration aspect (IAA**). And the wall is representative of force, $F = ma$ (blocking LSA) exerted on the objects in opposition to that accelerated ether frame. Consequently, there exists a responding resistance from that frame (IAR + IAA). Again, recall the force/acceleration on objects from the wall is linear sequential atom-to-atom (LSA) while the effect from the ether is related to individual atom resistance located within the object (IAR + IAA). So there is then compaction/inertia/inertial mass.

These descriptions are very complex; therefore, see important concepts below. Please interrelate the conceptions presented in chapters 2 and 5 as reviewed above (inertia /inertial mass/PFGRT) with that now presented below (objects A and B, Appendix N).

Here are the important elements, complex yes, nevertheless still necessary for understanding and evaluating this hypothesis.

- The accelerating ether wind frame accelerates all objects (atoms) equally, independent of atomic weight, because this frame affects each and every atom individually within the object →without resistance← (the latter of which produces inertia/inertial mass). →For this reason, objects then accelerate in synchrony along with the accelerating ether frame (IAA**)←. Again, this is because if there is no resistance, there is no compaction or inertia/inertial mass. This is the reason why objects of different atomic weights free fall to Earth at the same rate—no resistance, therefore, no compaction/no inertia/no inertial mass; the weak equivalence principle. Even so the force of falling (object/atoms) is still dependent on atomic weight (IAA*).

- However, whenever an outside force ($F = ma$, rocket or wall) de-accelerates the object (actually relative acceleration = LSA), against the motion of the accelerating frame/object, then as a function of this same frame (accelerating ether wind frame), there is then a responding resistance within the object (IAA + IAR), resulting in its compaction (inertial mass), moreover, now dependent on atomic weight.

- Discern, regarding these examples, the same ether is both the accelerator, independent of atomic weight and the resister, dependent on atomic weight. In addition, the de-acceleration (actually relative acceleration) of the objects produce by the rockets/wall (blocking effect = $F = ma$,) against the accelerating wind frame/object is sequentially from atom-to-atom originating from one side of the object to the other side and is dependent on atomic weight (LSA).

- This type of acceleration (LSA) contrasts with that other form of the acceleration produced by the ether, which is not a function of atomic weight, moreover, is exerted on individual atoms separately within the object (IAA**).

- Another way of perceiving all of this is: The accelerating ether wind acts upon each separate atom within the objects (objects A and B) without compaction (no resistance, therefore, no inertial mass). →Consequently, there is symmetry between the motion of the accelerating ether frame and the resultant accelerated motion of the objects← (A and B). See Page 410 (C, Figure N.8) for further explanation and labeling. Also refer to images below.

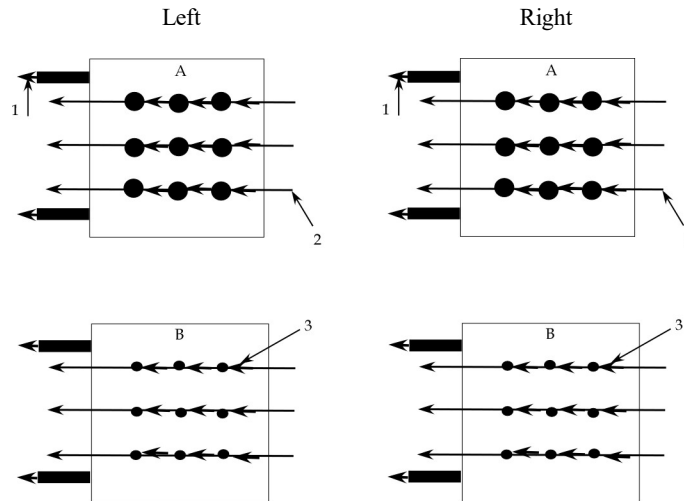


Figure N.11

C, Figure N.8, Page 410, Right to left = symmetrical movement of A and B over time

Repeat of Figure N.8, right to left = symmetrical movement of A and B over time. →This is only somewhat analogous to a row boat and an equivalent volume of Styrofoam transported equally by the flow of a river. They have different masses, but their rate of flow is identical. However, when those free-floating

objects strike a fixed object located within the river their differing inertia masses then becomes apparent (*momentum of boat > Styrofoam*)←. This later scenario blocking effect is not shown in Figure N.11.

• On the other hand, whenever this →combined synchronized motion← is disturbed/changed ($F = ma$, LSA, outside force = rocket and wall), this very same ether then resists that change, resulting in compaction (There is now inertia/inertial mass from only the ether.). See D, Figure N.9, (rocket) Page 411 and E, Figure N.10, (wall) Page 413 for further clarification and labeling. Also note the explanations below.

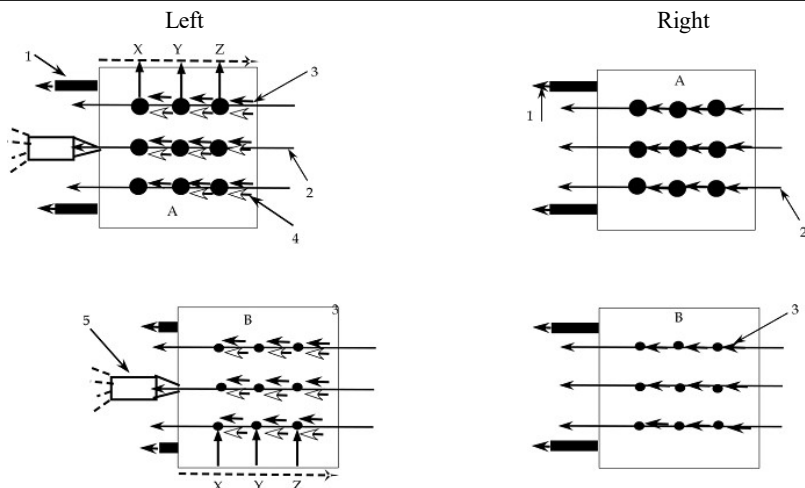


Figure N.12
 Repeat of D, Figure N.9, Page 411

Relevant to Figure N.12 left above, since A and B now possess inertial mass, then the equal rockets ($F = ma$, LSA) decelerate ($A < B$). And vis-à-vis Figure N.13 left below, object A possesses more momentum compared to object B, as they both simultaneously crash into the blocking wall. This is because, with respect to both scenarios, A and B now possess inertial mass ($A > B$). This is a function of the different amounts of resistance derived from **only** the ether to the objects differing atomic weights (while undergoing deceleration (LSA)).

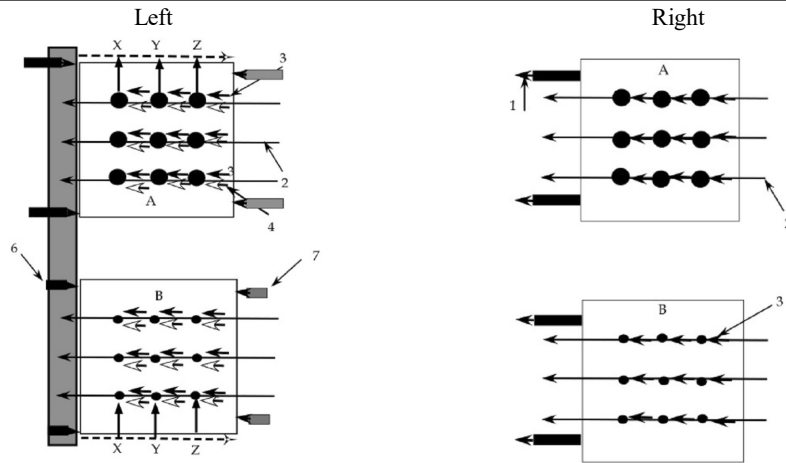


Figure N.13

Repeat of D, Figure N.10, Page 413

• In effect, the rockets and the wall disturb this →combined synchronized motion← by means of an outside force (outside the frame of the ether), $F = ma$, LSA. This outside form of force exerted on the object is sequential from atom-to-atom from one side of the object to the other (LSA), consequently inducing individual atom resistance within the object from the accelerating ether wind fame (IAR +IAA) = compaction of the object = inertia/inertial mass.

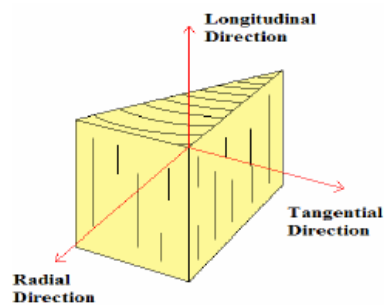
• →Therefore, the ether's resistance to acceleration of an object by an outside force (e.g., rocket, wall = LSA) relative to only itself (ether) is what actually produces inertia/inertial mass←.

• The function of the ether, whether acceleration or resistance, is always exerted on the individual atoms separately within the object. In contrast, the outside force (e.g., rocket) is sequential atom-to-atom from one side of the object to its other side. Fundamentally, →there are two different types of accelerations← which then interact with one another, vis-à-vis objects (matter), in a very complex manner = inertia, inertial mass, ether, acceleration, and resistance from the ether.

GLOSSARY

- **Anisotropy**

Anisotropy, in physics, is the quality of exhibiting properties with different values when measured along axes in different directions. *Encyclopedia Britannica*, <https://www.britannica.com/science/anisotropy>



https://www.researchgate.net/figure/Anisotropy-in-wood_fig5_251494186

Figure GL.1 Anisotropy [Fair Use]
Anisotropy—at least one of the directions is different.

- **Biot-Savart Law (equation)**

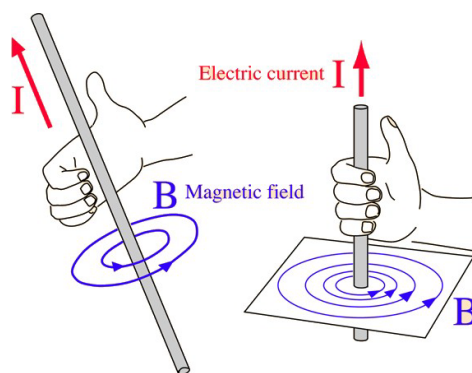
1. The **Biot-Savart Law** was named after Jean-Baptiste Biot and Felix Savart in 1820. They derived the mathematical expression for the magnetic flux density. The Biot-Savart Law is an equation that **explains the magnetic field created by a current-carrying wire**, allowing the calculation of its strength at various points.

Just Science at <http://bit.ly/2FtM3WN>

2. A statement in electromagnetism: the magnetic intensity at any point due to a steady current in an infinitely long straight wire is directly proportional to the current and inversely proportional to the distance from point to wire.

<https://www.merriam-webster.com/dictionary/Biot-Savart%20law>

3. The magnetic field lines around a long wire which carries an electric current form concentric circles around the wire. The direction of the magnetic field is perpendicular to the wire and is in the direction the fingers of your right hand would curl if you wrapped them around the wire with your thumb in the direction of the current.



<http://hyperphysics.phy-astr.gsu.edu/hbase/magnetic/magcur.html#e1>

Figure GL.2 Biot-Savart Law [Fair Use]
Figure represents a positive charge.

- **Bohr Model**

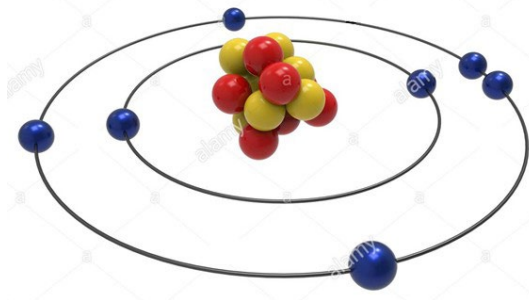
The **Bohr** model has an atom consisting of a small, positively charged nucleus orbited by negatively charged electrons. Below is a closer look at the Bohr model, which is sometimes called the Rutherford-Bohr model.

Niels Bohr proposed the Bohr model of the atom in 1915. Because the Bohr model is a modification of the earlier Rutherford model, some people call Bohr's model the Rutherford-Bohr model. The modern model of the atom is based on quantum mechanics. The Bohr model contains some errors, but it is important because it describes most of the accepted features of atomic theory without all of the high-level math of the modern version. Unlike earlier models, the Bohr model explains the Rydberg formula for the spectral emission lines of atomic hydrogen.

The Bohr model is a **planetary** in which the negatively charged electrons orbit a small, positively charged nucleus **similar to the planets orbiting the Sun** (except that the orbits are not planar). The gravitational force of the solar system is mathematically akin to the coulomb (electrical) force between the positively charged nucleus and the negatively charged electrons.

by Anne Marie Helmenstine, Ph.D., [ThoughtCo.]

<https://www.thoughtco.com/bohr-model-of-the-atom-603815>



<http://bit.ly/2xvUFYv>

Figure GL.3 Bohr Model [Fair Use]

• Bremsstrahlung Radiation

1. As in "braking radiation" or "deceleration radiation," bremsstrahlung radiation is produced by the deceleration of a charged particle when deflected by another charged particle, typically an electron by an atomic nucleus. The moving particle loses kinetic energy, which is converted into radiation (i.e., a photon), thus satisfying the law of conservation of energy. The term is also used to refer to the process of producing the radiation. Bremsstrahlung has a continuous spectrum, which becomes more intense and whose peak intensity shifts toward higher frequencies as the change of the energy of the decelerated particles increases.
2. Broadly speaking, bremsstrahlung or **braking radiation** is any radiation produced due to the deceleration (negative acceleration) of a charged particle, which includes synchrotron radiation (i.e., photon emission by a relativistic particle), cyclotron radiation (i.e., photon emission by a non-relativistic particle), and the emission of electrons and positrons during beta decay. However, the term is frequently used in the more narrow sense of radiation from electrons (from whatever source) slowing in matter.

<https://en.wikipedia.org/wiki/Bremsstrahlung>

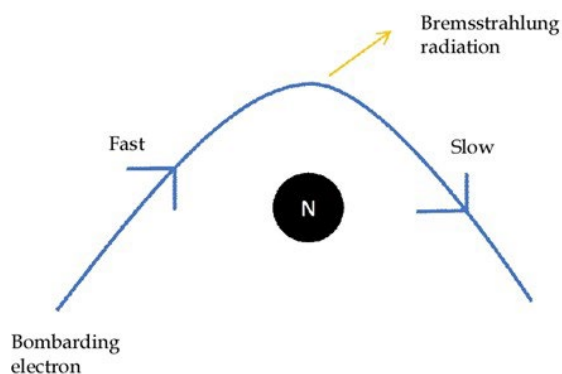
3. Bremsstrahlung, (German: "braking radiation"), electromagnetic radiation produced **by a sudden slowing down or deflection of charged particles (especially electrons) passing through matter in the vicinity of the strong electric fields of atomic nuclei**. Bremsstrahlung, for example, accounts for continuous X-ray spectra, i.e., that component of X-rays the energy of which covers a whole range from a maximum value downward through lower values. In generating Bremsstrahlung, some electrons beamed at a metal target in an X-ray tube are brought to rest by one head-on collision with a nucleus and thereby have all their energy of motion converted at once into radiation of maximum energy. Other electrons from the same incident beam come to rest after being deflected many times by the

positively charged nuclei. Each deflection gives rise to a pulse of electromagnetic energy, or photon, of less than maximum energy.

Bremsstrahlung is one of the processes by which cosmic rays dissipate some of their energy in the Earth's atmosphere. Solar X-rays have been attributed to bremsstrahlung generated by fast electrons passing through the matter in the part of the Sun's atmosphere called the chromosphere.

Internal bremsstrahlung arises in the radioactive disintegration process of beta decay, which consists of the production and emission of electrons (or positrons, positive electrons) by unstable atomic nuclei or the capture by nuclei of one of their own orbiting electrons. These electrons, deflected in the vicinity of their own associated nuclei, emit internal bremsstrahlung.

Encyclopedia Britannica <https://www.britannica.com/science/bremsstrahlung>



<https://www.radiologycafe.com/radiology-articles/frcr-physics-notes/production-of-x-rays>

Figure GL.4 Bremsstrahlung Radiation [Fair Use]

- *Bombarding electron approaches the nucleus.*
- *Electron is diverted by the electric field of the nucleus.*
- *The energy loss from this diversion is released as a photon (bremsstrahlung radiation).*

• De Broglie Wave Equation

1. An equation in physics: the de Broglie wavelength of a moving particle is equal to the Planck constant divided by the momentum of the particle.

Merriam Webster Dictionary <http://bit.ly/2ZEe6dA>

2. In layman's terms, the de Broglie equation says that every moving particle—microscopic or macroscopic—is associated with a wavelength. For microscopic objects, wave nature is observable. For larger objects, the wavelength is even smaller still, quickly becoming so small as to become unnoticeable.

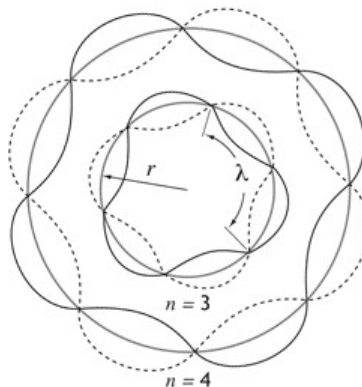
Quora.com <http://bit.ly/2J2QmJp>

De Broglie wavelength is a wavelength, which is manifested in all the particles in quantum mechanics, according to wave-particle duality, and it determines the probability density of finding the object at a given point of the configuration space.

The De Broglie Wavelength

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

λ = wavelength
 h = Planck's constant ($6.63 \times 10^{-34} \text{ J} \cdot \text{s}$)
 p = momentum
 m = mass
 v = speed



<https://www.quora.com/What-is-de-Broglie-wavelength>

Figure GL.5 De Broglie Wave [Fair Use]

De Broglie's extension of the concept of particle-wave duality from photons, to include all forms of matter, allowed the interpretation of electrons in the Bohr model as standing electron waves. De Broglie's work marked the start of the development of wave mechanics.

• Dipole

1. A **dipole** is a pair of equal and opposite electric charges or magnetic poles of opposite sign separated especially by a small distance.

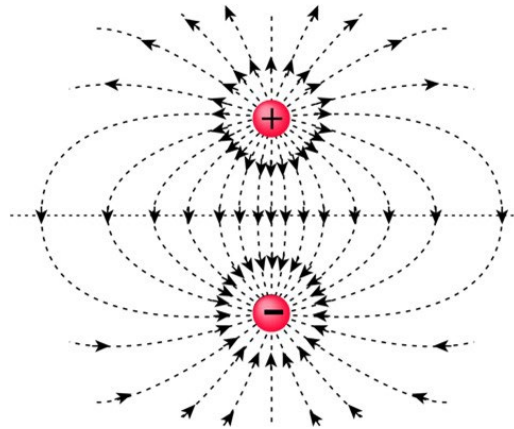
Merriam-Webster Dictionary <https://www.merriam-webster.com/dictionary/dipole>

2. In electromagnetism, there are two kinds of **dipoles**:

An electric dipole deals with the separation of the positive and negative charges found in any electromagnetic system. A simple example of this system is a pair of electric charges of equal magnitude but opposite sign separated by some typically small distance. (A permanent electric dipole is called an electret.)

<https://en.wikipedia.org/wiki/Dipole>

Electric Dipole

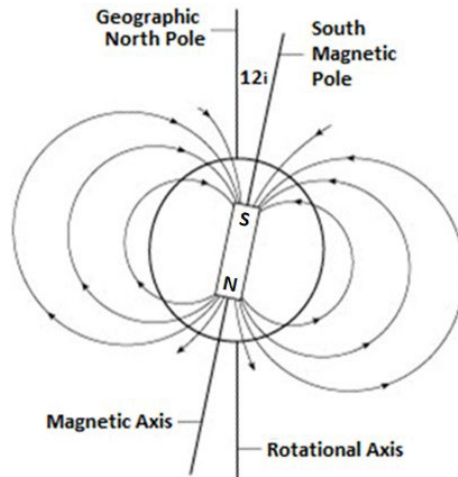


<http://bit.ly/2JrBPr6>

Figure GL.6 Dipole [Fair Use]

Magnetic Dipole

A magnetic dipole is the closed circulation of an electric current system. A simple example is a single loop of wire with constant current through it. A bar magnet is an example of a magnet with a permanent magnetic dipole moment.



https://ase.tufts.edu/cosmos/view_picture.asp?id=326 Wikipedia

Figure GL.7 Earth's Magnetic Dipole [Fair Use]

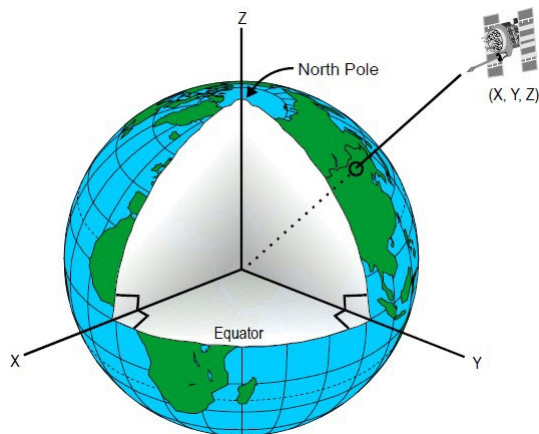
- **$E = mc^2$**

$E = mc^2$ is defined as a scientific equation that shows that energy equals mass times the speed of light squared, which shows the relationship between mass and energy. [Dictionary.com]

- **Earth-Centered Frame**

The Geocentric-Equatorial Coordinate System, a.k.a. the Earth-Centered Inertial frame, has its origin right at the center of the earth; however, it is not fixed to the earth. Although this frame has its origin at the center of the earth, it does not rotate with the earth.

<https://adcsforbeginners.wordpress.com/tag/earth-centred-inertial-frame/>



Wikipedia

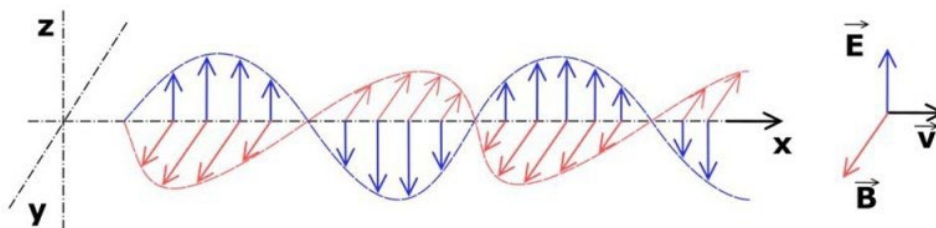
Figure GL.8 Earth-Centered Frame [Fair Use]

Earth-centered inertial (ECI) coordinate frames have their origins at the center of mass of the Earth. ECF frames are called inertial in contrast to the Earth-centered, Earth-fixed (ECEF) frames, which rotate in inertial space in order to remain fixed with respect to the surface of the Earth.

- **Electromagnetic radiation (EMR)**

Electromagnetic radiation (EM radiation or EMR), in physics, indicates waves (or their quanta, photons) of the electromagnetic field, traveling through space carrying electromagnetic radiant energy. It includes radio waves, microwaves, infrared, light, ultraviolet, X-ray, and gamma ray radiation.

Characteristically, electromagnetic radiation consists of electromagnetic waves, which are synchronized oscillations of electric and magnetic fields that multiply at the speed of light through a vacuum. Creating a transverse wave, the oscillations of the two fields are perpendicular to each other and perpendicular to the direction of energy and wave propagation. The electromagnetic spectrum could be portrayed by either its frequency of oscillation or its wavelength. In order of increasing frequency and decreasing wavelength, the electromagnetic spectrum includes radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays.



<https://mystreetmychoice.com/slides/img/hero/emr-propagation-960.jpg>

Figure GL.9 Electromagnetic Radiation (EMR)

E is the electric field; B is the magnetic field; and V is direction of the electromagnetic wave

- **Gauss**

Gauss, unit of magnetic induction in the centimeter-gram-second system of physical units. One Gauss corresponds to the magnetic flux density that will induce an electromotive force of one abvolt (10^{-8} volt) in each linear centimeter of a wire moving laterally at one centimeter per second at right angles to a magnetic flux. One Gauss corresponds to 10^{-4} Tesla (T), the International System Unit. The Gauss is equal to 1 Maxwell per square centimeter, or 10^4 Weber per square meter. Magnets are rated in Gauss. The Gauss was named for the German scientist Carl Friedrich Gauss.

Encyclopedia Britannica

- **Geodesic Motion/Curved Space**

If we envision an astronaut in his accelerating spaceship cabin and visualize him pointing a laser horizontally across the cabin, the upward motion of the spacecraft would result in the path of the laser appearing to curve very minimally downwards as it travels across the cabin. Now, it is posited that light always takes the shortest path between two points, which we usually think of as a straight line. However, a straight line is only the shortest distance between two points on a flat surface.

Alternatively on a curved surface, the shortest distance between two points is actually a curve, technically known as a geodesic, which we can picture when we think, for example, of a plane flying the shortest route between London and New York which, as travelers will know, follows a "great circle" path over Newfoundland rather than what appears to be a more direct straight line on a flat map.

The only conceivable explanation of the curving laser beam, then, is that the space inside the cabin is in some way curved. If we combine this concept with Einstein's principle of equivalence, then it would appear that light in the presence of gravity follows a curved trajectory, or, put in another way, gravity bends the path of light. In fact, it turns out that gravity is nothing more than curved space, or, in other words, the warpage of four-dimensional space-time.

A simple analogy might help us to understand this notoriously hard-to-visualize concept. If a group of ants spend their entire lives on the essentially two-dimensional surface of a trampoline, and a heavy weight like a bowling ball is placed in the middle of the trampoline, the ants will find their paths mysteriously bent towards the bowl-like depression in the trampoline. The ants might explain it by saying that the weight is exerting a force of attraction on them,

but, from the elevated point of view of the third dimension, it is clear that the ants are merely following the curve of the trampoline and that no actual force is acting on them.

An even better visual analogy might be if a marble is rolled along the trampoline surface. It might roll straight past the bowling ball, or it might be deflected a little (or a lot) as it follows the dip but then "escapes" (similar to the idea of using gravity to deflect or brake or slingshot a spaceship around a planet's orbit). Or, if the marble comes too close, then it might be drawn inexorably into the depression of the bowling ball, rolling in ever-decreasing circles until it joins the ball in its hollow. The path of the Earth as it travels through space is constantly bent towards the Sun in this way, so much so that the planet traces out a nearly circular orbit.

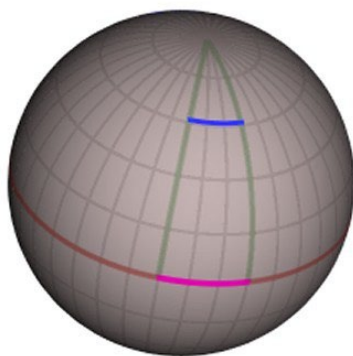
From the God-like perspective of the fourth dimension, however, it can be seen that there is no actual force being exerted on the Earth, merely that the Sun has created a valley-like depression in four-dimensional space, and the Earth is just following the shortest path along a geodesic through the curved space-time (just as the ants were in three-dimensional space).

The Earth, then, is actually in free fall around the Sun and so we do not feel the Sun's gravity on Earth, just as astronauts on the International Space Station in free fall around the Earth do not feel the Earth's gravity. Thus, although free fall is usually defined as motion with no acceleration other than that provided by gravity, what it is really is just a body travelling along the straightest possible path through space-time. We only "feel" gravity on the Earth when our natural motion of free fall towards the center of the Earth is thwarted by the ground, an inertial force similar to centrifugal force.

This may at first seem counter-intuitive. We are used to the Newtonian idea that, when we throw a ball straight up in the air, for example, a graph of its height versus time traces out a parabola curve. Under relativity, however, we must recognize that a massive body like the Earth actually curves the coordinate system itself, so that rather than following a curved path in a flat (Cartesian) coordinate system, the ball actually follows a minimum-distance path, or geodesic, in a curved coordinate system, returning to the thrower's hand at a later time because the geodesic leads it there.

The Physics of the Universe

https://www.physicsoftheuniverse.com/topics_relativity_curved.html



http://en.wikipedia.org/wiki/Introduction_to_general_relativity

Figure GL.10 Geodesic Motion/Curved Space [Fair Use]
A geodesic is the shortest path between two points in curved space.

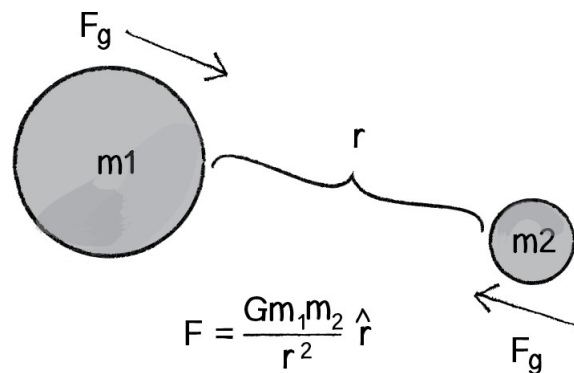
- **Gluon**

1. A gluon is an unobserved massless particle with spin 1 that is believed to transmit the strong force between quarks, binding them together into baryons and mesons. [Dictionary.com]
2. Gluon, the so-called messenger particle of the strong nuclear force, which binds subatomic particles known as quarks within the protons and neutrons of stable matter as well as within heavier, short-lived particles created at high energies. Quarks interact by emitting and absorbing gluons, just as electrically charged particles interact through the emission and absorption of photons.

Encyclopedia Britannica <https://www.britannica.com/science/gluon>

- **Gravitational Mass**

1. (Physics) The mass of a body as measured by its gravitational attraction for other bodies.
https://www.thefreedictionary.com/gravitational+mass
2. The property of a body that causes it to have weight in a gravitational field.
https://www.thefreedictionary.com/gravitational+mass

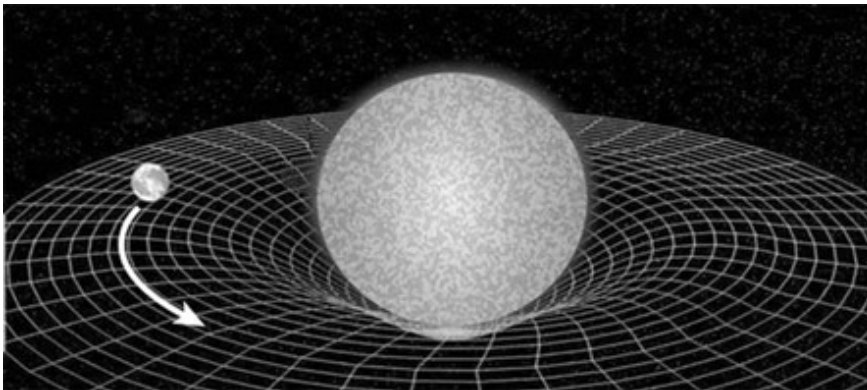


Gravitational attraction; khanacademy.org
http://bit.ly/2JdsCDR

Figure GL.11 Gravitational Mass [Fair Use]

- **GRT (General Relativity Theory)**

Albert Einstein's general theory of relativity is one of the greatest triumphs of 20th-century physics. Published in 1916, it explains that what we recognize as the force of gravity, in fact, arises from the curvature of space and time. Einstein posited that objects such as the Sun and the Earth change this geometry. In the presence of matter and energy space-time can evolve, stretch and warp, forming ridges, mountains and valleys that cause bodies moving through it to zigzag and curve. So, although Earth appears to be pulled towards the Sun by gravity, there is no such force. It is merely the geometry of space-time around the Sun telling Earth how to move.



http://www.uh.edu/jclarage/astr3131/lectures/4/einstein/Einstein_stanford_Page7.html

Figure GL.12 GRT [Fair Use]

• Homopolar Generator

A homopolar generator is a direct current (DC) electrical generator comprising an electrically conductive disc or cylinder rotating in a plane perpendicular to a uniform static magnetic field. Also, the homopolar generator is unique in that no other rotary electric machine can produce DC without using rectifiers or commutators.

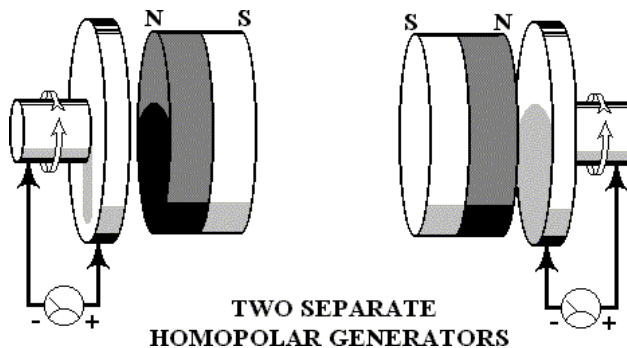


Figure GL.13 Two Separate Homopolar Generators, Wikipedia [Fair Use]

• Inertial Mass

The second law of motion states that if an unbalanced force acts on a body, that body will experience acceleration (or deceleration), that is, a change of speed. One can say that a body at rest is considered to have zero speed (a constant speed). So, any force that causes a body to move is an unbalanced force. Also, any force, such as friction or gravity, that causes a body to slow down or speed up, is an unbalanced force. This law can be shown by the following formula:

$$F = ma$$

F is the unbalanced force.

m is the object's mass.

a is the acceleration that the force causes.

Inertial mass is the mass of a body that represents its resistance to acceleration. This is the mass that appears in Newton's second law of motion.

If the units of force are in newtons, then the units of mass are kilograms and the units of acceleration are m/s^2 . If the units of force are in pounds (English), then the units of mass are in slugs, and the units of acceleration are ft/s^2 .

Motion of an object that is not accelerated (moving at a constant speed and in a straight line) can be found using the formula

$$d = v \times t$$

d is the distance traveled.

v is the rate of motion (velocity).

t is the time.

[National Aeronautics and Space Administration, contributed by Carol Hodanbosi]

- **Isotropy**

Isotropy means equal physical properties along all axes. [Dictionary.com]

- **Kinetic Energy**

1. Kinetic energy is the energy of motion, observable as the movement of an object, particle, or set of particles. Any object in motion is using kinetic energy: a person walking, a thrown baseball, a crumb falling from a table, and a charged particle in an electric field are all examples of kinetic energy at work. Objects that are not in motion possess potential energy (the other main type of energy), which is converted to kinetic energy when some force, such as gravity, acts upon the object to set it in motion. Elastic potential energy, for example, is stored in a stretched rubber band; when the rubber band is released, the stored energy is converted to kinetic energy. [WhatIs.com]
2. Kinetic energy is energy of motion. The SI unit for energy is the joule = newton x meter in accordance with the basic definition of energy as the capacity for doing work. The kinetic energy of an object is the energy it possesses because of its motion. The kinetic energy of a point mass m is given by

$$\text{Kinetic Energy} = \frac{1}{2} mv^2$$

3. Kinetic energy is an expression of the fact that a moving object can do work on anything it hits; it quantifies the amount of work the object could do as a result of its motion. The total mechanical energy of an object is the sum of its kinetic energy and potential energy. The total energy of an isolated system is subject to the conservation of energy principle.

For an object of finite size, this kinetic energy is called the translational kinetic energy of the mass to distinguish it from any rotational kinetic energy it might possess—the total kinetic energy of a mass can be expressed as the sum of the translational kinetic energy of its center of mass plus the kinetic energy of rotation about its center of mass.

<http://hyperphysics.phy-astr.gsu.edu/hbase/ke.html>

- **Law of Conservation of Energy**

By Anne Marie Helmenstine, Ph.D. (Updated May 06, 2019)

The law of conservation of energy is a physical law that states energy cannot be created or destroyed but may be changed from one form to another. Another way of stating this law of chemistry is to say the total energy of an isolated system remains constant or is conserved within a given frame of reference.

In classical mechanics, conservation of mass and conservation of energy are considered to be two separate laws. However, in special relativity, matter may be converted into energy and vice versa, according to the famous equation $E = mc^2$. Thus, it's more appropriate to say mass-energy is conserved. [ThoughtCo.com]

- **Conservation of energy**

Principle of physics according to which the energy of interacting bodies or particles in a closed system remains constant. The first kind of energy to be recognized was kinetic energy, or energy of motion. In certain particle collisions, called elastic, the sum of the kinetic energy of the particles before collision is equal to the sum of the kinetic energy of the particles after collision. The notion of energy was progressively widened to include other forms. The kinetic energy lost by a body slowing down as it travels upward against the force of gravity was regarded as being converted into potential energy, or stored energy, which in turn is converted back into kinetic energy as the body speeds up during its return to Earth. For example, when a pendulum swings upward, kinetic energy is converted to potential energy. When the pendulum stops briefly at the top of its swing, the kinetic energy is zero, and all the energy of the system is in potential energy. When the pendulum swings back down, the potential energy is converted back into kinetic energy. At all times, the sum of potential and kinetic energy is constant. Friction, however, slows down the most carefully constructed mechanisms, thereby dissipating their energy gradually. During the 1840s, it was conclusively shown that the notion of energy could be extended to include the heat that friction generates. The truly conserved quantity is the sum of kinetic, potential, and thermal energy. For example, when a block slides down a slope, potential energy is converted into kinetic energy. When friction slows the block to a stop, the kinetic energy is converted into thermal energy. Energy is not created or destroyed but merely changes forms, going from potential to kinetic to thermal energy. This version of the conservation-of-energy principle, expressed in its most general form, is the first law of thermodynamics. The conception of energy continued to expand to include energy of an electric current, energy stored in an electric or a magnetic field, and energy in fuels and other chemicals. For example, a car moves when the chemical energy in its gasoline is converted into kinetic energy of motion.

Encyclopedia Britannica <https://www.britannica.com/science/conservation-of-energy>

- **Lexicology**

A branch of linguistics concerned with the signification and application of words.

[*Miriam Webster Dictionary*]

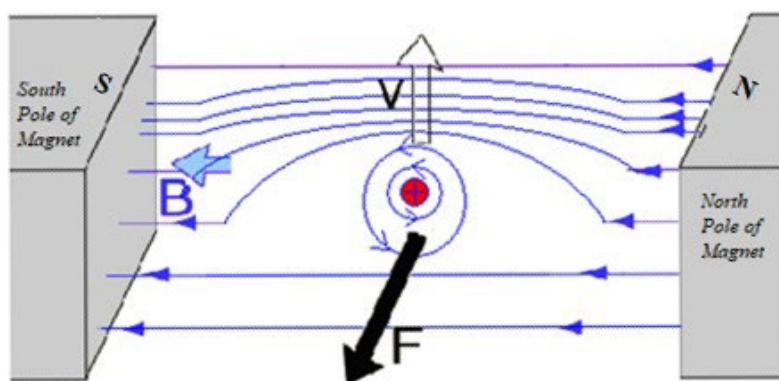
- **Lorentz Force**

Lorentz force, the force exerted on a charged particle q moving with velocity v through an electric field E and magnetic field B . The entire electromagnetic force F on the charged particle is called the Lorentz force (after the Dutch physicist Hendrik A. Lorentz) and is given by

$$F = qE + qv \times B.$$

The first term is contributed by the electric field. The second term is the magnetic force and has a direction perpendicular to both the velocity and the magnetic field.

<https://www.britannica.com/science/Lorentz-force>



<http://bit.ly/2S0fg0l>

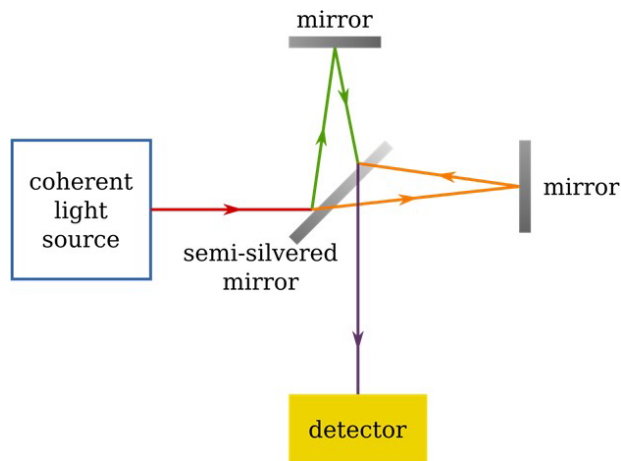
Figure GL.14 Lorentz Force [Fair Use]

B is the direction of the magnetic field; *v* is the direction of the + charged particle; and *F* is the direction of the resultant Lorentz force.

- **Meson**

Meson, any member of a family of subatomic particles composed of a quark and an anti-quark. Mesons are sensitive to the strong force, the fundamental interaction that binds the components of the nucleus by governing the behavior of their constituent quarks. Predicted theoretically in 1935 by the Japanese physicist Yukawa Hideki, the existence of mesons was confirmed in 1947 by a team led by the English physicist Cecil Frank Powell with the discovery of the pi-meson (pion) in cosmic-ray particle interactions. More than 200 mesons have been produced and characterized in the intervening years, most in high-energy particle-accelerator experiments. All mesons are unstable, with lifetimes ranging from 10^{-8} seconds to less than 10^{-22} seconds. They also vary widely in mass, from 140 mega-electron volts (MeV; 10^6 eV) to nearly 10 giga-electron volts (GeV; 10^9 eV). Mesons serve as a useful tool for studying the properties and interactions of quarks. [Encyclopedia Britannica]

- **MMX**



Wikipedia.com

Figure GL.15 MMX [Fair Use]

Michelson-Morley experiment, an attempt to detect the velocity of the Earth with respect to the hypothetical luminiferous ether, a medium in space proposed to carry light waves. First performed in Germany in 1880–81 by the physicist A.A. Michelson, the test was later refined in 1887 by Michelson and Edward W. Morley in the United States.

The procedure depended on a Michelson interferometer, a sensitive optical device that compares the optical path lengths for light moving in two mutually perpendicular directions. It was reasoned that, if the speed of light were constant with respect to the proposed ether through which the Earth was moving, that motion could be detected by comparing the speed of light in the direction of the Earth's motion and the speed of light at right angles to the Earth's motion. No difference was found. This null result seriously discredited the ether theories and ultimately led to the proposal by Albert Einstein in 1905 that the speed of light is a universal constant. [Encyclopedia Britannica]

- **NANRMS**

Non-Attracting/Non-Repulsion Magnetic Shield

Given the fact that this type of shield is constructed from an equal number of opposite-oriented magnetic poles, there is no overall effect exerted on a single externally placed permanent magnet (PM). In essence, this is a **non-attracting/non-repulsion magnetic shield** (NANRMS). For future reference, this form of shield will be labeled as (NANRMS).

A magnetic shield that neither attracts nor repels a solitary externally placed PM. On the other hand, it must be capable of reducing/diverting a magnetic field; such that it decreases the Lorentz forces of two repelling PMs, when placed on opposite sides of the plane of the shield. [Warfield]

- **Neodymium**

Neodymium is a chemical element and a rare-earth element with the symbol Nd and a atomic number 60 that belongs to the lanthanide series. It is a hard, slightly malleable silvery metal, that tarnishes quickly in air and moisture. When oxidized, neodymium reacts to produce pink, purple/blue, and yellow compounds in the +2, +3, and +4 oxidation state.

The element was discovered in 1885 by Austrian chemist Carl Auer von Welsbach and is now mined primarily in China. Neodymium is present in significant quantities in the ore minerals monazite and bastnaesite. Neodymium is not found naturally in metallic form or unmixed with other lanthanides, and it is usually refined for general use. Although neodymium is classed as a rare-earth element, it is fairly common, no rarer than cobalt, nickel, or copper, and is widely distributed in the Earth's crust.

Neodymium is also used with various other substrate crystals, such as yttrium aluminium garnet in the Nd:YAG laser. This laser usually emits infrared at a wavelength of about 1,064 nanometers. The Nd:YAG laser is one of the most commonly used solid-state lasers.

Another important use of neodymium is as a component in the alloys used to make high-strength neodymium magnets—powerful permanent magnets. [Source: *Wikipedia*]

- **Newton's Third Law**

1. Formally stated, **Newton's third law** is "For every action, there is an equal and opposite reaction." The statement means that in every interaction, there is a pair of forces acting on the two interacting objects. The size of the forces on the first object equals the size of the force on the second object. [ThePhysicsClassroom.com <http://bit.ly/2XcKCHI>]
2. Examples of Newton's 3rd Law. When you jump off a small rowing boat into water, you will push yourself forward towards the water. The same force you used to push forward will make the boat move backwards. When air rushes out of a balloon, the opposite reaction is that the balloon flies up. [<http://bit.ly/30fXXeE>]

- **Occam's Razor**

Occam's razor, also spelled Ockham's razor, stated by the scholastic philosopher William of Ockham (1285-1347/49) that principle gives precedence to simplicity. Or in other words of two competing theories, the simpler explanation of an entity is to be preferred. [*Encyclopedia Britannica, Britannica.com*]

- **Over Unity**

An over unity device should produce more energy than it receives as input. The term was coined to avoid patent rules that prevent seemingly impossible technologies (such as perpetual motion machines) being patented.

• Pendulum motion

A simple pendulum consists of a relatively massive object hung by a string from a fixed support. It typically hangs vertically in its equilibrium position. The massive object is affectionately referred to as the pendulum bob. When the bob is displaced from equilibrium and then released, it begins its back-and-forth vibration about its fixed equilibrium position. The motion is regular and repeating, an example of periodic motion. [ThePhysicsClassroom.com]

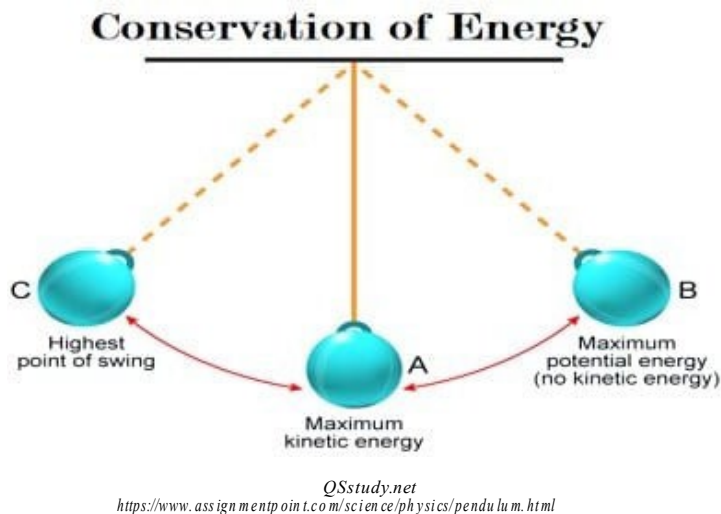


Figure GL.16 Pendulum Motion [Fair Use]

• Permalloy

Permalloy 80 is a highly magnetic nickel-iron-molybdenum alloy, with roughly 80% nickel and 15% iron and 5% molybdenum content. It's useful as a magnetic core material in electrical and electronic equipment. Commercial permalloy alloys typically have relative permeability of around 100,000, compared to several thousand for ordinary steel. It provides maximum magnetic permeability and minimal core losses at low field strengths. This vacuum-melted product also offers the advantages of small size and weight in magnetic core and shielding materials for the applications shown below. Other magnetic properties are near zero magnetostriction and significant anisotropic magnetoresistance.

[<https://www.espimetals.com/index.php/technical-data/175-permalloy-80>]

Photon

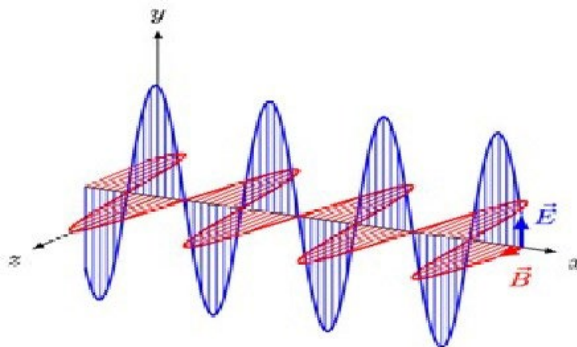
A **photon** is a particle of light defined as a discrete bundle (or quantum) of electromagnetic (or light) energy. Photons are always in motion and, in a vacuum (a completely empty space), have a constant speed of light to all observers. Photons travel at the vacuum speed of light (more commonly just called the speed of light) of $c = 2.998 \times 10^8 \text{ m/s}$.

Basic Properties of Photons

According to the photon theory of light, photons:

1. Behave like a particle and a wave, simultaneously.

2. Move at a constant velocity, $c = 2.998 \times 10^8 \text{ m/s}$ (i.e., "the speed of light"), in empty space.
3. Have zero mass and rest energy.
4. Carry energy and momentum, which are also related to the frequency (ν) and wavelength (λ) of the electromagnetic wave, as expressed by the equation $E = h\nu$ and $p = h/\lambda$.
5. Can be destroyed/created when radiation is absorbed/emitted.
6. Can have particle-like interactions (i.e., collisions) with electrons and other particles, such as in the Compton effect in which particles of light collide with atoms, causing the release of electrons. [ThoughtCo.com]



Wikimedia Commons

Figure GL.17 Photon [Fair Use]

Image shows alternating right-angled magnetic (B) and electric (E) fields. This in association with its given length, frequency, and amplitude, is the photon.

• PM - Permanent Magnet

Permanent magnets are materials where the magnetic field is generated by the internal structure of the material itself. Inside atoms and crystals, you have both electrons and the nucleus of the atom. Both the nucleus and the electrons themselves act like little magnets, like little spinning chunks of electric charge, and they have magnetic fields inherent in the particles themselves. There's also a magnetic field that's generated by the orbits of the electrons as they move about the nucleus. So the magnetic fields of permanent magnets are the sums of the nuclear spins, the electron spins, and the orbits of the electrons themselves. In many materials, the magnetic fields are pointing in all sorts of random directions and cancel each other out and there's no permanent magnetism. But in certain materials, called ferromagnets, all the spins and the orbits of the electrons will line up, causing the materials to become magnetic. This would be your normal iron, cobalt, nickel. Permanent magnets are limited by the structure of the material. And the strongest magnetic field of a permanent magnet is about 8,000 gauss. The strongest magnets at the national Magnet Lab are 450,000 gauss, which would be almost 50 times stronger than that.

[<https://nationalmaglab.org/about/maglab-dictionary/permanent-magnet>]

• Quantum Mechanics (QM)

Quantum mechanics is a theory of matter that is based on the concept of the possession of wave properties by elementary particles, that affords a mathematical interpretation of the structure and interactions of matter on the basis of these properties, and that incorporates within it quantum theory and the uncertainty principle. Also called wave mechanics.

[*Merriam Webster Dictionary*]

• Quark

1. A **quark** is any member of a group of elementary subatomic particles that interact by means of the strong force and are believed to be among the fundamental constituents of matter. Quarks associate with one another via the strong force to make up protons and neutrons, in much the same way that the latter particles combine in various proportions to make up atomic nuclei. There are six types, or flavors, of quarks that differ from one another in their mass and charge characteristics. These six quark flavors can be grouped in three pairs: up and down, charm and strange, and top and bottom. Quarks appear to be true elementary particles; that is, they have no apparent structure and cannot be resolved into something smaller. In addition, however, quarks always seem to occur in combination with other quarks or with antiquarks, their antiparticles, to form all hadrons—the so-called strongly interacting particles that encompass both baryons and mesons. [*Encyclopedia Britannica, Britannica.com*]
2. Quarks and electrons are the tiniest particles. There are three quarks in every proton and three in every neutron, and protons and neutrons are constituents of an atom. One cannot see a quark, even with an electron microscope, but we know they must exist since that's the only way to explain what happens when scientists do certain experiments.

[Quatr.us from Professor Carr <https://quatr.us/physics/quarks-nuclear-physics-science.htm>]

• Railgun

A railgun is basically a large electric circuit, made up of three parts: a power source, a pair of parallel rails and a moving armature. Let's look at each of these parts in more detail.

The power supply is simply a source of electric current. Typically, the current used in medium-to large-caliber railguns is in the millions of amps.

The armature bridges the gap between the rails. It can be a solid piece of conductive metal or a conductive sabot—a carrier that houses a dart or other projectile. Some railguns use a plasma armature. In this set-up, a thin metal foil is placed on the back of a non-conducting projectile. When power flows through this foil, it vaporizes and becomes plasma, which carries the current.

Here's how the pieces work together:

An electric current runs from the positive terminal of the power supply, up the positive rail, across the armature, and down the negative rail back to the power supply.

Current flowing in any wire creates a magnetic field around it—a region where a magnetic force is felt. This force has both a magnitude and a direction. In a railgun, the two rails act like wires, with a magnetic field circulating around each rail. The force lines of the magnetic field run in a counterclockwise circle around the positive rail and in a clockwise circle around the negative rail. The net magnetic field between the rails is directed vertically.

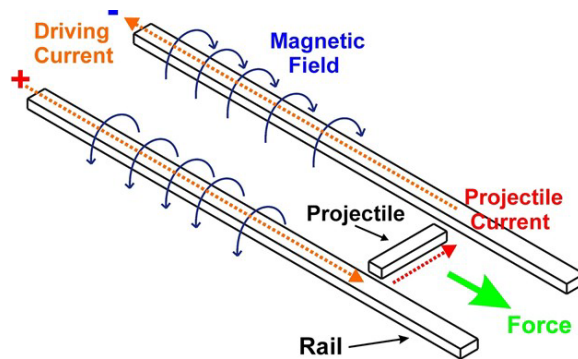
Like a charged wire in an electric field, the projectile experiences a force known as the Lorentz force (after the Dutch physicist Hendrik A. Lorentz). The Lorentz force is directed

perpendicularly to the magnetic field and to the direction of the current flowing across the armature. You can see how this works in the diagram below (Figure GL.18).

Notice that the Lorentz force is parallel to the rails, acting away from the power supply. The magnitude of the force is determined by the equation $F = (i)(L)(B)$, where F is the net force, i is the current, L is the length of the rails, and B is the magnetic field. The force can be boosted by increasing either the length of the rails or the amount of current.

Because long rails pose design challenges, most railguns use strong currents—on the order of a million amps—to generate tremendous force. The projectile, under the influence of the Lorentz force, accelerates to the end of the rails opposite the power supply and exits through an aperture. The circuit is broken, which ends the flow of current.

How Stuff Works <https://science.howstuffworks.com/rail-gun1.htm>

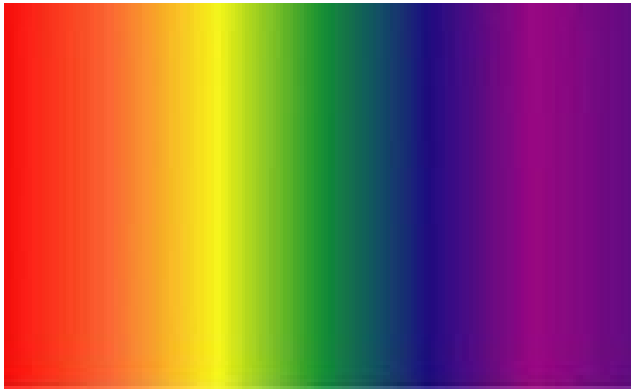


<https://www.doityourselfgadgets.com/2013/10/homemade-railgun.html>

Figure GL.18 Railgun [Fair Use]

- **Redshift / Blueshift**

What Are Redshift and Blueshift? By Elizabeth Howell, Space.com Contributor, May 2, 2014
Share Tools



Credit: NASA

Figure GL.19 Redshift/Blueshift [Fair Use]
The visible light spectrum

Redshift and blueshift explain how light changes as objects in space (such as stars or galaxies) move closer or farther away from us. The conception is key to charting the universe's expansion.

Visible light is a spectrum of colors, which is apparent to anyone who has observed a rainbow. When an object moves away from us, the light is shifted to the red end of the spectrum, as its wavelengths get longer. If an object moves closer, the light moves to the blue end of the spectrum, as its wavelengths get shorter.

To think of this more clearly, imagine yourself listening to a police siren as the car rushes by you on the road. Everyone has heard the increased pitch of an approaching police siren and the sharp decrease in pitch as the siren passes by and recedes. The effect arises because the sound waves arrive at the listener's ear closer together as the source approaches, and further apart as it recedes.

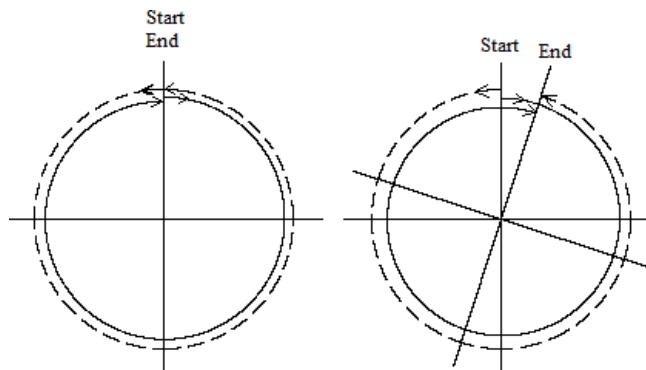
American astronomer Edwin Hubble was the first to describe the redshift phenomenon and tie it to an expanding universe. His observations, revealed in 1929, showed that nearly all galaxies he observed are moving away. This phenomenon was observed as a redshift of a galaxy's spectrum. "This redshift appeared to be larger for faint, presumably further, galaxies. Hence, the farther a galaxy, the faster it is receding from Earth. The galaxies are moving away from Earth because the fabric of space itself is expanding. While galaxies themselves are on the move—the Andromeda Galaxy and the Milky Way, for example, are on a collision course—there is an overall phenomenon of redshift occurring, as the universe expands. The terms redshift and blueshift apply to any part of the electromagnetic spectrum, including radio waves, infrared, ultraviolet, X-rays, and gamma rays."

Three types of redshift

At least three types of redshift arise in the universe—from the universe's expansion, from the movement of galaxies relative to each other and from "gravitational redshift," which transpires when light is shifted due to the massive amount of matter inside of a galaxy. [Space.com]

- **Sagnac Effect**

If two pulses of light are sent in opposite directions around a stationary circular loop of radius R , they will travel the same inertial distance at the same speed, so they will arrive at the end point simultaneously. This is illustrated in the left-hand figure below.



sensors:gyroscope [SensorWiki.org]; Canadian journal of physics

Figure GL.20 Sagnac Effect [Fair Use]

The figure on the right indicates what transpires if the loop itself is rotating during this procedure. Obviously, the pulse traveling in the same direction as the rotation of the loop must travel a slightly greater distance than the pulse traveling in the opposing direction, due to the angular displacement of the loop during the transit. As a result, if the pulses are emitted simultaneously from the "start" position, the counter-rotating pulse will arrive at the "end" point slightly earlier than the co-rotating pulse. [Mathpages.com]

- **Stellar Aberration**

Stellar aberration is an apparent shift in the observed position of a star compared with the position stated in the catalogue, due both to the finite nature of the speed of light and to the motion of the observer relative to the stars. Stellar aberration is divided into annual aberration and diurnal aberration.

The aberration of light (also referred to as astronomical aberration, stellar aberration, or velocity aberration) is an astronomical phenomenon, which produces an apparent motion of celestial objects about their true positions, dependent on the velocity of the observer. Aberration causes objects to appear to be displaced towards the direction of motion of the observer compared to when the observer is stationary. The change in angle is typically very small—of the order of v/c where (c) is the speed of light and v the velocity of the observer. In the case of "stellar" or "annual" aberration, the apparent position of a star to an observer on Earth varies periodically over the course of a year as the Earth's velocity changes as it revolves around the Sun, by a maximum angle of approximately 20 arc-seconds in right ascension or declination.

The term *aberration* has historically been used to refer to a number of related phenomena concerning the propagation of light in moving bodies. Don't confuse aberration with *parallax*. The latter is a change in the apparent position of a relatively nearby object, as measured by a moving observer, relative to more distant objects that define a reference frame. The amount of parallax depends on the *distance* of the object from the observer, whereas aberration does not.

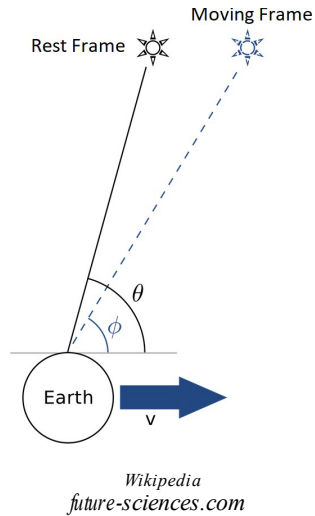


Figure GL.21 Stellar Aberration [Fair Use]

The apparent position of a star viewed from the Earth depends on the Earth's velocity. The effect is typically much smaller than illustrated.

• **Stellar Parallax**

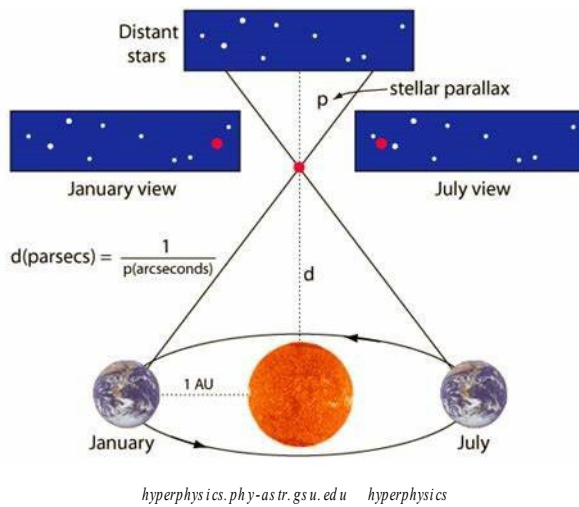


Figure GL.22 Stellar Parallax [Fair Use]

When viewed from the position of the sun (large central red mottled ball), the distant object (smaller red oval) appears to be in the center of the rectangle of stars. Alternatively when viewed from Earth, its position changes with respect to those same stars (rectangle), moreover, January different from July (using trigonometry).

What Is Parallax

By Jim Lucas, Space.com Contributor, August 29, 2015

Share Tools

Astronomers use a technique called parallax to precisely measure the distance to stars in the sky. Using the technique, which requires observing targets from opposite sides of Earth's orbit around the Sun, astronomers have pinpointed the distance to the famed "Seven Sisters" star cluster, the Pleiades. See photo below. [*Space.com*]

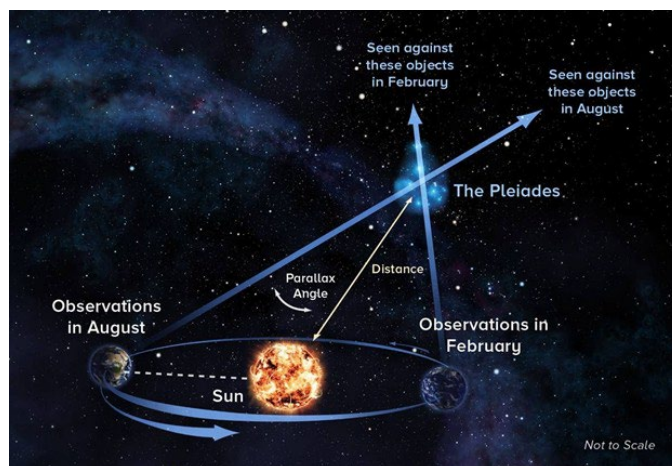


Figure GL.23 Stellar Parallax [Fair Use]

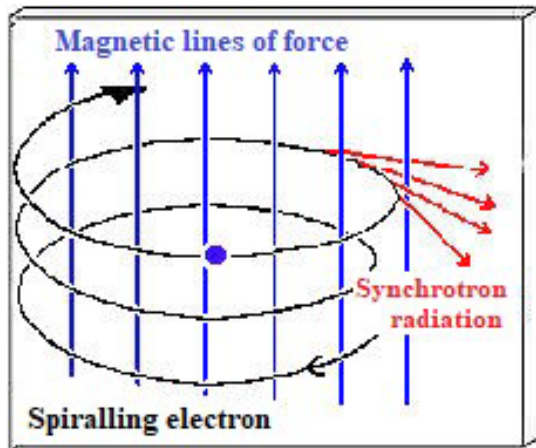
- **Substance**

A substance is matter which has a specific composition and specific properties. Every pure element is a substance. Every pure compound is a substance. [*Chemicool Dictionary chemi-cool.com*]

- **Synchrotron Radiation**

Synchrotron radiation is emitted by charged particles, usually electrons, moving at relativistic speeds in magnetic fields. In a magnetic field, a charged particle is forced to circle around the field line in a helical path. An accelerating charged particle emits electromagnetic radiation that is radiated along the direction in which the particle is moving. A large population of relativistic particles moving in a magnetic field will radiate over a wide range of frequencies and has a high degree of polarization.

[<http://universe-review.ca/R05-02-synchrotron.htm>]



<http://universe-review.ca/R05-02-synchrotron.htm>

Figure GL.24 Synchrotron Radiation [Fair Use]

• VMF (Velocity Magnetic Field)

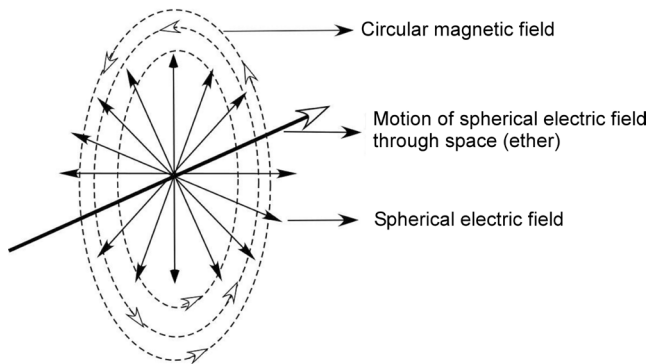


Figure GL.25 VMF (Velocity Magnetic Field) [Fair Use]

Electrons possess two forms of magnetic fields. The first is related to the electron's intrinsic spin within the ether (up down). This is a function of EMR spinning upon itself, therefore, transforming into an electron (electric field). The second is a function of the electron's velocity, with regard to the ether of PFSRT (Chapter 1). For future reference, these two categories of magnetic fields will be defined as, first, the spin electromagnet field (SMF) and second, the velocity magnetic field (VMF).

- **Wavefront**

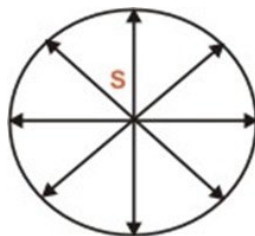
1. Wavefront is defined as the locus of all the particles of a medium vibrating in the same phase at a given instant. The phase difference between any two points situated on the same wavefront is zero; the shape of a wavefront depends upon the shape of the source of disturbance. [assignmenthel p.net <http://bit.ly/2NfvrZ5>]

2. A wavefront is a surface or line in the path of wave motion on which the disturbances at every point have the same phase.

Depending upon the source of light, wavefronts can be of three types, spherical wavefront, cylindrical wavefront, or plane wavefront.

Spherical Wavefront

If a point source in an isotropic medium is sending out waves in three dimensions, the wavefronts are spheres centered on the source as shown in Figure GL.26 below. Such wavefront is called a spherical wavefront.



<http://www.physicshandbook.com/topic/topicw/wavefront.htm>

Figure GL.26 Spherical Wavefront [Fair Use]

Cylindrical Wavefront

When the source of light is linear, all the points equidistant from the linear source lie on the surface of a cylinder as shown in figure. Such a wavefront is called a cylindrical wavefront.

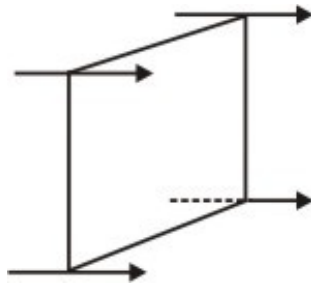


<http://www.physicshandbook.com/topic/topicw/wavefront.htm>

Figure GL.27 Cylindrical Wavefront [Fair Use]

Plane Wavefront

At a large distance from a source of any kind, the wavefront will appear plane as shown in figure. Such a wavefront is called plane wavefront.



<http://www.physicsandbook.com/topic/topic/wavefront.htm>

Figure GL.28 Plane Wavefront [Fair Use]

Here is an example of a wavefront An explosion located at a central point in the atmosphere resulting in a pressure wave radiating from its origin. The leading edge of the pressure wave is the wavefront.