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Ethereal Mechanics: Electrogravity

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ABSTRACT

This paper introduces an underlying physical system from which matter, electricity, magnetism, gravity and all other phenomena of existence are synthesized. This system is called Pretonics.

In this paper, the following are derived from Pretonics

1. Gravitational Constant G
2. Electric Field Constant ε
3. Magnetic Field Constant μ (True meaning revealed)
4. Mass (Inertia) of an Electron
5. The Electric Field (Coulomb's "Law", Coulomb Field)
6. The Magnetic Field
7. The Small Scale Gravity Model (Large Scale Model derived in Cosmology paper [EM05])
8. Einstein's Energy Model $E = MC^2$
9. Others

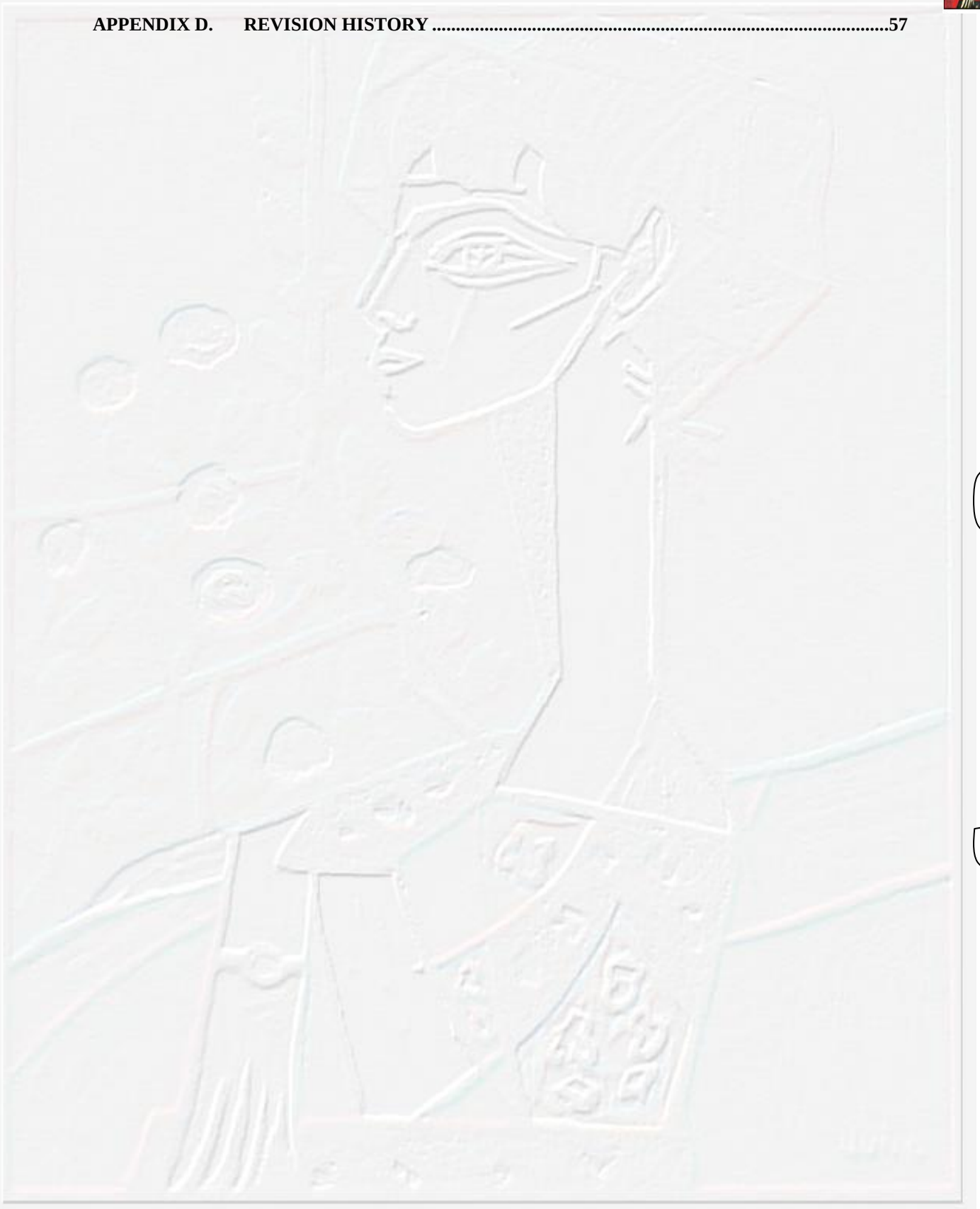
Pretonics is a system of inertia-less charge particles called Pretons which emit fields called Pretonic fields. Stable matter is synthesized by two or more Pretons orbiting each other in such a manner that the Pretonic forces balance. The behavior of Pretons, moving about each other to form stable matter and synthesize all the known properties of matter to include mass, energy, gravity, electricity, magnetism, etc.

All fields are generated from Pretons interacting with a medium. It is realized that scientists have a general aversion to the concept of a medium; however, this aversion is hypocritical because all modern sciences employ some form of medium that fills free space. Relativity has its "Fabric of Space Time" and "Dark Matter"; Quantum Mechanics has "Quantum Foam" and "Zero Point Energy". Therefore, it is quite appropriate to describe a medium for free space even if it is considered just an abstraction.

Ethereal Mechanics proposes a medium that resolves the deficiencies of the Luminiferous Aether model from antiquity (the Michelson-Morley era) and is referred to by the generic term "Ether" or sometimes just medium. In this paper, the Small Scale Ether (SSE) model is introduced which is sufficient for experiments of the laboratory scale down to the subatomic scale. The follow-on paper "Ethereal Mechanics: Cosmology" [EM05] develops the Large Scale Ether (LSE) model that properly predicts Stellar Aberration, the precession of Mercury and galactic behaviors without the need for dark matter.

The major drawback of this theory is its simplicity. Consider that thousands of scientists, struggling for over a century and spending billions of research dollars, have not been able to unify gravity and electromagnetism. The reasonable assumption is that the solution is beyond our current efforts and far more complicated or strange. It can't be simple; otherwise, it would have been found by now.

Ethereal Mechanics



1 Introduction

This introduction provides a synopsis of Electrogravity and the foundational papers that support Electrogravity in order to establish context and prerequisites. The basis of Electrogravity is Pretonics. The science of Pretonics is in the early stages of development as of this version (1.0) of Electrogravity. Bits and pieces are known and the rest is filled in with temporary abstractions. This early model of Pretonics is known as the Simplified Pretonic model. The simplified model unifies gravity with electromagnetism and unifies the small scale and the large scale which is far beyond the capabilities of Einstein's Relativity or Quantum Mechanics.

This section also defines the process by which the missing pieces of Ethereal Mechanics are to be developed. This process of refining Ethereal Mechanics is described in more detail in section 1.2.

For those who wish to jump right into the hard core mathematics, skip to section 4, Pretonics.

1.1 Synopsis

Electrogravity is built upon two Ethereal Mechanic constructs. The first is the Small Scale Ether (SSE) model and the second is Pretonics (The simplified model for now)

The Science of Pretonics includes inertia-less charge particles called Pretons which emit fields called Pretonic fields. Pretons exist in a medium similar in concept to the Luminiferous Aether (Aether) from antiquity, except that the new model (Ether) does not suffer from the deficiencies that led to the abandonment of the legacy Aether model. These deficiencies are explored when the Large Scale Ether model is introduced in the follow-on paper titled "Ethereal Mechanics: Cosmology" [EM05]. To be clear, the large scale effects are present at the small scale; however, they are too insignificant to consider.

All fields are expressed as states of the medium while the medium itself serves as a form of primordial fuel consumed by Pretons. The waste products of Ether consumption are field emissions which govern the interactions between particles. These interactions result in the existence of matter and all observable properties of matter to include "mass", "energy", "time dilation", etc. These phenomena are in quotes because they manifest differently than conventional science would have one believe.
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The existence of stable matter requires the sustained consumption of a fuel which is the Ether. This is analogous to a helicopter maintaining a stable position in the air by consuming fuel at a sustained rate, or a street light that maintains a stable cone of light by consuming electric power at a sustained rate (the Emission-Consumption Paradigm). This fueled matter paradigm eliminates a glaring hypocrisy of science; wherein, scientists are vehemently opposed to the idea of a perpetual motion machine; yet, their primitive models of matter are perpetual motion machines comprised of material that must perpetually exist; otherwise, conservation laws would be violated. In this paper, conservation of energy is used to prove that matter must feed to exist.

Perpetuity infractions are also codified in Newton's First Law as well as General Relativity; these infractions (and more) are resolved in the follow-on paper "Ethereal Mechanics: Cosmology" [EM05] where the Large Scale Gravity (LSG) model is developed. The Large Scale Gravity model demonstrates extremely small interactions that only produce noticeable effects for large scale application. The large scale is galactic distances and times; as well as, intense gravitational divergences near stars and black holes.

This paper demonstrates the origin of a gravitation field from one object and the coupling of that field, as a force, to another object (the Field-Force paradigm). Because the distances and masses involved are no larger than what can exist in an earthbound laboratory, the large scale effects mentioned above do not materially affect the field between the two objects; thereby, allowing the use of the Small Scale Ether (SSE) model. Using the SSE model in conjunction with Pretonics, results in the Small Scale Gravity (SSG) model. The SSG converges on Newton's Model of gravity when the field and force models are combined.

Ethereal Mechanics derives the constant G from the behavior of a model of matter (MOM) based on a second order system of Pretons (SOSOP). In contrast, General Relativity (GR) and Newton's Model of Gravity (NMG), which are dependent upon the constant G, have absolutely no conceptual understanding of the constant G and employ it only as an arbitrary constant of relation (ACOR) needed to obtain the correct answers. Models that contain ACORs are nothing more than empirical models [ROA24] masquerading as real science. Now that Ethereal Mechanics can explain the origin of G, it is no longer arbitrary.

The explanation of gravity begins by considering that matter must consume Ether to exist. The consumption of Ether causes a depletion of Ether in the locality of the matter. Ether, like any fluid, accelerates from high concentrations toward lower concentrations. This acceleration of Ether toward a massive body is a gravitational field.

The acceleration of matter relative to the medium produces an inertial force. The force of Inertia is also the force of Gravity because it does not matter whether matter accelerates relative to the medium (Inertia) or the medium accelerates relative to matter (Gravity). Again, the field of gravity and the force of gravity are two separate phenomena. This separation of phenomenon into field and force is known as the Field-Force paradigm. This paradigm was first used in classical magnetism where the Biot-Savart model is the field model and the Lorentz model (F=QvxB) is the force model. It is an objective of Ethereal Mechanics to decompose all interactions into force and field when the opportunity presents itself.

Note: The Large Scale Ether model discusses how fields and emissions are distorted from passing through large scale effects such as extreme distances or extreme gravitational conditions. At the present time, it is believed that the large scale effects do not affect the coupling, or emissions, of fields.

The Field-Force Paradigm is discussed in the previous paper "Ethereal Mechanics: Constructs" [EM02]. The Ethereal consumption model of gravity was originally published in the paper New Gravity [NG] which is a foundational document to Ethereal Mechanics (though it is obsolete in some aspects).

The next section delves into the Ethereal Mechanics Refinement Process

1.2 The Refinement Process

All branches of science are incomplete. Incompleteness comes in many forms such as, arbitrary constants that can't be explained, dark matter which can't be found, paradoxes and so on. Ethereal Mechanics is also incomplete. This section details an iterative process to flush out the missing pieces in order to bring Ethereal Mechanics to completion as fast as possible. This is called the refinement process.

This paper is Ethereal Mechanic Version 1.0 which is based on the Simplified Pretonic Model and the Small Scale Ether model which are mostly abstractions. After an iteration of the refinement process, more complete models, which have fewer abstractions, result in Electrogravity Version 2.0. More iterations of the refinement process are executed until all the pieces of the puzzle fall into place.

The process is essentially to take the models as far as they can go toward the large scale, see Figure 1-1, and improve them to explain as many phenomena as possible. This is the first iteration and is the subject of the present paper and its follow-on papers. Then use the improved models to go toward the small scale to infer any underlying constructs as possible. Then take these new constructs back to the large scale to reconcile any further improvements. This would be the second iteration. Repeat this process as many times as needed until no anomalies are present or a practical means of faster than light starship propulsion pops out (that's my exit condition).

The rest of this section restates the above paragraph in exhausting detail. More importantly, all of the components of Ethereal Mechanics are discussed and how they relate to each other and the universe.

1.2.1 The Refinement Process in Detail

Figure 1-1 represents a block diagram of Electrogravity. The grey block at the bottom represents the foundational components which are common to all the constructs of Ethereal Mechanics. The light green block to the left represents the Simplified Pretonic model which is the basis for Version 1 (one) of Electrogravity. This section shows the process whereby the Pretonic and Ether models are refined to result in Electrogravity Version 2.

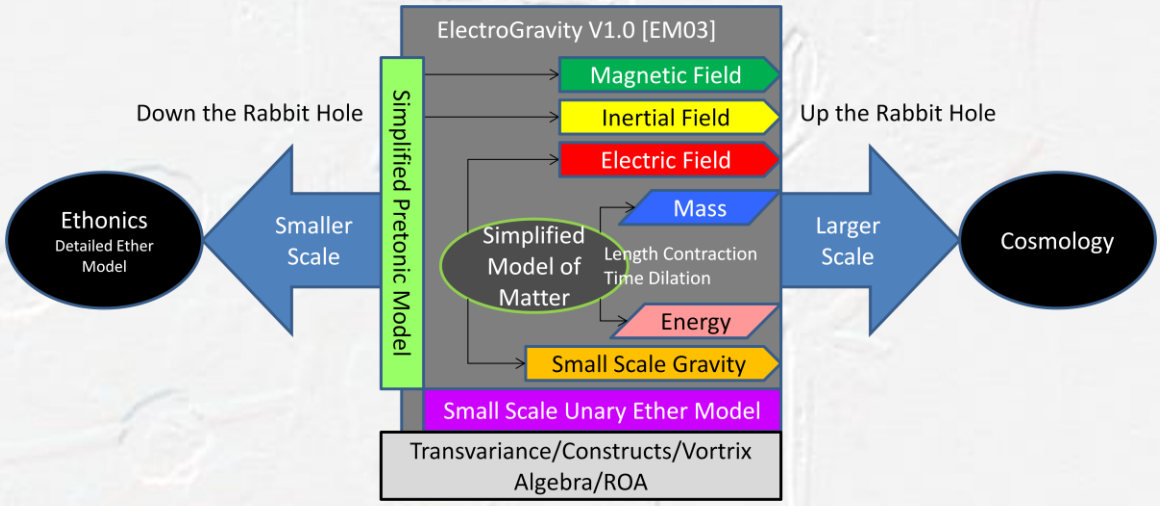


Figure 1-1: Electrogravity Relationship within the Ethereal Mechanics Framework

In Version 1 of Electrogravity, the Simplified Pretonic Model (SSM) and the Small Scale Ether (SSE) model are used to develop a simplified model of matter. From there, all the properties of matter and observable fields are developed.

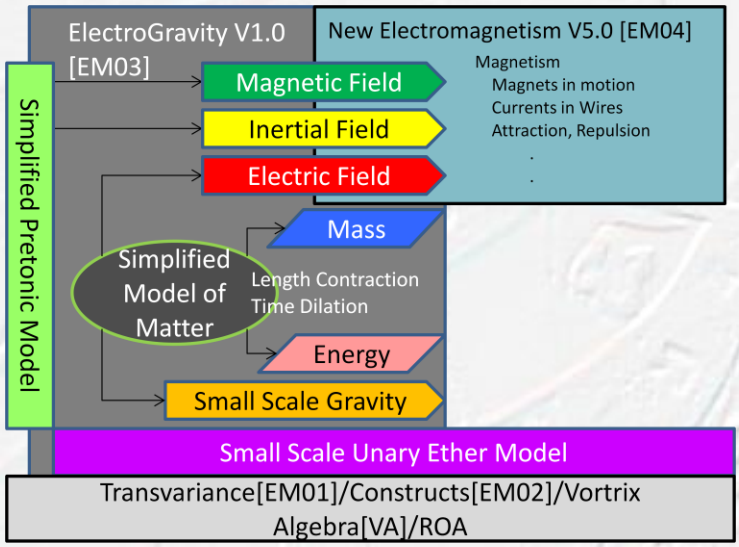


Figure 1-2: Evolution Step 2: Validation of New Electromagnetism

The next step, shown in Figure 1-2, is New Electromagnetism (presently Version 5) wherein; the Electric, Magnetic, and Inertial field models are experimentally verified and formatted for engineering applications. This is released in the paper titled "Ethereal Mechanics: New Electromagnetism V5" [EM04] which is next in production.

Next is "Ethereal Mechanics: Cosmology" [EM05] which is shown in Figure 1-3. Cosmology couples Gravity, Energy and "Mass" with the Large Scale Ether model to develop the Large Scale Gravity model. Then the large scale models are applied to phenomena such as black holes and galaxies and the like. Again, the Pretonic models are refined as needed.

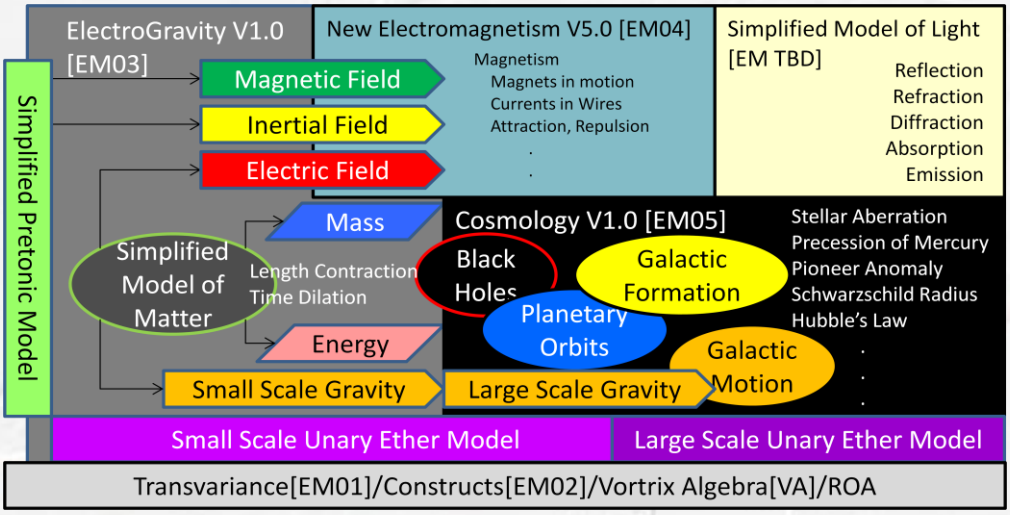


Figure 1-3: Evolution Step 3: Validation of Large Scale

This completes the upward swath of the iteration. It is not expected that everything is explained on the first iteration, they key is to explain a little bit more with every iteration by improving the Pretonic model. With a more complete Pretonic model, the downward swath is performed which goes toward the lower scale, down the rabbit hole to improve the Ethonic models (Figure 1-4).

Ethonics is the particle model of Ether. Ether particles are called Ethons. In all previous discussions, the Ether is modeled as a unary fluid. Presently only bits and pieces of Ethonics are known. One such known property is that Ether must be a binary fluid composed of positive and negative Ethons. The binary nature is inferred because the propagation of light is transverse in nature and all other known transverse waves propagate at the boundary between two dissimilar mediums. This implies that positive and negative Ethons are dissimilar by more than the sign of their charge.

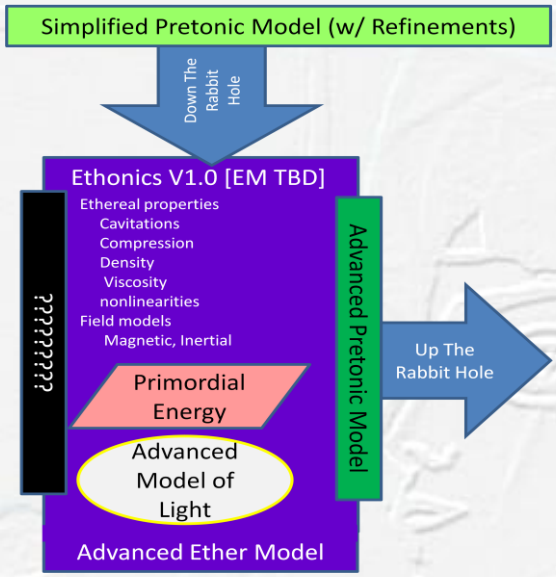


Figure 1-4: Evolution Step 4: Down the Rabbit Hole

Ethonics is the "Holy Grail" of Ethereal Mechanics. It is Ethonics that will contain the answers to the important questions:

1) How are Pretonic fields manifested in the Ether?
2) Can Ether be deliberately manipulated to produce artificial gravity or propulsion?
3) Are there other useful field phenomena?
4) How do Pretons interact with Ether? How do they feed?
5) How can the Ether be tapped to do work?
6) Is there a workaround for FTL Travel?
7) What exists below the scale of Ethons? (The ??????? to the left above)
8) Other questions that we may have no concept of.

After improving Ethonics by resolving some of the missing pieces, the refinement process uses the improved models to derive back up the Rabbit Hole (see Figure 1-5) to affect any changes in the larger constructs of Electrogravity, Electromagnetism, Cosmology, etc. From the updates of the larger constructs, any refinements in the Pretonic models are gathered and the whole process repeats. This iterative process continues until no missing pieces or unexplained anomalies remain.

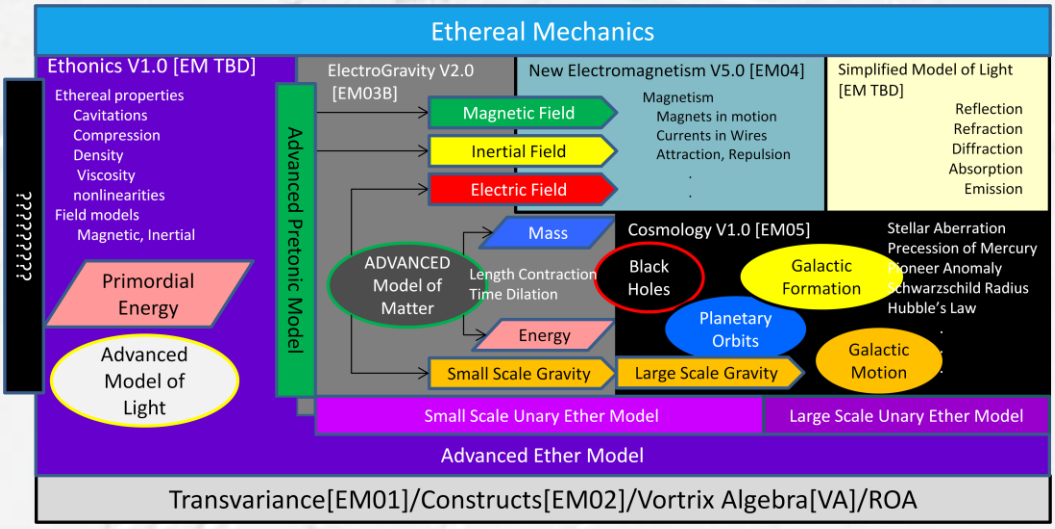


Figure 1-5: Evolution Step 5: Regress the Advanced Models

Each time a construct is revised, its version number is incremented.

1.2.2 Ethereal Mechanics Versions

Because of the iterative process of refining Ethereal Mechanics, it becomes necessary to track which version of the constructs belong to which version of Ethereal Mechanics.

The concept of Ethereal Mechanics formed in the late 1990s around the paper New Gravity [NG] and culminated with more advanced unary Ether models in the EMV video series on YouTube in the 2010s. In this early state of the science, there were many important realizations. One important realization was that matter must feed to exist and that this feeding was the cause of Ethereal depletion resulting in a gravitational field. Another realization is that induction was both the force of gravity and inertia etc. Missing was a coherent Pretonic field model and a clear way to tie gravity to Preton feeding.

Ethereal Mechanics identifies Version by a V number. For example New Electromagnetism Version 5 is called New Electromagnetism V5 or NE5 for short. Version numbers reference the iteration of the theory or model. Version numbers also include revision numbers as a decimal fraction. Revision numbers refer only to additions or corrections that do not change the overall models or theories. For example, the Vortrix Algebra paper is presently version 1.3. This means that Vortrix Algebra has not changed; however, the paper was revised three times since the initial release (V1.0) to correct typographical errors, add language to make a topic clearer or to release additional material that supports the present version of the theory or model. Any change to a paper that affects papers derived from it, requires a version change.

Each iteration of Ethereal Mechanics is composed of different versions of the components.
The following lists contain the present Ethereal Mechanics versions with their component versions.

Ethereal Mechanics Iteration 1 (c1999 to c2020)

- New Electromagnetism V3 [NE3]
- New Gravity [NG]
- YouTube EMV video Series [Ref needed]
- Rules of Acquisition V3
- Legacy Vector Algebra
- Legacy Physical Units

Ethereal Mechanics Iteration 2 (this version)

- New Electromagnetism V5, NE5, [EM04]
- Electrogravity V1, EG1 [EM03]
- Cosmology V1 [EM05]
- Vortrix Algebra V1 [VA]
- Constructs V1 [EM02]
- Transvariance V1 [EM01]
- Rules of Acquisition V4

2 Foundation

Ethereal Mechanics is built upon an improved scientific foundation. This foundation includes an improved version of vector algebra called Vortrix Algebra, which provides a complete vector product and quotient. An improved set of scientific units that are more closely aligned to natural constructs; providing a less obscured view of natures underlying constructs. And a set of scientific rules that provide a higher degree of scrutiny to scientific logic, theories and models.

This paper is written such that the concepts presented are easy enough to understand without the need to read the foundational papers. Those who wish to apply Ethereal Mechanics to engineering applications, or to analyze experimental observation, should become proficient with the foundational papers.

The foundation comprises the first two Ethereal Mechanics papers [EM01, EM02] as well as the mathematical framework of Vortrix Algebra [VA] and the Scientific Rules of Acquisition [ROA].

A brief introduction of each follows.

2.1 The Scientific Rules of Acquisition

The Scientific Rules of Acquisition [ROA] are a set of aphorisms that were added to the early Ethereal Mechanics YouTube videos to add a bit of levity. The Rules of Acquisition evolved into a serious collection of Rules, Tells, Imperatives, and Fallacies that became instrumental in achieving forward progress in Ethereal Mechanics by identifying flawed scientific constructs, avoiding flawed human thinking and most importantly, determining what characteristics a Theory of Everything (TOE) should have.

As of this writing, the 4th Edition of the Rules of Acquisition is nearing completion. The earlier editions were never completed because the rules kept evolving; furthermore, the means of classifying, organizing and presenting the rules evolved as well. The 4th Edition has remained stable long enough that a paper is in the works.

Because there is no document to reference at this time, the Rules referenced in this paper are presented here in a very brief format. In some cases, the rules may show links to YouTube videos that are likely from older editions that may have differences in the numbering, or in the final structure of the aphorisms, but the logic is sound.

1: The Correct Answer Fallacy

Obtaining a correct answer from a theory, model or other such tool of science (construct) does not mean the construct represents a "Law" of nature. These constructs are nothing more than a means to mimic what we observe (monkey see; monkey mimic). Just because humans can mimic something does not mean they understand it (See ROA3). It is possible to obtain correct answers from many different constructs, even those based on complete fantasy. Even a broken clock is correct twice a day.

"Logically, no number of positive outcomes at the level of experimental testing can confirm a scientific theory, but a single counter example can show a theory to be false." – Karl Popper

1.0 Correct answers prove nothing; except, utility (usefulness)
1.1 To prove a theory true requires infinite observations; more practical to assume all theories are wrong
1.2 Useful theories do not need to be true; just sufficient for the tolerance and scope of the application
1.3 Scientific advancement is the replacement of wrong theories with more subtly wrong theories.

2: The Anomaly Tell

Anomalies are the most basic indicator (Tell) that present scientific constructs are in some way wrong. Some may argue that a theory could merely be incomplete; however, incompleteness is a condition of wrongness.

An anomaly is a mismatch between a scientific model/theory and observed phenomenon. One form of anomaly occurs when a scientific theory obtains the wrong answer. An example of this is the equation for intrinsic (some say internal) inductance of a conductor. This model has been in text books for over a century and was proven wrong in the Foundational videos [FOUND]. Another mismatch occurs when a model/theory fails to explain a phenomenon outright. An example of this found in General Relativity. Einstein postulated, in his famous Principle of Equivalence, that gravity and inertia were equivalent; however, the gravitational model of General Relativity fails to explain inertia.

The largest problem in science is small anomalies because they are typically unknown or ignored when a new theory is crafted. Later, when a theory is elevated to "Irrefutable Law of Nature" status, these anomalies are trivialized or brushed aside in a blather of incomprehensible scientific gibberish. No one wants to be the guy (like Galileo) to go against age-old, institutionalized, theory over a tiny little anomaly. For this reason many anomalies persist to this day.

Beware; even the smallest anomaly can be the harbinger of catastrophic change. It does not matter how subtle the anomaly is, don't ignore it. If scientific progress can be made by sidestepping it, then do it, but don't forget about it. A Theory of Everything cannot have a single anomaly.

2.0 Anomalies are the mother of discovery(scientific progress); necessity is the mother of invention (technological progress).
2.1 A single counter example proves a construct wrong; not useless.
2.2 The more subtle the anomaly, the more radical may be the change to reconcile it.
2.3 The more subtle the anomaly, the longer it will be ignored.

3: The Utility Fallacy

Monkey do; does not mean monkey know. This is the simple way of saying that just because humans can produce technological marvels does not prove that the models and theories used in the development of these marvels is an accurate reflection of the underlying mechanisms of nature. Consider that humans have used fire for over 100,000 years to heat their homes, cook food, kill and destroy; however, it was not until about 200 years ago that it was understood that fire was a chemical reaction. And only about 100 years ago did they learn that chemical reactions are governed by the structures of atoms. But that's as far as they have gotten with it. Without a theory of everything, there is still no understanding of the underlying cause of fire.

Humans were able to optimize the recipe for gun powder (black powder) without any knowledge of chemistry. They were even able to devise ways (corning) to control burn rates to make firearms more reliable.

Parrots are able to mimic human words; it does not prove they understand what those words mean other than simple associations.

Technological marvels provide the false illusion that humans have mastery over the laws of nature. This false illusion leads to scientific stagnation; because, there is no reason to do any further research, or to question existing theory.

Even when shown with anomalies of the accepted theories, humans can't accept that the anomalies are true because the existence of the technological marvels supposedly prove that the theories must be correct. But the human aspiration to achieve total stupidity does not stop there. The next, most scientifically devastating human behavior, shuts down any further discussion by essentially shrugging the problem with the following marvel or logic: "The anomaly cannot possibly be true; otherwise, someone would have said something by now. " This is known as The Smarter Monkey Fallacy which is the 27th Rule of Acquisition.

Between the Utility Fallacy and the Smarter Monkey Fallacy, it is virtually impossible to uproot old theories such as Maxwell's Equations in spite of all the anomalies and paradoxes that can be demonstrated.

3.0 Monkey do, does not mean monkey know.
3.1 Technology only requires the ability to mimic; it does not prove understanding.
3.2 The greatest obstacle to scientific progress is the illusion that we think we know what we are doing.

10: The Synthesis Rules

Everything is synthesized from more fundamental components. Don't expect the synthesized to share any properties with its components. For example, salt (white crystalline substance) is synthesized from chlorine (yellow gas) and sodium (gray metal). Salt is a necessary component of life while sodium and chlorine are toxic to life. Because the more fundamental components may bear no similarity to that which they synthesize, trying to extrapolate or derive the fundamental components from the derived is problematic. There are methods to determine the components of something. One method is to decompose the item into its components (if one knows how). Another method is to guess at the underlying components and derive from the components to the synthesized higher-level construct.

10.0 Every construct is synthesized from more fundamental constructs (components).
10.1 Do not expect a synthesis to share any properties with it components (related to Doppelganger Rule)
10.2 Because of 10.1, trying to derive down or extrapolate components is problematic
10.3 Separation of components or guessing and deriving up are the only options.
10.4 More fundamental constructs must be simpler and less ambiguous
10.5 An Intrinsic Property is a place holder for lack of knowledge of lower level constructs
10.6 An intrinsic property

11: The Doppelganger Rule (for Fundamental Natural Constructs)

In the Rules of Acquisition, doppelgangers are constructs that can be synthesized by different combinations of components (recipes). The key characteristic of doppelgangers is that they are comprised of different arranges of subcomponents but completely indistinguishable from each other.

An example of a doppelganger is $4=(-2)^2$ and $4=(+2)^2$. The results (4 and 4) are doppelgangers because there is no inverse operation that can non-ambiguously discern the original root from either result. This shows that the Doppelganger Rule is closely related to the Ambiguity Tell [ROA17]. The Ambiguity Tell forbids ambiguity at the fundamental level of nature and requires ambiguities at higher levels to be investigated because ambiguities, in some cases, result from missing information. In the example given in this paragraph, the result does not retain enough information for an inverse operation (square root) to discern the original root.

Because Doppelgangers exist in artificial/abstract constructs such as mathematics; the following rules apply only to natural constructs at the most fundamental level. The following discussion of the Doppelganger Rule is optimized for improving forward progress in understanding fundamental natural constructs.

The Doppelganger Rule for Fundamental Natural Constructs

If an isotope of gold can only be formed by a certain quantity and arrangement of protons, electrons and neutrons, then it follows that there can only be one unique arrangement (recipe) of subcomponents that comprise protons, electrons and neutrons. If different recipes of protons existed then it follows that there would be discernible differences among protons as well as discernible differences of the higher order constructs that comprise them. This would mean that there would be discernible differences among different atoms of the same isotope of gold and this has never been observed. If it were possible to have different recipes ("Isotopes") of protons, electrons, and neutrons that were indiscernible from one another, then it would be impossible to make scientific progress because it would be impossible to identify the

various "Isotopes" and any discussion of subcomponents is meaningless. This concept is highlighted using a math analogy where the number 4 is the item being observed. The number 4 can be synthesized by virtually infinite number of numerical expressions (recipes) (2+2, 2*2, 8/2, 1+3…). Since the result from each of the recipes is indiscernible from one another, any discussion about where 4 came from is meaningless.

The above discusses doppelgangers that result in the same output at the same level of synthesis. This type of doppelganger is called a horizontal doppelganger. The next paragraph discusses vertical doppelgangers where a construct is synthesized by both the recipe and the components of the recipe.

A vertical doppelganger exists when an effect synthesized from a recipe is also intrinsic to the components of the recipe. The term intrinsic is used as a placeholder for effects that are synthesized at a lower level that models don't yet exist for (an abstraction).

An example of a vertical doppelganger is mass (as used in the classical physics sense). Electrons have mass and charge which are treated as intrinsic properties; however, if two electrons are placed at a certain distance from each other, it is possible to compute an inductive coupling that results in an effect with the same units as mass. So is mass an intrinsic property or a synthetic property? It can't be both; otherwise, that would be an ambiguity and a violation of the 17th Rule. If it can be synthesized, then the intrinsic mass of an electron must also be synthesized from more fundamental components that have charge but no mass. This was the reasoning used over 20 years ago to postulate the existence of massless charged particles. Today, these particles are called Pretons which are more appropriately described as inertialess charged particles. It was necessary to disambiguate inertia from mass.

Another vertical doppelganger was resolved recently. The charge on a Preton was assumed to be a Coulomb charge which means that Pretons emit a Coulomb (electric) field. In the Foundation Video Series [FOUND], two derivations are presented which demonstrate an effect that looks just like the electric field synthesized from magnetism. The effects of Coulomb charge cannot be both intrinsic and synthesized. This paper reveals that both the magnetic field and the Coulomb field are synthesized from a more fundamental field called the Pretonic field. Furthermore, because both Magnetic and Electric field are synthetic, then neither Coulomb charges nor Magnetic monopoles exist. The charge on a Preton is now called a Pretonic charge and it is one of the only two remaining intrinsic properties of matter. The other is the shape of a Preton.

11.0 A synthesis cannot result from two different recipes (Horizontal Doppelganger)
11.1 A synthesis cannot occur at two different levels of construct (Vertical Doppelganger)
11.2 A synthesized property of mater cannot also be intrinsic (restatement of 11.1).

If it is synthesizable, in any amount, it cannot be intrinsic in any amount; otherwise, this would be an ambiguity and in violation of the 17th ROA.

34: The Intrinsity Tell

The intrinsity tell is a byproduct of the Synthesis Rules [ROA10] and the Doppelganger Rules [ROA11]. Though it is completely described by the above two discussions, it is assigned a separate number because of importance.

34.0 An intrinsic property indicates unfinished science
34.1 Intrinsic properties are abstractions (place holders) for synthesis at lower levels that are not presently understood.

13: The Perpetuity Tell

See section 2.5

15: The Correlation Obscuration Trap

The correlation obscuration trap is discussed in the Constructs Paper [EM02].

17: The Ambiguity Tell

Ambiguity in a construct (model, theory) indicates one of two possibilities. First, the construct is wrong (regardless of obtaining correct answers). Second, the construct is not the most fundamental representation of the Natural phenomenon. Either way, there is work to be done because Nature, at the most fundamental level, is not ambiguous.

This ROA include mathematics, and other such tools, used to implement models. Since mathematics is helpful in exploring the properties and behaviors of natural system, it would not be productive for tools to introduce ambiguities that are not present in the natural phenomenon.

The 17th Rule of Acquisition is one of the most powerful Tells. It is responsible for identifying most of the important leads that resulted in major advancements in Ethereal Mechanics. It is also a parent ROA that became the basis for many spin-offs such as the 24th Rule of Acquisition, The Arbitrary Tell which is listed next.

17.0 Ambiguity indicates that a more fundamental model or theory exists.

There are many sub-rules which highlight variations on ambiguity such as non-locality, non-causality, non-invertibity, etc. which became spin off ROA.

See [ROA17] for more details.

24: The Arbitrary Tell (formerly Arbitrary Constant of Relation Tell)

If you know how it works, then nothing should be arbitrary. It is ironic that Physicists call their models "Laws" when they contain arbitrary constants of relation (ACOR). Take for example Newton's "Law" of Gravity which contains the arbitrary constant of relation G. It is just an empirically derived value that related the left side of the equation to the right side. This is the same constant found in the General Relativity (GR) model of gravity which means that GR is just a more elaborate empirical model, not a "law" of nature.

A proper "theory of everything" must be free of arbitrary constants of relation (ACOR). Examples of ACORs include the gravity constant G, the electromagnetic constants ϵ and μ and others. ACORs are artifacts of the regression of experimental data. If science does not explain how these constants arise from fundamental constructs, then it's not science, just monkey business as usual. Monkey do, does not mean monkey know.

24.0 If you know how it works, then nothing should be arbitrary
24.1 Arbitrary Constants of Relation are forbidden from a Theory of Everything

The constants listed above are derived from fundamental constructs later in this paper. Because the origins of the constants are now understood, they are no longer arbitrary.

2.2 Transvariance

[The Transvariance Paper is available as www.distinti.com/em.html]

The first Ethereal Mechanics paper "Ethereal Mechanics: Transvariance" [EM01] utilizes a high-fidelity simulation of the Michelson Morley experiment (MME) to explore the compensations needed to obtain a null result for the MME. The effort found that Time Dilation and Length Contraction were insufficient to completely compensate the MME and that other translational variations (Transvariations) are required to obtain the proper null result. These include Transvariant Reflection, Transvariant Emission as well as others that are released in subsequent papers (such as this). An important realization from the effort is that

Transvariations are manifestation of normal Newtonian mechanics/Electromagnetism and not some spooky action that occurs for no reason at all except that it is required to obtain the correct answers. Transvariance supersedes Einstein's Special Relativity.

2.2.1 Force Transvariance (Speed of Force)

This section explores the variation in applied force while a system is in translation. This Transvariation was not in the Transvariance paper. The discussion begins with Newton's Force model

$$\mathbf{F} = M\mathbf{a}$$

Solve for Acceleration

$$\mathbf{a} = \frac{\mathbf{F}}{M}$$

As the mass approaches zero, it would seem that the acceleration approaches infinity. This would be a violation of the Fantasticism Tell [ROA09]. There must be some limiting factor to an applied force that would prevent such a condition. A person well versed in mainstream scientific thinking would say that as the mass accelerates, its velocity increases, this in turn causes the mass to increase to the point where the velocity could never exceed the speed of light. The change in mass is given by the following relationship

$$M' = \frac{M}{\sqrt{1-\frac{V^2}{C^2}}}$$

The above is taken cautiously until a Transvariant mechanism is demonstrated that explains how matter can pop into existence inside existing matter while in translation. Instead of matter popping into and out of existence, consider that it is the ability of matter to couple to the force is changing as a function of velocity. This is more consistent with other Transvariant phenomena.

The following examples support the idea that forces have a speed limit on the velocity of their forcing function.

Consider a 1 meter high ocean wave that is designated as 1M for brevity. The 1M wave impacting a super tanker will not disturb it in any significant manner. A surfer, which has much less inertia than the super tanker, can ride the 1M wave for a considerable distance. A shoreline affected by the wave will experience an imperceptible amount of erosion.

Next, consider a 30 meter high ocean wave (30M). The 30M wave can disturb the supertanker in a significant manner. The surfer will just ride the wave until it breaks. A shoreline will experience significant erosion, damage and loss of life to a few kilometers inland.

Finally, consider a 1000 meter high ocean wave (1000M). Both the surfer and the super tanker can surf the wave until it breaks. Islands would be wiped clean of all flora and fauna and the shapes of all impacted land masses would be altered significantly.

In the examples above, each successive wave contained significantly more destructive force and yet the outcome of the surfer was essentially the same. The surfer could go no faster than the wave regardless of how much destructive force was contained in the wave. The key is that the inertia of the surfer was so insignificant that the surfer could accelerate to the velocity of the wave before a significant part of the wave arrived.

This limitation of the speed of the forcing function is seen throughout engineering. Other examples include the limitation of rifle projectile velocity due to the speed at which combustion pressure waves can travel down a long barrel. Another example is the limitation of steam locomotive speed because of the limited speed at which steam can be forced into a cylinder. Finally consider that a water wheel can't turn faster than the speed at which water can fall.

In all of these cases, the ability to accelerate diminishes with velocity; when the item being forced attains the velocity of the forcing function, acceleration ceases. This behavior could be falsely interpreted as an increase of inertia to the point of infinite mass.

Since all forces are conveyed by electromagnetic interactions, and because electromagnetic interactions cannot travel faster than the speed of light, then the ability to apply any force diminishes with velocity.

2.3 Constructs

[The Constructs paper is available at www.distinti.com/em.html]

The second Ethereal Mechanics paper is "Ethereal Mechanics: Constructs" [EM02] which develops a more modern foundation upon which to build Ethereal Mechanics. The Constructs paper introduces the 15th and 24th Rules of Acquisition which are highlighted in the previous section; along with, the development of natural units which is highlighted in the following subchapter.

2.3.1 Natural Units versus Legacy Units

Ethereal Mechanics uses Natural units which are all derivatives of charge, time, and length. Natural units are converted to Legacy units with the constant Km. The following example demonstrates how the Natural Newton (Square Amperes) is converted to the legacy Newton through multiplication by Km.

$$F = \frac{Q^2}{S^2}$$ The Natural Newton (Square Amperes)

$$K_M = \frac{\mu_0}{4\pi} \quad \frac{Kg\,m}{Q^2}$$

$$F = K_M F \quad \frac{Kg\,m}{S^2}$$ The Legacy Newton

For clarity, legacy units and related constructs are represented in blue text while natural units are normal text color (black in this case).

In section 5.1.3 mass is disambiguated from inertia. Mass is represented with capitol blue M and inertia is represented with capitol B. This causes the following variants on Newton's Force relationship.

$\mathbf{F} = B\mathbf{a}$ The Natural Newton

$\mathbf{F} = M\mathbf{a}$ The Legacy Newton

In some expressions found in this paper, a product, or quotient, of two legacy constructs cancels the legacy components resulting in a natural quantity. In the following example, legacy force is divided by mass (which only comes in legacy form) to arrive at acceleration which is a natural quantity.

$$\mathbf{a} = \frac{\mathbf{F}}{M}$$

The Constructs paper contains a more complete list of natural units.

2.4 Vortrix Algebra

[The Vortrix Algebra Paper is available at www.Distinti.com/va.html]

A number of years ago, it was realized that standard vector algebra is insufficient for modeling fields because it lacks a divide operator. More important, vector products provide incomplete results that are insufficient to provide for the inverse operation of division. This incomplete result interferes with the ability to properly model nature. This problem is illustrated in the following example. Consider two vectors **A** and **B** and their product **AB,** as shown in the following example of 2 dimensional (2D) vector algebra.

$$\mathbf{A} = Ax + Ay$$
$$\mathbf{B} = Bx + By$$
$$\mathbf{AB} = AxBx + AyBy + AxBy + AyBx$$

The product above is represented below in Legacy Vector Algebra (LVA) format which separates the product into the Legacy Dot and Cross products. The Legacy Cross product, by convention, inverts the sign of one term.

$$\mathbf{A} \bullet \mathbf{B} = AxBx + AyBy$$
$$\mathbf{A} \times \mathbf{B} = \left(AxBy - AyBx \right)\mathbf{n}$$

An important observation of the legacy products is that all of the results fall out of the original dimensions. The legacy Dot product is, by definition, scalar which is neither in the x nor the y dimension. Furthermore, the Legacy Cross Product is, by definition, normal to the original products which means it is vector in some dimension that does not contain x or y. So all of the information (or energy) vanishes from the dimensions that describe the system (it falls out of space). How can one model conservative physical systems when the tools allow information or energy to vanish? Also, it is somewhat paradoxical to consider a third dimension when the defined vector space is only 2 dimensional. Therefore, the energy (or information) is lost to other constructs/dimensions that are not related to the original space of the vectors.

Furthermore, the legacy cross product becomes ambiguous when considering vector spaces beyond 3 dimensions because the number of orthogonal dimensions to any two are greater than 1 (N-2>1). This is illustrated by considering a vector space of 4 dimensions X, Y, Z and P. The cross product of a vector parallel to the X axis with a vector parallel to the Y axis must result in a vector normal to X and Y. With 4 dimensions, there are now two dimensions (P and Z) that are normal to X and Y (4-2=2). So where does the cross product result go?

A more critical problem is the loss of information in the result that prevents the ability to provide for a non-ambiguous divide. The ambiguity itself is a violation of the 17th Rule of Acquisition; furthermore, it is an outrage to model conservative field phenomena, or conservation of energy phenomena, with modeling tools that lose information.

The 17th Rule of Acquisition [ROA17] is known as the Ambiguity Tell. According to the rule, an ambiguity in a model, tool or theory indicates that it is not the most fundamental form of the construct. It is either wrong, incomplete or a special case of something more fundamental because nature does not have ambiguities at its most fundamental level.

It is these deficiencies that prompted the development of a more complete vector algebra that does not loose energy and provides a complete multiply that can be inverted with divide. That new Algebra is called Vortrix Algebra which is a contraction of Vortex Matrix Algebra.

The breakthrough which yields the missing product components is realized when considering a triple product.

$$\mathbf{A} = Ax + Ay$$
$$\mathbf{B} = Bx + By$$
$$\mathbf{C} = Cx + Cy$$
$$(\mathbf{AB})\mathbf{C} = AxBxCx + AyByCx + AxByCx + AyBxCx + AxBxCy + AyByCy + AxByCy + AyBxCy$$

Then by carefully reconciling the terms results in a matrix.

$$[\mathbf{AB}]\mathbf{C} = \begin{bmatrix} AxBx + AyBy & -AxBy + AyBx \\ AxBy - AyBx & AxBx + AyBy \end{bmatrix} \begin{bmatrix} Cx \\ Cy \end{bmatrix}$$

Writing the Vortrix Product in terms of legacy products results in

$$[\mathbf{AB}] = \begin{bmatrix} \mathbf{A} \bullet \mathbf{B} & -\dfrac{\mathbf{A} \times \mathbf{B}}{\mathbf{n}} \\ \dfrac{\mathbf{A} \times \mathbf{B}}{\mathbf{n}} & \mathbf{A} \bullet \mathbf{B} \end{bmatrix}$$

Note1: The Cross Products are divided by the normal (**n**) to reduce the result to the signed scalar magnitude
Note2: The above is only valid for 2D products

The important aspects of Vortrix Algebra are

1) Even number of products result in a matrix; odd result in a vector
2) There is enough information in the matrix (8 terms as opposed to 4) to effect non-ambiguous division
3) The product results in a matrix that is defined in terms of the original dimensions (no more out of space loss of information/energy)

This section gives a brief overview of Vortrix Algebra using a very simple 2 dimensional (2D) example. An engineer should have no problem understanding the glaring hole in LVA that has been holding science back. This example should also be within reach of undergrads; as well as, high school AP students. It is not expected that Physicists or Cosmologists will make it past the word Ether in the abstract. To any who have made it this far, welcome aboard!

The remainder of this paper uses Vortrix Algebra for 3 Dimensional Space (3D) which is an order of magnitude more complex than 2D; instead of a product resulting in a matrix containing 8 terms, a 3 dimensional Vortrix product results in a matrix containing 64 terms.

Because VA is new to just about everyone, most (if not all) derivations in this paper will be done step-by-step. This paper will serve as application examples of VA because the VA paper has too few examples.

2.4.1 Vortrix Identities used in this paper

$[\mathbf{A}/\mathbf{B}] = \frac{\mathbf{BA}}{\mathbf{B}^2} = \frac{\hat{\mathbf{B}}\mathbf{A}}{B}$ Right Divide is replaced with Left Multiply

$[\mathbf{B} \setminus \mathbf{A}] = \frac{\mathbf{AB}}{\mathbf{B}^2} = \frac{\mathbf{A}\hat{\mathbf{B}}}{B}$ Left Divide is replaced with Right Multiply

$[\mathbf{A}/\mathbf{B}]\mathbf{B} = \mathbf{A}$ Right Divide cancled by Right Multiply

$[\mathbf{A}/\mathbf{B}]\mathbf{A} = \frac{[\hat{\mathbf{B}}\mathbf{A}]\mathbf{A}}{B} = A^2$ (direction is B reflected about A)

$[\mathbf{AB}]\mathbf{A} = A^2\mathbf{B}$

$[\mathbf{AB}]\mathbf{B} = AB^2$ (direction is A reflected about B)

2.5 The Perpetuity Tell

From Newton's First Law to Conservation of Energy, legacy science is a bastion of perpetuity. Physicists will belittle and mock the ardent inventor, striving to develop a perpetual motion machine; whilst ignoring their own transgressions. These ignored transgressions represents "Tells" that indicate incomplete physics and opportunities for Ethereal Mechanics.

Ethereal Mechanics follows the Scientific Rules of Acquisition [ROA] which do not permit such transgression. Each paper in the Ethereal Mechanics series of papers addresses the transgressions pertinent to the context of the paper.

The Perpetuity Tell is formerly introduced next, followed by an application in section 2.5.1

Rule of Acquisition 13: The Perpetuity Tell [ROA13]

The 13th Rule of Acquisition: The Perpetuity Tell
13.0: Nothing is forever
13.1: No Perpetual Existence (*)
13.2: No Perpetual Motion (*)
13.3: No Perpetual Propagation (*)
13.4: No Perfect Conservation (*)
13.5: No Exchange of energy is 100% efficient (*)
13.6: No over unity (by inference)

* For small scale modeling, over which losses are negligible, perpetuity and 100% efficiency are allowed as approximations. For example, engineers model AC power transformers as 100% efficient (power out = power in) because it makes the analysis simpler. Power transformers are typically 97% to 99% efficient. The 1 to 3 percent error is negligible to the needs of most applications and is within the scale of part manufacturing tolerances which are typically 5%. In most applications, engineers ignore the tolerances because, in these applications, a design that agrees 90% (or better) with the engineering analysis is quite acceptable and cost effective.

Note: small scale modeling includes short time scales (short duration).

2.5.1 Existence is not Perpetual, Matter Must Feed To Exist

[EMV021 https://youtu.be/NTpytbccqgs]

According to the gospel of mainstream science, a blob of stable matter will exist, in perpetuity, if left undisturbed. Someone may argue that particles decay and it's not really a situation of perpetuity. But they can't explain what causes matter to decay nor can they explain what causes matter to remain stable before decaying for no reason. Even when matter decays, the energy that was once that matter remains in existence forever (Conservation of Energy). So it really is a situation of perpetuity. This chapter provides an alternative understanding of existence.

Consider a small drone hovering 1 meter above the ground. That drone will consume fuel at a certain rate to maintain its altitude which could be represented in terms of its potential energy state given by mgh. Attach a 1Kg mass to the drone, now the drone must expend fuel at a higher rate to maintain its energy state plus that of the additional mass.

Now consider a 1 meter long post standing vertically on the ground. Because of Newton's First Law that post must remain there to perpetuity unless some external force disturbs it. Let's further suppose that the post is made of a material that will not corrode in a significant manner or suffer any other affliction that would interfere with its ability to remain upright during the period of this experiment.

Now place the 1Kg mass on top of the post. The post now has to support the additional load of the mass. If the drone had to increase energy consumption to maintain the additional load, then so too must the post; otherwise, conservation of energy is nonsense.

Now consider the post without the mass. The bottom half of the post must support the top half of the post. Therefore, the bottom half must consume more fuel than it would if the top half were not there. Taking this argument to its logical conclusion requires that matter must feed on some sort of fuel to maintain a stable existence.

Taking the argument from a different perspective; consider that the drone had to consume fuel at a constant rate to maintain the stable energy state of the system. This means that fuel must be consumed to maintain a stable state of Energy. Thus, the stable existence of both Matter and Energy requires a constant consumption of fuel. This duality is consistent with Einstein's mass energy equivalence ($E=MC^2$) which is believed to suggest that matter and energy are interchangeable. If they are interchangeable, then both must feed in order to remain stable.

At this point, some may have a problem with the notion that energy requires fuel consumption to exist. That "energy consumes energy" seems like a circular definition; however, the next section demonstrates that our definition of energy is not fundamental; it is merely a "gauge" that represents energy using the relative state between two blobs of matter. This is directly analogous to an automobile gas gauge which represents the energy content of the gas tank as the state (angular deflection) of a needle. This gauge represents energy (it is not energy itself) and the gauge itself must consume energy to operate properly. Nothing is for free.

Because our definition of energy is only a representation of a more primordial construct, it is subject to ambiguities and circular definition. This is demonstrated in the next section (3.1).

3 New Energy Paradigm

The New Energy Paradigm (NEP) introduces a new relationship between Energy, Power, Force, Matter and Ether. The legacy definition of energy is obscured by mass which gives the false impression that energy and matter are interchangeable. This interchangeability is demonstrated to be a fallacy since Energy(joules), Inertia (mass), Momentum and every other property of matter are just states of a Pretonic system. Though the states are interchangeable the quantity of actual particles remains the same.

The most important point is that the joule is not the fundamental definition of energy. It correlates to energy in much the same way the gas gauge on a car correlates to the energy content of the fuel tank. Just as the deflection of the gas gauge needle is a state that represents the energy in the tank the joule is a state of a Pretonic system represents actual energy.

It was original intended that the New Energy Paradigm (NEP) be included in Electrogravity (EG) as a whole; however, recent developments have expanded the scope of NEP. In order to prevent delay of the Electrogravity release as the new material is being developed, Electrogravity includes just enough of the NEP that is relevant to EG.

3.1 The Energy Conundrum

[This topic was first released to Patreon Passenger and above in 2017. Search on Patreon for NEP]

The previous section argued that the legacy definition of energy is only a gauge representation of energy. This gauge represents energy as a state between two blobs of matter; however, because of Einstein's Energy relationship ($E=MC^2$), matter is essentially energy in a different form. This represents a circular, or recursive, definition because if matter is energy and energy is represented as a state between two blobs of matter then matter can be represented as a state between two blobs of matter. And the ambiguous circular definition rears its ugly head. This argument is demonstrated again mathematically.

This first objective is to show the two body "gauge" representation of energy. There are two types of energy, kinetic and potential. Beginning with kinetic energy which is defined as

1) $$E = \frac{1}{2} M V^2$$

The V stands for velocity, a relative quantity, which means the definition of energy is also a relative quantity; rendering it ambiguous. The ambiguity is demonstrated by consider an asteroid of mass M speeding through space at some velocity V. If everything in the universe were moving at that same velocity, then every observer would observe the asteroid as motionless and therefore devoid of kinetic energy. If all the objects were moving at different velocities, then all observers would asses a different kinetic energy of the asteroid which throws the concept of conservation of energy out the window. The only thing salvageable from this analogy is that if the asteroid collides with another object; all observers see the same CHANGE IN ENERGY which is called work. Work is conserved and Energy is ambiguous. This is strange because Work and Energy share the same units; so why are both not conserved. This is part of the ambiguity, of the definition of energy, that Ethereal Mechanics will resolve; but first, there are more case studies to consider.

Next consider Potential energy. A 1kg mass stationed 1 meter above the surface of the Earth has a potential energy given by

2) $E = Mgh$

Without the Earth, g=0, and there is no energy. Once again, the definition of energy is a gauge representation of the state that exists between two blobs of matter.

Finally, consider is the definition of energy itself

3) $E = M \int_{S=0 \text{ to } d} \mathbf{a} \bullet d\mathbf{S} + E(0)$

The definition of energy seems to be insulated from the two body gauge; however, this is an illusion because the source of the acceleration is abstracted. This is illustrated by condsidering a completely empty universe that contains a single 1kg mass located at the origin with no initial Energy (E(0)=0). Energy could be added to the mass by accelerating it; however, that would require a second body. For the sake of argument, ignore the second body. Under constant acceleration, over a finite distance, the total energy in the universe would be.

4) $E = Mad$

The gauge problem seems to be resolved because acceleration is not a relative term and distance is from where the mass was and not relative to other masses. But there is still an ambiguity because Einstein's energy equivalence model expressly states that matter and energy are interchangeable.

5) $E = MC^2$

The ambiguity is demonstrated by observing that in step 4, energy is defined in terms of matter; while in step 5, they are supposedly interchangeable. If they are interchangeable, then we should be able to solve step 5 for mass and substitute that into step 4 to yield.

$$E = \frac{E}{C^2} ad$$

$$C = \sqrt{ad}$$

The result is ambiguous. It contains neither mass nor energy.

What scientists have been conserving these past few centuries is work (change in energy); not energy itself.

In this paper, the concepts of work, energy and power are reengineered to eliminate the dependency of the definitions on matter. The important reason for this is hinted to in section 2.5.1. If matter exists by consuming a form of fuel which is ostensibly a source of energy, then energy cannot be defined in terms of matter.

The Constructs paper [EM02] outlines the mass free definition of "energy" which is found by dividing legacy Joules by K_M which arrives at

$$\frac{E}{K_M} => \frac{Q^2 m}{S^2}$$ Natural Joules (square amper meters)

This topic is continued after more concepts are introduced and other transgressions resolved.

3.2 The Fuel-Force Paradigm

From the drone analogy in section 2.5.1, it was argued that fuel is burned at a constant rate to counter the force of gravity to maintain the energy state of the 1Kg mass. There then exists a function that correlates the rate of fuel consumption to a force. Using v to represent volume of fuel in cubic meters the expression is

$$F = f\left(\frac{dv}{dT}\right)$$ "f" represents some function

Since Energy remains constant as long as force remains constant, then

$$E = f(F)$$

Writing the dependencies a different way

$$E \Leftarrow F \Leftarrow \frac{dv}{dT} \text{ where } \Leftarrow \text{ represents } f(\text{everything to the right})$$

Observing the above represented in natural units

$$\frac{Q^2 m}{S^2} \Leftarrow \frac{Q^2}{S^2} \Leftarrow \frac{m^3}{S}$$

In the above expression Q is Pretonic charge which is introduced in section 4. In section 5.1.12 the constant K_P is derived that shows a fundamental relationship between charge and distance. Replacing charge with meters results in.

$$\frac{m^3}{S^2} \Leftarrow \frac{m^2}{S^2} \Leftarrow \frac{m^3}{S}$$

Ignoring the force term (the middle) it is clear to see that maintaining a constant energy state requires the time derivative of fuel consumption

$$E \propto \frac{d^2 v}{dT^2}$$

Furthermore, without the force of gravity, there would be no need to expend fuel.

4 Pretonics

The Science of Pretonics is a set of field and particle models that are the precursor to matter and consequently existence. The behavior of all larger scale constructs, which include matter and all known fields to Galaxies and beyond, can be derived from the Pretonic models. In the present iteration of Ethereal Mechanics, the Pretonic models are still primitive and are represented as mathematical abstractions which are sufficient to derive the items mentioned. As the refinement process (see section 1.2) progresses, the abstractions are replaced with more coherent constructs.

4.1 Pretons

Pretons are the precursors to all known matter. Pretons are modeled as inertialess charged particles. Pretonic charge is the source of all known fields. All fields are synthesized by Pretons in motion relative to the Ether (medium). If Pretons stop moving relative to the medium, then ALL field emissions from matter vanish (including gravity). Although the emissions cease, it still takes time for the cession of field activity to propagate outward. There is no such thing as a static field.

The only misnomer to the above paragraph is gravity. Gravity is the consumption (a sink) of Ether by a Preton in motion; therefore, a gravitation field is an inward flow. Although gravity is an inward flow, the term "radial emission" still applies; because, as a Preton moves, the sink point moves and the change of the flow pattern propagates outward in a radial fashion. This is directly analogous to a drain in a bathtub. Although the water is flowing toward the drain, if the drain were moved, the change in flow pattern would propagate outward giving the illusion that it is an emission.

Fields propagate in a radial fashion from the point where the Pretonic motion occurred (the point of origin) and propagate relative to the medium. An analogy would be the manner in which a ship moves through water causing a wake. This concept of the field following the medium and not the source is a departure from legacy physics where Einstein, in order to resolve an "issue" between electromagnetism and Relativity, proclaimed that a magnetic field must follow the magnet (the source). In the video [Reference goes here] it is shown that Einstein's proclamation violates locality.

From classical electrodynamics, the Coulomb field (Electric field) about a stationary charged object appears to be a stationary never changing field. A stationary never changing field is called a static field. Another example of a static field is the magnetic field generated by a stationary permanent magnet. Static fields are an illusion. An example that highlights this illusion is the stationary never changing light cone of a street light. It looks like a static phenomenon; however, it is well known that the light propagates from the light bulb. In Ethereal mechanics, fields are emission from a point of origin; therefore, there is no such thing as a static field.

Electric (Coulomb) fields are generated by Pretons in motion. It is not a static field, it is an emission. Because, actual Coulomb charges do not exist, the electrical quantity known as the Coulomb is repurposed in such a way to maintain compatibility with electrical engineering practices and measurement equipment.

Magnetic fields are also generated by Pretons in motion. The motion, in this case, is simple translation. Because Electrons are comprised of Pretons, Electrons also produce a magnetic field via simple translation. Since electric current directly correlates to Pretonic current, then this is the logical place to correlate Pretonic charge to the Coulomb.

The present model synthesizes an Electron from 2 Negative Pretons. To maintain compatibility with instruments that measure current, Negative Pretons are said to have ½ the unit charge of the Electron. This relationship keeps electric current and Pretonic current the same in terms of Coulombs per second. If the Pretonic model changes, this relationship will be upheld in order to maintain compatibility and minimize disruption.

As of this iteration of Ethereal Mechanics, the properties of positive Pretons are more nebulous. As stated in section 1.2.1, abstractions are employed as substitutes where needed and will be replaced when better models are developed (which is how science actually works).

It is presently believed that the relationship between Negative and Positive Pretons is asymmetric. Where negative Pretons have an even fraction of a unit charge (1/2) while positive Pretons have an odd fraction of a unit charge (1/3 or 1/6 or ….). This asymmetry is one way to assure that all stable atoms have positive nuclei.

Another possibility is that Pretons are constructs of something more primitive and that Pretonic charge may vary from Preton to Preton. For example, positive Pretons may come in any of the following charges 1/3, 1/6, 1/9… while negative Pretons come in 1/2, 1/4, 1/8 etc. It is thought that if this were the case, there would be more variety of stable particles than just the Electron, Proton and Neutron. Also, nature seems to become less complex the further down the rabbit hole; therefore, one denomination of charge, per Preton polarity, is the logical consensus (presently).

4.2 Pretonic Field (Ampere Matrix Field)

A Pretonic field is a disturbance created by a Preton moving through the medium. The disturbance propagates radially from the point of origin through the medium at the speed of light relative to the medium.

For the purpose of illustration, the subscript S is used to mark the mathematical symbols related to the source of a field or disturbance; while the subscript T represents the Target that is reacting to the field or disturbance.

The mathematical abstraction for the Pretonic field is given by the following Vortrix Equation.

$\mathbf{D} = -Q_S \left[\mathbf{V}_S / \mathbf{r} \right]$ The Ampere Matrix Field

Where

$\mathbf{D}$ =The matrix disturbance at some target location (T).

Q_S =The quantity of the source (S) Pretonic charge in Coulombs.

$\mathbf{V}_S$ =The vector velocity of the source Preton relative to the medium.

$\mathbf{r} = \mathbf{P}_T - \mathbf{P}_S$ = the vector distance from the source location (position) to the target location.

$\hat{\mathbf{r}}$ = The unit direction vector of $\mathbf{r}$ (used later)

The units of the above are amperes represented as a Vortrix Matrix. This representation of the Pretonic field is called the Ampere Matrix Field. The reason for this distinction is that more fundamental models of the Pretonic field will be released in the future. These improved models have different representations that permit applications that transcend the simple topics represented in this paper.

It should be apparent that the field is a negative representation of the behavior of the Preton. It is somewhat representative of Newtons Third Law.

A graphic representation of the Pretonic field is somewhat difficult because of its nature as a matrix; however, a crude representation is shown in Figure 4-1. The blue circle represents a Preton of charge Q translating through the medium to the right at velocity V. The dashed circles represent the outward propagation of the disturbance from past points of origin. The origin points of the circles are equally spaced to show how the field builds out over time. The red arrows represent the “polarization” of the potential work that the field can inflict on a distant (or target) Preton.

Again, this is only an abstract representation of the Pretonic field. It is sufficient for the purposes of this paper. The paper titled Ethonics releases a more comprehensive model for the Pretonic field in terms of the structure of the medium.

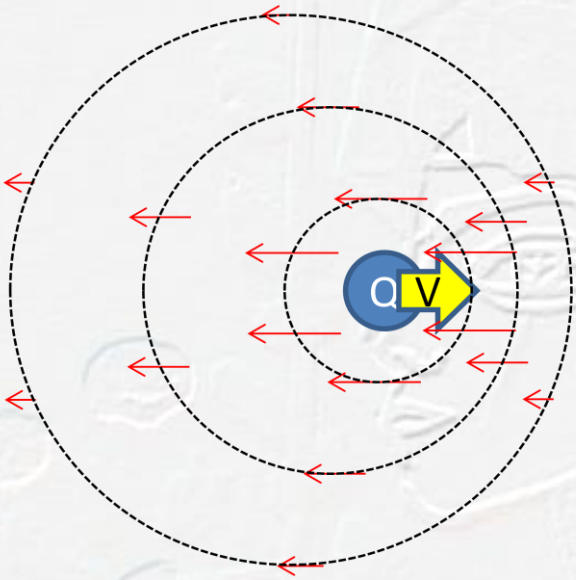


Figure 4-1: Pretonic Field Graphic Representation

4.2.1 Transvariant Emission

Figure 4-1shows the dashed lines concentrating in front of the moving charge. This could be interpreted to suggest that the field intensity is asymmetrical about the moving Preton. This intensity is compensated by Transvariant Emission (See [EM01]) which allows the use of a simple isotropic field model.

4.2.2 Preton Speed

If a Preton exceeds the speed of light relative to the medium, it will couple to its own field emission causing itself to decelerate (see Pretonic Force in Next Chapter). Therefore, a Preton cannot exceed the speed of light relative to the medium.

Because Pretonic Radiation cannot propagate faster than the speed of light, then according to the Speed of Force Transvariance in section 2.2.1, the Pretons will always be riding the force like a surfer and their speed is always the speed of light. No more, no less.

4.3 Pretonic Force

The potential work contained in the outward radiating Pretonic field couples to other Pretons (Targets) as a function of the time derivative of the Pretonic field. The derivation of the Pretonic Force equations begins by considering two Pretons as shown in Figure 4-2.

The Variables $\mathbf{P_S}$ and $\mathbf{P_T}$ represented the vector positions of the Pretons. The values Q_S and Q_T represent the scalar quantity of Pretonic charge present on each Preton. The symbol ‘r’ is the vector distance from source to target where $\mathbf{r= P_T-P_S}$. Vectors and matrices are represented in bold face.

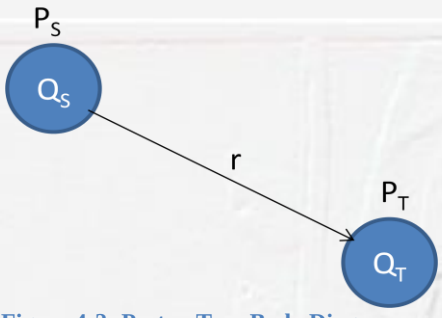


Figure 4-2: Preton Two-Body Diagram

The force on the target is given by the time derivative of the Pretonic field multiplied by the radial direction vector and the quantity of target charge. This is shown in the following expression

$$\mathbf{F}_T = \left[\frac{d}{dt}\mathbf{D}\right]\hat{\mathbf{r}}Q_T = -Q_S Q_T\left[\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right]\right]\hat{\mathbf{r}} \quad \text{(Force in Square Amperes)}$$

The derivation begins by first solving the derivative. Vortrix Algebra (VA) is new, so a standard table of derivatives does not yet exist; therefore, the derivative must be taken using limits. Because Vortrix Algebra provides a legitimate divide operator, this is now possible. This derivation is done step-by-step to help people become more familiar with Vortrix Algebra

1) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{(\mathbf{V}_S+\mathbf{a}_S\Delta t)/(\mathbf{r}+\dot{\mathbf{r}}\Delta t)-\mathbf{V}_S/\mathbf{r}}{\Delta t}\right]$$

Right Multiply Top and Bottom by $(\mathbf{r}+\dot{\mathbf{r}}\Delta t)$

2) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{(\mathbf{V}_S+\mathbf{a}_S\Delta t)-\left[\mathbf{V}_S/\mathbf{r}\right](\mathbf{r}+\dot{\mathbf{r}}\Delta t)}{\Delta t(\mathbf{r}+\dot{\mathbf{r}}\Delta t)}\right]$$

Multiply through

3) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{\mathbf{V}_S+\mathbf{a}_S\Delta t-\left[\mathbf{V}_S/\mathbf{r}\right]\mathbf{r}-\left[\mathbf{V}_S/\mathbf{r}\right]\dot{\mathbf{r}}\Delta t}{\mathbf{r}\Delta t+\dot{\mathbf{r}}\Delta t^2}\right]$$

Simplify (Right multiply "cancels" right divide)

4) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{\mathbf{V}_S+\mathbf{a}_S\Delta t-\mathbf{V}_S-\left[\mathbf{V}_S/\mathbf{r}\right]\dot{\mathbf{r}}\Delta t}{\mathbf{r}\Delta t+\dot{\mathbf{r}}\Delta t^2}\right]$$

Cancel V_S

5) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{\mathbf{a}_S\Delta t-\left[\mathbf{V}_S/\mathbf{r}\right]\dot{\mathbf{r}}\Delta t}{\mathbf{r}\Delta t+\dot{\mathbf{r}}\Delta t^2}\right]$$

Divide out delta T (Scalars are commutative in VA)

6) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \lim_{\Delta t\to 0}\left[\frac{\mathbf{a}_S-\left[\mathbf{V}_S/\mathbf{r}\right]\dot{\mathbf{r}}}{\mathbf{r}+\dot{\mathbf{r}}\Delta t}\right]$$

Take Limit

7) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right] = \frac{\mathbf{a}_S-\left[\mathbf{V}_S/\mathbf{r}\right]\dot{\mathbf{r}}}{\mathbf{r}}$$

Since $\mathbf{r}=(\mathbf{P}_T-\mathbf{P}_S)$ then $\dot{\mathbf{r}}=(\mathbf{V}_T-\mathbf{V}_S)$

8) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right]=\frac{\mathbf{a}_S-\left[\mathbf{V}_S/\mathbf{r}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{\mathbf{r}}$$

The $\mathbf{r}$ in the denominator was a right divide, it must be applied to the terms individually as a right divide

9) $$\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right]=\left[\mathbf{a}_S/\mathbf{r}\right]-\left[\mathbf{V}_S/\mathbf{r}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)/\mathbf{r}$$

Add back the other items from the force expression and multiply through. In VA, the order of multiply for vectors and matrices matters.

10) $$\mathbf{F}_T=Q_SQ_T\frac{d}{dt}\left[\mathbf{V}_S/\mathbf{r}\right]\hat{\mathbf{r}}=Q_SQ_T\left(\left[-\mathbf{a}_S/\mathbf{r}\right]\hat{\mathbf{r}}+\left[\left[\mathbf{V}_S/\mathbf{r}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)/\mathbf{r}\right]\hat{\mathbf{r}}\right)$$

Because the right divide of $\mathbf{r}$ and the right multiply of $\hat{\mathbf{r}}$ were done back to back, they can be combined forming a scalar which is shown as an ambiguous divide (Horizontal line)

11) $$\mathbf{F}_T=Q_SQ_T\left(-\frac{\mathbf{a}_S}{|\mathbf{r}|}+\frac{\left[\mathbf{V}_S/\mathbf{r}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{|\mathbf{r}|}\right)$$

Substitute $\mathbf{r}=|\mathbf{r}|\hat{\mathbf{r}}$

12) $$\mathbf{F}_T=Q_SQ_T\left(-\frac{\mathbf{a}_S}{|\mathbf{r}|}+\frac{\left[\mathbf{V}_S/\left(\hat{\mathbf{r}}|\mathbf{r}|\right)\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{|\mathbf{r}|}\right)$$

Because scalars can commute, commute the scalar $|\mathbf{r}|$ from the right divide to the scalar divide (below the horizontal line)

$$\mathbf{F}_T=Q_SQ_T\left(-\frac{\mathbf{a}_S}{|\mathbf{r}|}+\frac{\left[\mathbf{V}_S/\hat{\mathbf{r}}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{|\mathbf{r}|^2}\right)$$

Equation 4-1: Pretonic Force Model of New Electromagnetism V5

The above expression is separated into the following

$$\mathbf{F}_T=-Q_SQ_T\frac{\mathbf{a}_S}{|\mathbf{r}|}\ \text{(Square Amperes)}$$

Equation 4-2: Inertial Force Model A.K.A New Induction V5

The Inertial Force model is what started Ethereal Mechanics over 20 years ago. In Legacy units, it is known as "New Induction" and has been experimentally validated in the Distinti Graduate Thesis [DGT].

$$\mathbf{F}_T=Q_SQ_T\frac{\left[\mathbf{V}_S/\hat{\mathbf{r}}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{|\mathbf{r}|^2}\ \text{(Square Amperes)}$$

Equation 4-3: Magnetic Force Model A.K.A New Magnetism V5

The Magnetic force model is new; experimental validation is contained in the follow-on paper "New Electromagnetism V5" [EM04]. The Magnetic Force Model replaces terms 2, 3, and 4 of previous version of New Electromagnetism.

The natural units of force are Square Amperes. To convert Square Amperes to the SI units of force, multiply by K_M, see section 2.3 for more detail.

Important Note: the Values Q_S and Q_T represent the Total Pretonic charge, in Coulombs, of the constructs associated with the Velocities, Accelerations and Force (Target Acceleration). At the Pretonic Level, where Preton motions are considered, these values are the Preton charges which are fractional unit charges. At the electrical engineering level, these values are the Pretonic content of the charge carriers (Electrons, holes) which would be expressed in whole unit charges or in amperes. The paper New Electromagnetism V5 [EM04] demonstrates electrical engineering applications of the above.

In the remainder of this paper, these models are applied to a Pretonic model of matter to derive properties of matter to include inertia, gravity, Coulomb field, time dilation, etc.

For engineering applications of New Induction, see the paper New Induction Applications [NIA1] and the Distinti Graduate thesis [DGT]. These papers use Version 3 (V3) of New Induction which is the same phenomenon represented in legacy vectors and in legacy units.

For engineering applications of New Magnetism, the reader will have to wait until the New Electromagnetism V5 paper [EM04]. The New Magnetism V5 model is vastly superior to the V3 model which is now obsolete.

5 Pretonic Model of Matter (SOSOP)

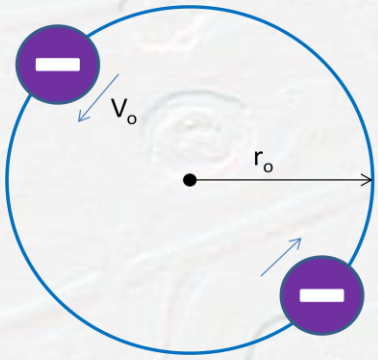
Over the years, there were three independent logical derivations that all arrived at the same conclusion that matter is a second order system of Pretons (SOSOP). These arguments are found in legacy papers --some only available to Patreon Subscribers. Instead of trawling through these exhaustive chains of logic, there is just one single "boiler-plate" argument that suffices:

If a property of matter can be derived as a field effect (synthesized); then it cannot be an intrinsic property of the components involved in the synthesis. For example, if mass can be derived from the Pretonic equations (synthetic mass), then Pretons cannot have mass (intrinsic mass); otherwise, nature would be redundant and there would be no way to disambiguate intrinsic mass from synthetic mass. Since there can be no ambiguity at the fundamental level of nature (17^{th} Rule of Acquisition).

Since every property of matter can be synthesized except Pretonic charge, then the most fundamental building block of matter must be Pretons.

5.1 Normal Matter SOSOP

Normal Matter is a system of like Pretons that counter orbit each other.



Equation 5-1: The SOSOP Normal Matter

Where

$\mathbf{r}_O =$ Orbital Radius

$\mathbf{V}_O =$ Orbital Velocity

$Q =$ Charge of Each Preton

5.1.1 Centripetal Acceleration

Care must be taken when accounting for the centripetal acceleration of the Pretons. The following diagram highlights the parameterization to be used.

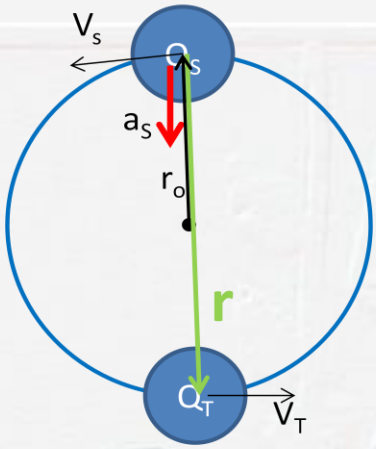


Figure 5-1: Parameterization

The Vortrix expression for the centripetal acceleration of the source with regard to r_O is shown by the following:

$$\mathbf{a}_S = \left[\mathbf{r}_O \setminus \mathbf{V}_S\right]\mathbf{V}_S$$

The back slash operator represents Vortrix left division.

It is preferred to express things in terms of the vector r so the above expression is modified as follows

$$\mathbf{a}_S = \frac{\left[\mathbf{V}_S\hat{\mathbf{r}}\right]\mathbf{V}_S}{\left|\mathbf{r}_O\right|}$$

Equation 5-2: Source Centripetal Acceleration

In the above expression we are only using the scalar magnitude of the orbital radius.

The Sum of the Pretonic forces at the Target

Substituting Equation 5-2 into Equation 4-1 yields

1) $$\mathbf{F}_T = Q_S Q_T\left(-\frac{\left[\mathbf{V}_S\hat{\mathbf{r}}\right]\mathbf{V}_S}{\left|\mathbf{r}_O\right|\left|\mathbf{r}\right|}+\frac{\left[\mathbf{V}_S/\hat{\mathbf{r}}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{\left|\mathbf{r}\right|^2}\right)$$

2) $$\mathbf{F}_T = Q_S Q_T\left(-\frac{\left[\mathbf{V}_S\hat{\mathbf{r}}\right]\mathbf{V}_S}{2\left|\mathbf{r}_O\right|^2}+\frac{\left[\mathbf{V}_S/\hat{\mathbf{r}}\right]\left(\mathbf{V}_T-\mathbf{V}_S\right)}{4\left|\mathbf{r}_O\right|^2}\right)$$

3) $$\mathbf{F}_T = Q_S Q_T\left(-\frac{\left[\mathbf{V}_S\hat{\mathbf{r}}\right]\mathbf{V}_S}{2\left|\mathbf{r}_O\right|^2}+\frac{\left[\mathbf{V}_S/\hat{\mathbf{r}}\right]\left(-2\mathbf{V}_S\right)}{4\left|\mathbf{r}_O\right|^2}\right)$$

4) $$\mathbf{F}_T = Q_S Q_T\left(-\frac{\left[\mathbf{V}_S\hat{\mathbf{r}}\right]\mathbf{V}_S}{2\left|\mathbf{r}_O\right|^2}+\frac{\left[\hat{\mathbf{r}}\mathbf{V}_S\right]\left(-2\mathbf{V}_S\right)}{4\left|\mathbf{r}_O\right|^2}\right)$$

Because $\mathbf{V}_S$ is perpendicular to $\hat{\mathbf{r}}$, swapping $\mathbf{V}_S$ and $\hat{\mathbf{r}}$ results in minus sign

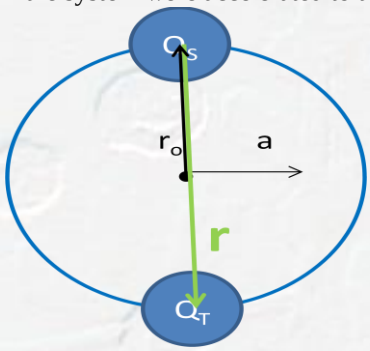
5) $$\mathbf{F}_T = Q_S Q_T \left(-\frac{[\mathbf{V}_S \hat{\mathbf{r}}]\mathbf{V}_S}{2|\mathbf{r}_O|^2} + \frac{2[\mathbf{V}_S \hat{\mathbf{r}}]\mathbf{V}_S}{4|\mathbf{r}_O|^2} \right)$$

6) $$\mathbf{F}_T = 0$$

The Sum of the forces equal zero allowing the system to remain stable.

5.1.2 Inertia ("Mass")

If the system were accelerated to the right as shown in the following diagram,



then the force on the target Preton due to the acceleration of the source is

1) $$\mathbf{F}_T = -Q_S Q_T \frac{\mathbf{a}_S}{2|\mathbf{r}_O|}$$

Since both Pretons act on each other in a similar manner, then the total force on the system is twice the interaction found in the step above. Also, since the charge on the Pretons are the same, substitute Q_P for source and target.

2) $$\mathbf{F} = -Q_P{}^2 \frac{\mathbf{a}}{|\mathbf{r}_O|}$$

An interesting thing occurs when half electron charges are substituted for the Preton charge and the orbital radius is replaced with a quarter of the classical electron radius and the result is multiplied by K_M to convert to legacy units

3) $$\mathbf{F} = -K_M \left(\frac{q_e}{2} \right)^2 \frac{\mathbf{a}}{|\mathbf{r}_e / 4|}$$

Reducing

4) $$\mathbf{F} = -\frac{\mu_0 (q_e)^2}{4\pi r_e}\mathbf{a}$$ Force in Newtons

Since inertial force is opposite in direction to the applied force then

5) $$\mathbf{F} = -M\mathbf{a}$$

Set step 4 equal to step 5 and solve for mass

$$M_e = \frac{\mu_0 (q_e)^2}{4\pi r_e} \text{ Kilograms}$$

Equation 5-3: Mass of Electron in Legacy Representation

The above equation results in the mass of an electron; or more appropriately, the inertia of an electron in kilograms.

5.1.3 Mass Disambiguation

[Link to original EMV video]

Mass was originally developed to disambiguate the quantity of stuff from the weight of stuff. In Ethereal Mechanics, mass is now disambiguated from the inertia of stuff. This is consistent with Einstein's Principle of Equivalence where weight and inertia were essentially equivalent. If weight needed to be disambiguated from quantity, then so too should inertia; otherwise, they are not truly equivalent.

Because inertia (formerly mass) is synthesizable from a state of the Pretons, it cannot also exist as an intrinsic property of Pretons [ROA11] otherwise that would result in an ambiguity which is a violation of the 17th Rule of Acquisition [ROA17].

In order to disambiguate mass (the quantity of stuff) from the inertia of stuff, a new symbol is required. The Symbol B is repurposed (from legacy magnetism) to represent inertia such that Newton's model is modernized as follows

$$\mathbf{F} = B\mathbf{a} \quad \text{Applied Force in square amperes}$$

Equation 5-4: Newton's Force Model in Natural Units

When a blob of matter is accelerated, its inertia opposes the applied force. The inertial force is

$$\mathbf{F} = -B\mathbf{a}$$

Equation 5-5: Inertial Force Model

The new unit is called the "Burl" ("Burls" for plural) and is a shortening of the word burly which essentially means heavy.

Setting the above equal to Equation 4-2 , multiplying by 2 for the contribution of each of the two Pretons, and replacing r with twice the orbital radius (r_O) results in

$$B = \frac{Q_P^{\,2}}{r_o} \quad \text{Inertia in Burls (square coulombs per meter)}$$

Equation 5-6: Inertia of a binary Pretonic system

Where:
Q_P is the Pretonic charge, in Coulombs, of a single Preton. For Electron use ½ of unit charge.
r_O is the orbital radius of the system. For Electron use ¼ of classical electron radius.

Again, to convert Burls to the legacy units of inertia (Kilograms) multiply by K_M.

$$M = K_M B = \left(\frac{\mu_0}{4\pi}\right)\frac{Q_P^{\ 2}}{r_o} \quad \text{Kg}$$

Equation 5-7: Conversion between legacy and natural inertia

5.1.4 The Constants Mu and K_M

The electromagnetic constant Mu (μ_0) has long been an arbitrary constant of relation used in classical magnetic field calculations. Ethereal Mechanics exposes this constant as simply the ratio of Legacy Inertia ("mass" in Kg) to Natural Inertia (Burls in square coulombs per meter). In Ethereal Mechanics, Mu is combined with the constant 4π to form the constant K_M which is used to convert between Legacy and Natural units (See section 2.3).

In a future iteration of Ethereal Mechanics the 4π may be moved elsewhere. The present convention is more convenient for a number of reasons. The first reason is that K_M works out to a nice simple, rational value

$$K_M = \frac{\mu_0}{4\pi} = 1\times10^{-7} \quad \frac{Kg\,m}{Q^2} = \frac{Kg}{B}$$

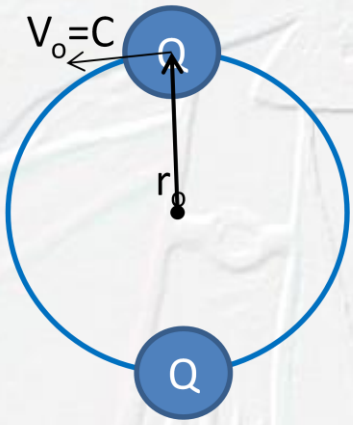
Equation 5-8: Km

Secondly, this convention allows Natural Units to align with the CGS system in terms of value (not units).

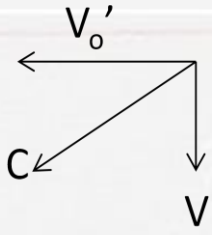
Note: The relative permeability (μ_r) values of magnetic materials remain unchanged. The follow-on paper, New Electromagnetism V5 [EM04], demonstrates the application of these values.

5.1.5 Process Dilation ("Time Dilation")

The System is considered "At Rest" when the Pretons are spinning around a stationary center of rotation (stationary with respect to the medium). In this situation the Orbital Velocity of the Pretons is the speed of light (C) as shown in the following diagram.



If the system were set in motion such that it were traveling up, out of the page at velocity V, then this would cause the Orbital Velocity of the Pretons to slow such that the combined velocity does not exceed C.



The orbital velocity of the system in motion is found by simple Pythagorean math

1) $C^2 = V_O^{'2} + V^2$

Solving for V_O'

2) $V_O^{'} = \sqrt{C^2 - V^2}$

Divide by orbital velocity at rest.

3) $\frac{V_O^{'}}{V_O} = \frac{\sqrt{C^2 - V^2}}{C}$

$$\frac{V_O^{'}}{V_O} = \sqrt{1 - \frac{V^2}{C^2}} = \text{Process ("Time") Dilation}$$

Equation 5-9: Process Dilation Relationship

It is not time which is changing as the theory of Relativity claims. Instead it is the interior material processes that slow. If Relativity had a model for matter; this mistake would not have been made.

5.1.6 Inertia increase with speed

[UNFINISHED]

In order to explain an increase in inertia with speed, length and width both have to contract. The Transvariance Simulation software shows that the Michelson-Morley simulation from Transvariance experiment [EM01] can be fully satisfied with both length and width contraction.

Until completion of the investigation, this section is left unfinished.

5.1.7 Length Contraction

[UNFINISHED]

Because of section 5.1.6, this section is also unfinished pending further investigation

5.1.8 The Electric Force (Coulomb Force)

In this chapter, the electric force (A.K.A Coulomb) is derived from Pretonic interactions between Second Order Systems of Pretons (SOSOP). This section demonstrates that there is a inverse square radial force between two SOSOPs and that this phenomenon is just a byproduct of the Pretonic forces and SOSOP behavior. There are no actual Coulomb charges.

The interactions between two SOSOPS are extremely complex; this section only considers the radial force component between two SOSOPs which matches the behavior of the Coulomb force. The other force components are discussed elsewhere.

This derivation begins by hand deriving the radial force for three major orientations to demonstrate the overall characteristics of the field. This is followed by the results of computer simulation which computes the interactions for every permutation.

Edge to Edge Orientation, Charges Inline, Inertial Force

The derivation for the radial force component begins by considering the following diagram which shows two SOSOPs oriented edge to edge separated by distance d. The spin vectors of the SOSOPs are parallel and directed up out of the page. This derivation considers only the inertial force component because this is the easiest to derive making it the best place to begin. The Magnetic Force component is computed in a later section.

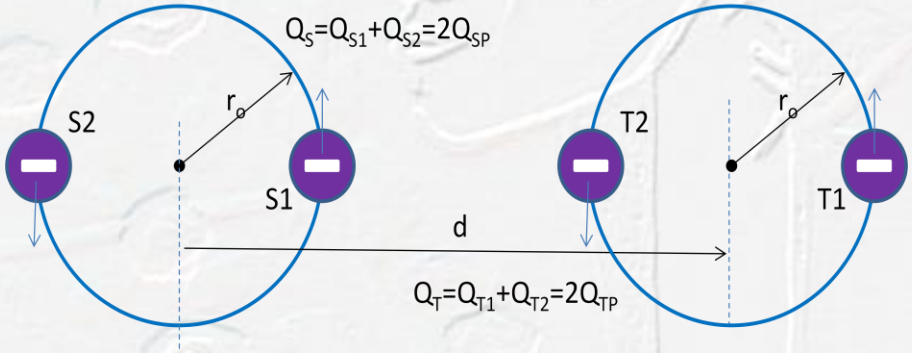


Figure 5-2: The Dual SOSOP Orientation 1

The derivation applies the Inertial force model from each of the source Pretons to each of the target Pretons.

1) $$\mathbf{F}_T = \mathbf{F}_{S1T1} + \mathbf{F}_{S1T2} + \mathbf{F}_{S2T1} + \mathbf{F}_{S2T2}$$

2) $$\mathbf{F}_T = -Q_{S1}Q_{T1}\left(\frac{\mathbf{a}_{S1}}{d}\right) - Q_{S1}Q_{T2}\left(\frac{\mathbf{a}_{S1}}{d-2r_O}\right) - Q_{S2}Q_{T1}\left(\frac{\mathbf{a}_{S2}}{d+2r_O}\right) - Q_{S2}Q_{T2}\left(\frac{\mathbf{a}_{S2}}{d}\right)$$

3) $$\mathbf{F}_T = -Q_{SP}Q_{TP}\mathbf{a}_{S1}\left(\frac{1}{d}+\frac{1}{d-2r_O}\right) - Q_{SP}Q_{TP}\mathbf{a}_{S2}\left(\frac{1}{d+2r_O}+\frac{1}{d}\right)$$

4) $$\mathbf{F}_T = -Q_{SP}Q_{TP}\mathbf{a}_{S1}\left(\frac{1}{d}+\frac{1}{d-2r_O}-\frac{1}{d+2r_O}-\frac{1}{d}\right)$$

5) $$\mathbf{F}_T = -Q_{SP}Q_{TP}\mathbf{a}_{S1}\left(\frac{4r_O}{d^2-4r_O{}^2}\right)$$

Since the Pretons move at the speed of light the centripetal acceleration is given by

$$\mathbf{a}_S = -\frac{C^2\hat{\mathbf{r}}_{OS}}{|\mathbf{r}_{OS}|}$$

Since $\hat{\mathbf{r}}_{OS1}$ is parallel to d we substitute $\hat{\mathbf{d}}$, and since $\hat{\mathbf{r}}_{OS2}$ is in the opposite direction to d we substitute $-\hat{\mathbf{d}}$ to arrive at the expression for the Preton acceleration for each source.

$$\mathbf{a}_{S1} = -\frac{C^2\hat{\mathbf{d}}}{|\mathbf{r}_{OS}|}$$

Substituting yields

$$\mathbf{F}_T = Q_{SP}Q_{TP}\frac{C^2}{r_O}\left(\frac{4r_O}{d^2-4r_O{}^2}\right)\hat{\mathbf{d}}$$

$Q_{SP}=Q_S/2$ and $Q_{TP}=Q_T/2$

$$\mathbf{F}_T = \frac{C^2Q_SQ_T}{d^2-4r_O{}^2}\hat{\mathbf{d}}$$

Equation 5-10: Reference Small Scale Electric Force Model (Resting)

The above equation is only for reference because at distances small enough such that r_O matters, there are a plethora of other interactions between these systems that are significant and are discussed in detail in a follow-on document. The important thing to consider is that the Force goes asymptotic at a distance of $d=2r_O$. This would seem to prevent the rotating systems from intermingling.

Under the conditions where the Coulomb force is measured, the distance d is much-much-much greater than r_O and the relationship reduces to.

$$\mathbf{F}_T = \frac{C^2Q_SQ_T}{d^2}\hat{\mathbf{d}} \quad \text{For } d>>r_O$$

Equation 5-11: Resting Large Scale Electric Force Model

The above equation is the Resting Electric Force model for New Electromagnetism V5. In section 5.1.9, this model is multiplied by Km to convert it to legacy units which matches Coulomb's Law. This demonstrates that the electric field is actually a byproduct of the normal operation of matter and that actual Coulomb charges do not exist.

Face to Face Orientation, Magnetic Force

The derivation of the radial force continues by considering the following diagram showing two SOSOPs separated by distance d. The SOSOPs are oriented such that their spin normals (not shown) are parallel to d. The Inertial force component is not considered in this orientation because it does not contribute to the radial force.

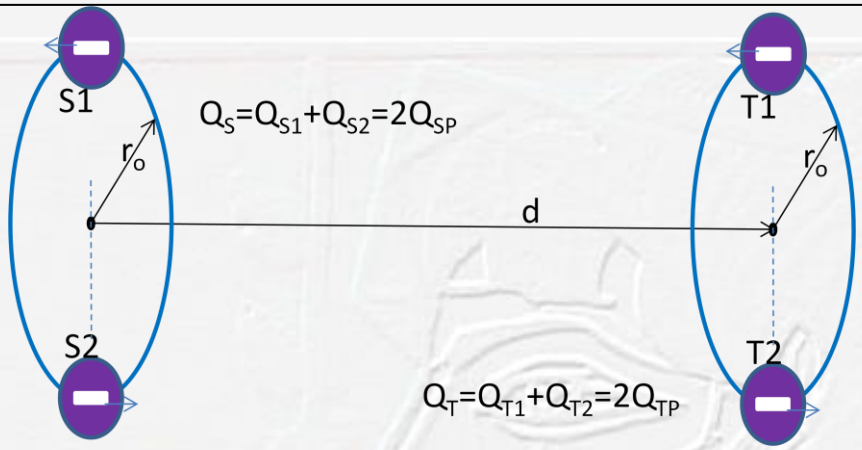


Figure 5-3: Dual SOSOP orientation 2

Begin by considering the interactions between each source and target Preton.

1) $\mathbf{F}_T = \mathbf{F}_{S1T1} + \mathbf{F}_{S1T2} + \mathbf{F}_{S2T1} + \mathbf{F}_{S2T2}$
   Taking advantage of symmetry
2) $\mathbf{F}_T = 2(\mathbf{F}_{S1T1} + \mathbf{F}_{S1T2})$
   For $d >> r_O$
3) $\mathbf{F}_T = 2(\frac{Q_{SP}Q_{TP}\left[\mathbf{V}_S / \hat{\mathbf{d}}\right](\mathbf{V}_{T1} - \mathbf{V}_{S1})}{d^2} + \frac{Q_{SP}Q_{TP}\left[\mathbf{V}_S / \hat{\mathbf{d}}\right](\mathbf{V}_{T2} - \mathbf{V}_{S1})}{d^2})$
   Combining
4) $\mathbf{F}_T = 2Q_{SP}Q_{TP}(\frac{\left[\mathbf{V}_S / \hat{\mathbf{d}}\right](\mathbf{V}_{T1} - \mathbf{V}_{S1} + \mathbf{V}_{T2} - \mathbf{V}_{S1})}{d^2})$
   Substituting $V_{T1}= V_{S1}$ and $V_{T2}=-V_{S1}$. This essentially shows that the target contributes nothing to the coulomb effect. This is an important concept which is seen again in the next section.
   Continuing
5) $\mathbf{F}_T = 2Q_{SP}Q_{TP}(\frac{\left[\mathbf{V}_{S1} / \hat{\mathbf{d}}\right](-2\mathbf{V}_{S1})}{d^2})$
   The right divide of a unit vector is equivalent to a left multiply of a unit vector, also the (-2) is Scalar so it can be commuted out.
6) $\mathbf{F}_T = -4Q_{SP}Q_{TP}(\frac{\left[\hat{\mathbf{d}}\mathbf{V}_{S1}\right](\mathbf{V}_{S1})}{d^2})$
   The direction of the Vortrix product $\left[\hat{\mathbf{d}}\mathbf{V}_{S1}\right](\mathbf{V}_{S1})$ results in the reflection of $\hat{\mathbf{d}}$ about $\mathbf{V}_{S1}$.
   Because $\hat{\mathbf{d}}$ and $\mathbf{V}_{S1}$ are orthogonal in this situation, the resulting direction is $-\hat{\mathbf{d}}$. The magnitude of the result is the product of all the vector magnitudes which is $[1V_{S1}](V_{S1}) = {V_{S1}}^2$ for a combined result of $-{V_{S1}}^2\hat{\mathbf{d}}$. Substituting
7) $\mathbf{F}_T = \frac{4Q_{SP}Q_{TP}{V_{S1}}^2}{d^2}\hat{\mathbf{d}}$

   Then Preton speed is C, $Q_{SP}=Q_S/2$ and $Q_{TP}=Q_T/2$

8) $\mathbf{F}_T = \frac{C^2 Q_S Q_T}{d^2}\hat{\mathbf{d}}$ For d>>r_O

Again, the results are a radial force model consistent with the Coulomb force.

.

Edge to Edge Orientation, Charges Transverse, Magnetic Force

This section considers a third orientation where the SOSOPs are again exposing their edges to each other such that their spin vectors are parallel and directed up out of the page. The difference between this orientation and the first is that the Pretons are transverse to the vector d as opposed to being in line. In this section only the magnetic force is considered because the inertial force vector is orthogonal to the vector d.

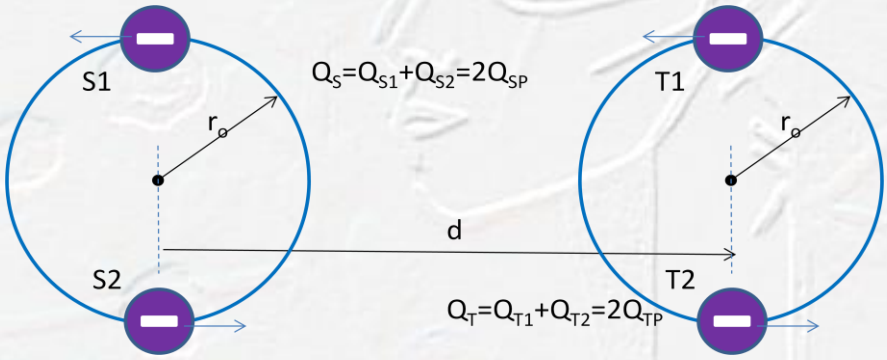


Figure 5-4: Dual SOSOP orientation 3

Begin by identifying the source to target interactions

1) $\mathbf{F}_T = \mathbf{F}_{S1T1} + \mathbf{F}_{S1T2} + \mathbf{F}_{S2T1} + \mathbf{F}_{S2T2}$
Simplifying for d>>r_O.

2) $\mathbf{F}_T = \frac{Q_{SP}Q_{TP}}{d^2}\left(\left[\mathbf{V}_{S1}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{T1}-\mathbf{V}_{S1}+\mathbf{V}_{T2}-\mathbf{V}_{S1}\right)+\left[\mathbf{V}_{S2}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{T1}-\mathbf{V}_{S2}+\mathbf{V}_{T2}-\mathbf{V}_{S2}\right)\right)$
Substituting V_{S2}= -$V_{S1,}$ V_{T1}= V_{S1} and V_{T2}=-V_{S1}.

3) $\mathbf{F}_T = -4\frac{Q_{SP}Q_{TP}}{d^2}\left(\left[\mathbf{V}_{S1}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{S1}\right)\right)$
Again, when d>>r_O, the effects of the target velocities cancel which means that the net force on the target does not depend on the orientation of the target. To be clear, there is torque present at the target that is orientation dependent.
Substituting V_{S2}= -V_{S1}

4) $\mathbf{F}_T = -4\frac{Q_{SP}Q_{TP}}{d^2}\left[\hat{\mathbf{d}}\mathbf{V}_{S1}\right]\left(\mathbf{V}_{S1}\right)$
Because d and Vs are parallel (opposite directions), the reflection of d does not cause an inversion and the minus sign is not cancelled. The result is

5) $\mathbf{F}_T = -4\frac{V_{S1}{}^2 Q_{SP}Q_{TP}}{d^2}\hat{\mathbf{d}}$
Then Preton speed is C, Q_{SP}=Q_S/2 and Q_{TP}=Q_T/2

6) $\mathbf{F}_T = -\frac{C^2 Q_S Q_T}{d^2}\hat{\mathbf{d}}$ For d>>r_O

This is very interesting, except for the sign, the result matches the Coulomb force.

The Edge Orientation, Charges inline, Magnetic force

Returning to the first orientation (Figure 5-2) to consider the magnetic force

1) $\mathbf{F}_T = \mathbf{F}_{S1T1} + \mathbf{F}_{S1T2} + \mathbf{F}_{S2T1} + \mathbf{F}_{S2T2}$
Simplifying for d>>r_O.

2) $\mathbf{F}_T = \frac{Q_{SP}Q_{TP}}{d^2}\left(\left[\mathbf{V}_{S1}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{T1}-\mathbf{V}_{S1}+\mathbf{V}_{T2}-\mathbf{V}_{S1}\right)+\left[\mathbf{V}_{S2}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{T1}-\mathbf{V}_{S2}+\mathbf{V}_{T2}-\mathbf{V}_{S2}\right)\right)$
Substituting V_{S2}= -V_{S1}, V_{T1}= V_{S1} and V_{T2}=-V_{S1}.

3) $\mathbf{F}_T = -4\frac{Q_{SP}Q_{TP}}{d^2}\left(\left[\mathbf{V}_{S1}/\hat{\mathbf{d}}\right]\left(\mathbf{V}_{S1}\right)\right)$
Again, when d>>r_O, the effects of the target velocities cancel which means that the net force on the target does not depend on the orientation of the target. To be clear, there is torque present at the target that is orientation dependent.
Substituting V_{S2}= -V_{S1}

4) $\mathbf{F}_T = -4\frac{Q_{SP}Q_{TP}}{d^2}\left[\hat{\mathbf{d}}\mathbf{V}_{S1}\right]\left(\mathbf{V}_{S1}\right)$
Using the same reflection identity, this time d and Vs are orthogonal; therefore, the reflection results in a negation which reduces to

5) $\mathbf{F}_T = 4\frac{V_{S1}{}^2 Q_{SP}Q_{TP}}{d^2}\hat{\mathbf{d}}$
Then Preton speed is C, Q_{SP}=Q_S/2 and Q_{TP}=Q_T/2

6) $\mathbf{F}_T = \frac{C^2 Q_S Q_T}{d^2}\hat{\mathbf{d}}$ For d>>r_O

Again, a perfect match with the Coulomb force.

Considering all of the Orientations

Using a computer program, the interactions between source and target SOSOPS over the entire set of spherical coordinates is determined.

Figure 5-5: Simulation over all Orientations

The simulation confirms the observation made in the derivations which suggest that the shape of the radial force pattern is not affected by the orientation of the target. This allows the visualization of the radial force using the following diagrams which are similar to those used in spherical harmonics. Figure 5-6 shows the

force pattern as viewed from the edge of the SOSOP with the spin vector shown in yellow. Figure 5-7 shows a cross section of the field cut through the plane of rotation. The numbers represent the magnitude of the radial force relative to the Coulomb force.

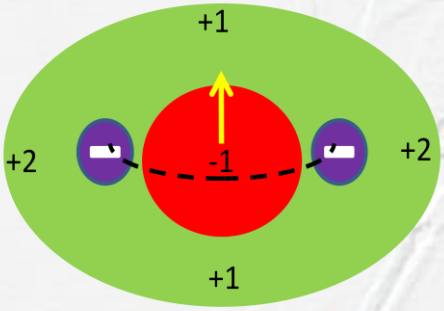


Figure 5-6: Radial Force Pattern: Side View (hand drawn)

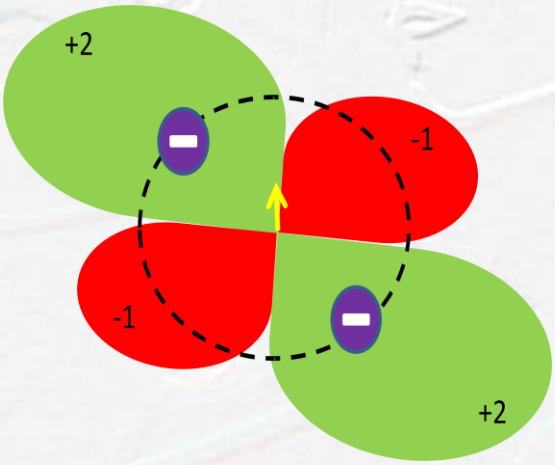


Figure 5-7: Radial Force Pattern: Oblique Cross Section (hand drawn)

The figures show that the force is twice that of the Coulomb force inline with the Pretons. The radial force is equal to Coulomb force in directions that are perpendicular to the plane of rotation and equal and opposite to the Coulomb force transverse to the Pretons along the plane of rotation. These computer results are consistent with the derivations performed earlier.

When the force is averaged over the entire sphere, the average converges on ¾ that which would be expected from the Coulomb force. The 25% error is being investigated; there are a number of possibilities. One possibility is a software error in the way average was taken. Another possibility is that the way electrons arrange themselves on a charge conductor hides their asymmetry. For instance, averaging the field is a SOSOP as it rotates through a single orientation results in the following field geometry

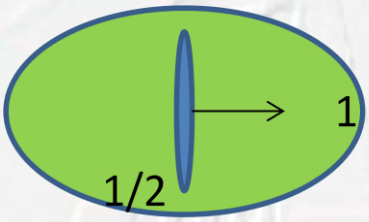


Figure 5-8: The Radial Field Relative Intensity of source averaged over a single orientation

In the direction normal to the plane of rotation, the radial force is exactly equal to what is expected from the Coulomb model. The average in the plane of rotation is ½. When a spherical conductor is charged by adding excess electrons then, according to the computer simulation, the excess charges radiate to the outside and arrange themselves as follows

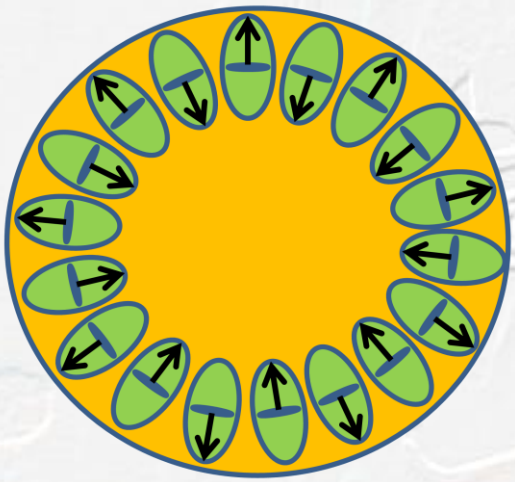


Figure 5-9: A Charged Sphere

This arrangement explains two interesting phenomena about charged conductors. The alternating arrangement of spin prevents the formation of a net magnetic field. Secondly, because the SOSOPs are presenting their unity end outward, this could explain why the Coulomb field was assumed to be spherical about an electron.

This discussion is continued in the paper Ethereal Mechanics: New Electromagnetism V5 [EM04].

The next section demonstrates how these relationships relate to the Coulomb field of classical electrodynamics.

5.1.9 Coulomb's "Law" and the constant Epsilon

To convert the Resting Large Scale Electric Force (Equation 5-11) model to the Legacy unit of force, multiply both sides by K_M

$$\mathbf{F}_T = K_M \frac{C^2 Q_S Q_T}{d^2} \hat{\mathbf{d}}$$

Substitute Km

$$\mathbf{F}_T = \frac{\mu_0 C^2 Q_S Q_T}{4\pi d^2} \hat{\mathbf{d}}$$

The following well known relationship between the electromagnetism constants is presented

$K_E = \frac{1}{4\pi\varepsilon_0} = \frac{C^2\mu_0}{4\pi}$ (See Wiki/Coulomb_constant)

$$\mathbf{F}_T = K_E \frac{Q_S Q_T}{d^2}\hat{\mathbf{d}}$$

Equation 5-12: The Resting Coulomb Force Model

In legacy electrodynamics, physicists tried valiantly to reconcile the value ε_0 (epsilon) in terms of something other than an arbitrary constant of relation which resulted from the regression of experimental data. Doing so enabled them to believe that they were actually in possession of a "Law" of nature. Their efforts led them to believe that epsilon represented the permittivity of free space. This is in contrast with Ethereal Mechanics which shows that the proper electric field model only needs the constant C^2 which results from the natural processes of matter and has absolutely nothing to do with the Coulomb force's ability to penetrate/permeate free space.

5.1.10 Transvariant Large Scale Electric Force

Because the amplitude of the radial force model is a function of the tangential velocities of the Source Pretons, then any slowing of the tangential velocity affects the magnitude of the Radial force. Because section 5.1.5 demonstrates that the material process of the SOSOP slow according to the Equation 5-9, then the radial force model must be compensated accordingly.

$$\mathbf{F}_T = \frac{\left(C\sqrt{1-\frac{V^2}{C^2}}\right)^2 Q_S Q_T}{d^2}\hat{\mathbf{d}}$$

$$\mathbf{F}_T = \frac{\left(C^2 - V^2\right) Q_S Q_T}{d^2}\hat{\mathbf{d}}$$

Equation 5-13: Transvariant Large Scale Electric Force Model

An interesting fact is that the above relationship was obtained by this author from classical electromagnetism by combining Coulomb's model with F=QVxB [T19 https://www.youtube.com/watch?v=zrGuFcoPCxQ]. This led to the false conviction that process dilation was a magnetic field phenomenon which caused years of delay exploring theories that just went nowhere. In fact, when NEV5 was derived, it was discarded because it did not have the parallel motion component (Term 4 of NEV3) that explained time dilation. As a happy accident, NEV5 was inadvertently left in the simulation software when the rotating magnet experiments were run. The simulations matched the experiments exactly. Six more months were spent trying to find experiments that would fault the new models. None were found.

That the behavior of matter is embedded in the observed forces is not an alien concept anymore.

5.1.11 Gravitational Field

A gravitational field is a region of space where Ether is accelerating toward a blob of matter. Ether accelerates toward a blob of matter because matter must feed to exist, and Ether is the fuel. Since matter is composed of Pretons, it is the Pretons that feed.

At this time, one mode of Preton feeding is known. In this mode, Pretons feed when they accelerate relative to the medium. It's essentially acceleration times cross sectional area of the Preton.

The other mode of feeding will be released in the New Energy Paradigm paper at a later time. It will show that the feeding modes of a SOSOP in translation change and this affects the overall energy of the system. For now, only a stationary SOSOP is discussed. In this case, the forces in the system are in balance;

therefore, if the feeding of one component of force is known, then the other feeding mode must result in the identical consumption. So whatever is attained in this step is multiplied by two for the total feeding of a stationary SOSOP.

In a SOSOP, Preton acceleration is given by

$$a = \frac{C^2}{\mathrm{r_O}}$$

Multiply both sides by the cross sectional area of a Preton A_P . Then multiply by 2 to account for the contribution of the two Pretons in the SOSOP

$$aA_P = \frac{2C^2}{\mathrm{r_O}} A_P \quad \text{Cubic Meters of Ether Per Sec}^2$$

To find the Ethereal acceleration at some distance d from the point of consumption, divide by the area of a sphere

$$a_E = \frac{C^2}{\mathrm{r_O}} \frac{A_P}{2\pi d^2} \quad \text{Meters Per Sec}^2$$

For the small scale model, use the simplification that Ether flows linearly inward toward the location of consumption (The large scale model is slightly different; it is developed in the Cosmology paper [EM05]). Assigning a simple inward direction vector (negative sign)

$$\mathbf{a}_E = -\frac{C^2}{\mathrm{r_O}} \frac{A_P}{2\pi d^2} \hat{\mathbf{d}} \quad \text{Meters Per Sec}^2$$

Since gravity is believed to be proportional to what physicists call mass, and Ethereal Mechanics disambiguates mass from inertia (B). We should like to keep this proportionality for the time being (until more is learned later). In the above equation, C and A_P are constants, so the only unknown parameter that could represent a variable amount of inertia is $\mathrm{r_O}$. Since the model of inertia (B) contains $\mathrm{r_O}$, then solve inertia (Equation 5-6) for $\mathrm{r_O}$ and substitute into the above to yield

$$\mathbf{a}_E = -\frac{C^2 A_P}{{Q_P}^2 2\pi} \frac{B}{d^2} \hat{\mathbf{d}} \quad \text{Meters Per Sec}^2$$

Replacing Preton cross sectional area with $A_P = \pi {r_P}^2$

$$\mathbf{a}_E = -\frac{1}{2}\left(\frac{{r_P}^2 C^2}{{Q_P}^2}\right) \frac{B}{d^2} \hat{\mathbf{d}} \quad \text{Meters Per Sec}^2$$

The term in parenthesis is essentially the natural form of the gravitational constant G (This is demonstrated in the next section). Because the Gravitational constant is supposedly a constant, then the ratio between the Pretonic radius (r_P) and Pretonic charge (Q_P) must be a constant. The next section goes into more detail. For the mean time, substitute K_P for that ratio to simplify.

$$\mathbf{a}_E = -\frac{1}{2}\left(C^2 K_P^2\right)\frac{B}{d^2}\hat{\mathbf{d}} \quad \text{Meters Per Sec}^2$$

5-14: SOSOP Inertial Force Feeding

Finally, the above represents only the feeding from one Force, accounting for the feeding for the other force

$$\mathbf{a}_E = -C^2 K_P^2 \frac{B}{d^2}\hat{\mathbf{d}} \quad \text{Meters Per Sec}^2$$

Equation 5-15: Small Scale Gravity Field Model

This is the gravitational field for small scale, stationary applications. The simple field geometry is distorted over very large distances and time scales. These distortions are covered in the paper Ethereal Mechanics: Cosmology [EM05] which develops the large scale gravity model.

Rearranging to demonstrate something interesting

$$\mathbf{a}_E = -BC^2 K_P{}^2 \frac{\hat{\mathbf{d}}}{d^2} \quad \text{Meters Per Sec}^2$$

It should now be plain to see that the above expression contains a natural form of the matter energy relationship ($E = BC^2$). This will become more interesting when this discussion is continued in the New Energy Paradigm paper.

5.1.12 The Constants G and K_P

Since it is argued that Ether accelerating toward a mass is the field of gravity, consider this argument from Newton's Gravity Model with the objective of unpacking the arbitrary constant of relation G.

$$\mathbf{F}_T = -\frac{GM_S M_T}{d^2}\hat{\mathbf{d}}$$

Solve for the Ethereal acceleration at the location of the target mass by dividing both sides by target mass.

$$\frac{\mathbf{F}_T}{M_T} = \mathbf{a}_E = -\frac{GM_S}{d^2}\hat{\mathbf{d}}$$

Set the above equal to Equation 5-15 and simplify

$$GM_S = K_P{}^2 C^2 B$$

Substitute the electron mass (M_e) as the source mass on the left side and the electron inertia (B_e) on the right side and swap Kp back.

$$GM_e = \frac{r_P{}^2 C^2 B_e}{Q_P{}^2}$$

Then substitute both of the following expressions into the above

$$M_e = K_M B_e = \frac{\mu_0}{4\pi} B_e$$

$$Q_P = \frac{q_e}{2}$$

To arrive at

$$G = \frac{16\pi C^2}{\mu_0}\frac{r_P^{\,2}}{q_e^{\,2}}$$

5-16: The Constant G in Legacy Units

Solving the above for r_P results in

$$r_P = 6.903393126\times10^{-37} \text{ meters}$$

Equation 5-17: Radius of Negative Preton (assuming it is spherical)

Because G is a constant, it is logical to infer that the radius of a Preton to the charge of a Preton is also a constant.

$$K_P = \frac{r_P}{Q_P} = \frac{r_P}{q_e/2} = 8.6175181683\times10^{-18} \text{ meters per coulomb}$$ (revise for significant digits)

Equation 5-18: K_P, Preton radius to charge constant

$$G = \frac{4\pi C^2}{\mu_0}K_P^{\,2}$$

Equation 5-19: The Legacy Constant G

A natural form of the constant G might be desirable. Begin with the Ether acceleration equation from the beginning of this section.

$$\mathbf{a}_E = -\frac{GM_S}{d^2}\hat{\mathbf{d}}$$

Then substitute the source mass (M_S) with natural inertia multiplied by K_M ($K_M B_S$).

$$\mathbf{a}_E = -\frac{GK_M B_S}{d^2}\hat{\mathbf{d}}$$

Since the legacy component (μ_0) of G and K_M cancel, the remainder is all natural.

$$K_G = GK_M = C^2 K_P^{\,2}$$

Equation 5-20: Natural Constant K_G

Substituting K_G back into the Ethereal Acceleration equation yields

$$\mathbf{a}_E = -\frac{K_G B_S}{d^2}\hat{\mathbf{d}}$$

Equation 5-21: Alternate Ethereal Acceleration about Generic Matter

5.1.13 Gravitational Force

As described previously, a gravitational field is the acceleration of Ether toward a "source" object (composed of one or more SOSOPs) that is consuming the Ether. It is called a source because it is the source of the field even though the field is actually a sink of Ether. The field couples to another object as inertial force (Equation 4-2) which shows that the gravitational force and the inertial force are the same

thing. The Inertial Force model produces a force on a SOSOP in the opposite direction of the vector acceleration of the object relative to the medium. For inertial force, it is the object that is accelerating; for gravitational force, it's the medium that is accelerating.

Expressing Newton's force model in terms of the difference in acceleration between the Ether and the target object results in

$$\mathbf{F}_{IT} = B_T(\mathbf{a}_E - \mathbf{a}_T)$$

Equation 5-22: Newtonian Inertial Force Model (Small Scale)

Similar to the Speed of Force concept discussed in section **Error! Reference source not found.**, if an object is accelerating at the same rate as the medium, there is no coupled force. This explains why observers in free fall feel weightless.

5.1.14 Energy

[UNFINISHED] This is being deferred to the paper titled The New Energy Paradigm
E=MC2
Energy Conservation
Energy Consensus
Energy Density of Ether

5.1.15 Modes of Collapse

[UNFINISHED] This is being deferred to the paper titled The New Energy Paradigm

5.2 Anti-Inertia SOSOP

A SOSOP can be formed from a Positive and Negative Preton. Although the Force equations resolve to zero just as the normal matter SOSOP does, the system has negative inertia. The slightest external force applied to this system will cause it to accelerate away until its velocity is limited by the speed of the Pretonic field (The Speed of light). Because the Pretons feed from the Ether, there is no issue with over unity.

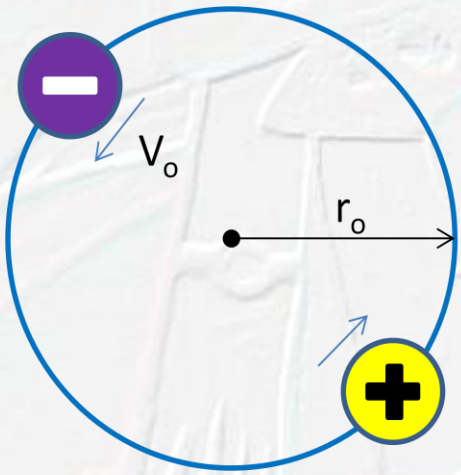


Figure 5-10: Anti-Matter SOSOP

In previous releases, this system was called anti-matter because of its anti-inertial properties. Required are more computer simulations to determine the properties of this system to include the Magnetic and Electric field geometries. Is this a Neutrino? This construct is the topic of a separate paper.

5.2.1 Gravlev Drive

Because this phenomenon is theoretically limited to the speed of light, it cannot be used for FTL travel between the stars. This technology could form the basis of lifting units that could move large amounts of people and material off the face of the Earth to an orbital space port where FTL ships would take them where they want to go.

6 Faster Than Light

The ultimate goal of Ethereal Mechanics is to develop the means to bring humanity to the stars in order to save the human race and protect the ecosystem of the Earth. The best calculation I have suggests that humanity must break the light barrier by at least a factor of 500 in order to survive [T1].

According to the work in this paper, it is not possible for matter to travel faster than the speed of light relative to the medium; so how is this dream going to become a reality? The key phrase here is "Relative to the Medium." A potential solution is to develop a starship that drags Ether with it in such a way that the ship and its passengers do not exceed the speed of light within the "bubble". This is analogous to the way that a modern jet airliner carries air with it in the cabin. Although the aircraft may be moving through the atmosphere at over 600 mph; the passengers inside the cabin are not moving relative to the air in the cabin. Imagin how horrible a 4 hour flight would be if passengers were exposed to the 600 mph wind, low pressure and cold that exists outside the "bubble" of the cabin.

An interesting idea comes from vortex rings. The following picture shows a smoke ring. The ring is not actually a manifestation of smoke, rather it is a vortex ring of air and the smoke particles are trapped inside a vortex ring. It is fascinating how vortex rings travel as though they are coherent objects.

Figure 6-1: Vortex Ring (Smoke Ring)

Figure 6-2 show a conceptual drawing of a starship that runs inside an ether vortex ring. The ship is disk shaped and the picture shows the cross section from the side. The red circles represent the ring vortex generator which is a ring shaped construct at the outermost edges of the ship. The flow of Ether about the ship is represented by the dashed circles.

The direction of travel is shown by the blue arrow. The ring generators generate the vortex ring in such a way that oncoming ether is swept aside like a snow plow.

The crew decks of the ship are represented by the white rectangles. The small blue arrowheads show what direction is up with respect to the way the crew will experience the artificial gravity created by the ring generators. In essence, the crew is traveling feet first toward their destination just as passengers riding a down elevator.

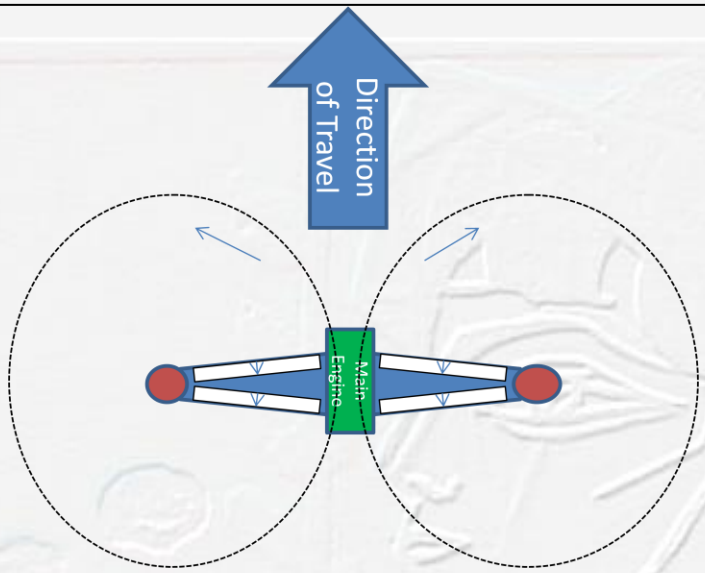


Figure 6-2: Conceptual Drawing of Ethonic Ring Cruiser

The final picture shows how Ring Ships could be connect together to form a larger ship. A modular ship such as this would be an absolute necessity for a deep space missions far away from rescue or repair facilities. In this concept there is redundancy and damaged portion could be swapped out or discarded. Furthermore, individual ring ships could be separated from the mother ship to fan out to explore new solar systems or serve as shuttles for away missions.

This is just a conceptual exercise; the missing pieces of Ethonics need to be filled in before any research and development can begin in this regard.

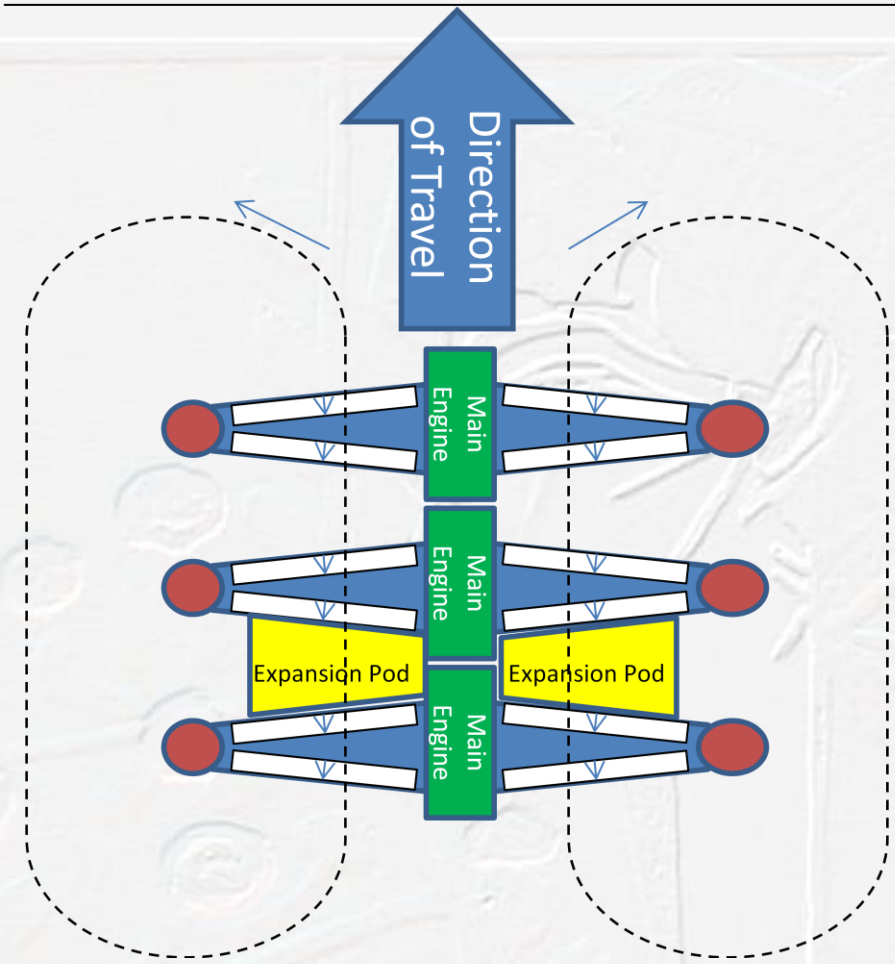


Figure 6-3: Larger Ship formed from Ring Cruisers

7 Conclusion

Electrogravity demonstrates a simple unification of the forces of nature as well as the derivation of the properties of matter and physical constants from a simple model of matter coupled with an Ether model. Although Ethereal Mechanics is not yet complete, it is a far more coherent model than the three-ring circus comprising General Relativity, Quantum Mechanics and Maxwell's Equations which are no closer to being unified than they were a century ago.

General Relativity has a model for gravity but does not have a model of matter. Gravity is generated by matter and affects matter; however, Relativity embarrassingly does not have a model of matter which shows how the generation or coupling occur. Furthermore, Einstein claims that gravity and inertia are equivalent yet the space time fabric model is incapable of explaining Inertia.

Conversely, Quantum Mechanics (QM) supposedly explains the existence of matter; however, it does not even acknowledge the existence of gravity. The strange television shows about QM tout over and over about how QM awesomely obtains the correct answers to everything that it is applied to in a desperate tone that sounds more like they are trying to convince themselves. They then proceed to enchant the audience about how strange QM is so they can end by saying that QM is so strange that it does not explain anything in the real world.

Then there is Maxwell's Equations which is the most useful of the three; in spite of, the flaws, ambiguities and inconsistencies.

Electrogravity is followed by "Ethereal Mechanics: New Electromagnetism V5" [EM04] which demonstrates the application of the Inertial Force, and Magnetic Force models, to real world applications to include the experiments used to validate the models.

Ethereal Mechanics: Cosmology [EM05] follows next which develops that large scale Ether model and applies it to Black Holes, Planetary Precession, Stellar Aberration, and Galactic Behaviors without the need for Dark Matter.

Appendix A. Abbreviations

EM	Ethereal Mechanics
NE	New Electromagnetism
NE3,NEV3	New Electromagnetism Version 3
NE5,NEV5	New Electromagnetism Version 5
VA	Vortrix Algebra
LVA	Legacy Vector Algebra
CE	Classical Electromagnetism (Electrodynamics)
SSE	Small Scale Ether Model
LSE	Large Scale Ether Model
AE	Advanced Ether Model
SSG	Small Scale Gravity
NEP	New Energy Paradigm
ROA	Rules of Scientific Acquisition
TOE	Theory of Everything
ACOR	Arbitrary Constant of Relation
GR	General Relativity
QM	Quantum Mechanics

Appendix B. Definitions

Up The Rabbit Hole Down the Rabbit Hole	Down the Rabbit hole is a euphemism that refers to going to the deeper constructs that comprise the present context. For example, if one were looking at a JPG image, then going down the rabbit hole would be to look at the compression algorithm or even consider the format of the image at the binary level. This expression was made popular by the movie "The Matrix" and it is a reference to Lewis Carol's "Alice in Wonderland" Up The Rabbit Hole is the opposite.
Preton	Intertialess charge particle (formerly MCP massless charged particle)
Transvariance	Variations in natural processes occurring as the result of a body translating with respect to the medium (see [EM01]). These variations allow experimental results to yield the same answer regardless of the experimental velocity relative to the medium (e.g. Michelson Morley). These variations include length contraction, changes in reflection and refraction, changes in field emission geometries, process dilation (formerly called time dilation) and others. This is the first paper of Ethereal Mechanics and it supersedes Special Relativity.
Natural Units	Physical units represented without arbitrary constants of relation (ACOR). These allow the structure of the underlying physical systems to express themselves. This is the subject of the second Ethereal Mechanics Paper [EM02]
Vortrix Algebra (VA)	Vortrix Algebra is an improved Vector algebra that provided a more complete multiply (product) and the first ever vector quotient. Vortrix Algebra is defined for System of 1 dimension (Arithmetic), 2 dimensions supersedes complex algebra without the need for an imaginary operator and 3 dimensional systems. VA is capable of systems of any number of dimensions; however, the complexity grows by an order of magnitude for each additional dimension.
Rules of Acquisition	The Rules of Scientific Acquisition are a series of aphorisms that guide scientific thinking. There are Tells that allow better fidelity in knowing whether a model or theory is hiding something more fundamental. There are Rules and Imperatives to ensure more a more complete scientific examination of natural phenomenon. There are Traps (Mind Traps) and Fallacies to expose flaws in human thinking and behavior that impair scientific progress.

Appendix C. References

[EM01] Transvariance. The first Ethereal Mechanics paper Ver 1.2, 25 Dec 2018
https://www.distinti.com/docs/EM_01_Transvariance_ver1_2.pdf

[EM02] Constructs. The Second Ethereal Mechanics paper Ver 3.1, 21 Sep 2021
https://www.distinti.com/docs/EM_02_Constructs_V3p1.pdf

[VA] Vortrix Algebra Ver 1.3. More complete vector algebra that includes proper product and quotient
https://www.distinti.com/va.html

[ROA] Rules of Scientific Acquisition
https://www.distinti.com/roa.html

[EM03] Electrogravity Home Page
https://www.distinti.com/eg.html

[EM04,NEV5] New Electromagnetism V5 (Future Release)
https://www.distinti.com/ne5.html ← Posted here when release

[EM05] Cosmology The fifth Ethereal Mechanics Paper (Future release before end of 2023)
https://www.distinti.com/cosmo.html ← Posted here when released – check for release date updates

[EM06, NEP] New Energy Paradigm – Continuation of Electrogravity
https://www.distinti.com/nep.html ← Posted here when released

[NE3, NEV3] New Electromagnetism V3 (obsolete except for New Induction)
https://www.distinti.com/ne.html

[FOUND] The Foundation Video Series – the development of New Induction and New Gravity
https://www.distinti.com/fs.html

[THESIS] Graduate Thesis using New Induction
https://www.distinti.com/docs/neThesis.pdf

[NG] New Gravity paper. Distinti 1999 (revised 2004)
https://www.distinti.com/docs/ng.pdf

[T19] Magnetism is the cause of time dilation???
https://www.youtube.com/watch?v=zrGuFcoPCxQ

[T1] 500c or Die – We must break the light barrier by a factor of 500 or face extinction
https://www.youtube.com/watch?v=HS-gkF2nQio

[T13] Prior Art Review
https://www.youtube.com/watch?v=M8OR7LqUpio

[https://www.youtube.com/watch?v=_LWXeFIT-4g] Transvariance Simulation Video

[https://www.patreon.com/posts/22830195] Transvariance Simulation Executable (Win7 and above)

[https://www.youtube.com/watch?v=vBgdiAij1gA] Derivation of Transvariant Steering

Appendix D. Revision History

Rev 0.5 Initial Draft for Patreon Review

Rev (Ver)	
0.5 8 May 2022	Initial Draft (Registered with copyright office). For Patreon Review
1.0 15 July 2022	Fixed Grammar/Spelling Mistakes Corrected Gravity Derivation, (r_p off by a factor of 2) Spun off Energy Discussion into New Energy Paradigm Paper (not complete) Added Appendix D, Revision History Updated References, Definitions, Abbreviations Added Section 6 ,Faster Than Light