

The Unified Field

Joseph H. (Cass) Forrington 

Managing Editor, Journal of Cosmology, California, USA

Email: captcass@captcass.com

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Abstract

This is a Unified Field description based on the holographic Time Dilation Cosmology, TDC, model, which is an eternal continuum evolving forward in the forward direction of time, at the speed of light, c , at an invariant 1/s rate of time. This is the Fundamental Direction of Evolution, FDE. There is also an evolution down time dilation gradients, the Gravitational Direction of Evolution, GDE. These evolutions are gravity, which is the evolutionary force in time. Gravitational velocities are compensation for the difference in the rate of time, dRt , in a dilation field, and the \sqrt{dRt} is equal to the compensatory velocity's percentage of c , and is a measure of the force in time inducing the velocity. In applied force induced velocities, the dRt is a measure of the resistance in time to the induced velocity, which might be called "anti-gravity" or "negative gravity". The two effects keep the continuum uniformly evolving forward at c . It is demonstrated that gravity is already a part of the electromagnetic field equations in way of the dRt element contained in the TDC velocity formula. Einstein's energy formula is defined as a velocity formula and a modified version is used for charged elementary particle solutions. A time dilation-based derivation of the Lorentz force ties gravity directly to the electromagnetic field proving the unified field of gravity and the EMF. It is noted how we could possibly create gravity drives. This is followed by a discussion of black holes, proving supermassive objects, like massive black hole singularities, are impossible, and that black holes are massless Magnetospheric Eternally Collapsing Objects (MECOs) that are vortices in spacetime.

Keywords

Unified Field, Gravity, Anti-Gravity, Astrophysics, Einstein, General Relativity, Special Relativity, Galactic Rotation Velocities, Time Dilation, Spacetime, Space, Time, Spacetime Continuum, Quantum Continuum, MECO, Black Hole, Event Horizon, Timelike, Spacelike, Lightlike

1. Introduction

This is the fourth paper in a series on Time Dilation Cosmology, TDC. TDC is an eternal holographic model of the universe based on time dilation. The reader should not expect it to be part of the Lambda/CDM/Big Bang, General Relativity, fixed space models. It is a spacetime/quantum continuum evolving forward at the speed of light, c , in the forward direction of time. It is a universe of light, not rock. It is strongly suggested the first-time reader refer to the author's previous papers to clarify concepts when necessary.

In the TDC model, there are two forward directions of evolution, the Fundamental Direction of Evolution, FDE, which is in the forward direction of time, and the Gravitational Direction of Evolution, GDE, which is the evolution down time dilation gradients due to differences in the rate of time. Time is the force behind these evolutions and that force is gravity; the irresistible evolutionary force of time.

In the author's previous three TDC papers [1] [2] [3], it was demonstrated that all gravitationally induced velocities are compensation for the apparent difference in the rates of time, " dRt ", due to mass/energy densities, so the uniform evolution of the continuum at c is maintained.

In this paper, it is shown how, in velocities induced by the application of an outside force, including in the Electromagnetic Field, EMF, the obverse is true and the slower rate of time is compensation for the velocity, so no part of the continuum can evolve ahead of the whole, and the dRt is a measure of the resistance in time to the induced velocity, which might be called "anti-gravity" or "negative gravity". In the one, the dRt manifests the velocity, and in the other, the externally induced velocity manifests the dRt . The speed of light is not just the maximum speed limit, it is also the minimum speed limit. It is *the* speed of the continuum overall. The velocities induced by gravity and the time dilation manifested by velocities that are induced through the application of an external force, keep the continuum evolving forward uniformly at c .

Because of our subjective view of the universe, we have always considered it to be made up of separate objects moving through a pre-existing fixed space. Quantum physics has now allowed us to consider it to be a quantum continuum, where "particles", and the objects they comprise, are actually continuously evolving waveforms in the quantum continuum, neither a particle nor wave, that only exist in a state of superposition until they are actually observed, and can even be in two places at the same time.

Astrophysics has been plagued with conundrums for over 100 years because it has not been adapted to this model, primarily due to a misinterpretation of what manifests the Hubble shift, which the holographic Time Dilation Cosmology model now does [1].

Space and time are not two different things, but merely two aspects of a single thing, "spacetime". That being said, if something can be explained in spatial terms, it can also be explained in terms of time, which is what the TDC model

does. In the TDC model, spacetime is the quantum continuum, a 3D holographic energy field evolving forward at c in the forward direction of time.

Traditionally, we have considered events in space to be evolving forward “over time”. In the TDC model we see that it is, rather, that time is evolving spatial events forward. This makes time the fundamental, irresistible, force in the universe. If time slows, the frequency of photons slows and energy, which is dependent on frequency, decreases. If time appears to stop, we see frequencies, and all motion, reduce to zero and there is no energy. As the rate of time increases, the frequency of photons and the velocities of mass densities increase and energy increases.

Section 2 provides a brief overview of basic concepts for the first-time reader. Please refer to the referenced previous papers for more detail as necessary.

In **Section 3** of this paper, there is a dilation-based derivation for the Lorentz force, combining gravity with the EMF, proving the EMF is dependent on gravity. It is also shown how to add the energy for a charged elementary particle to Einstein’s energy formula to obtain solutions for them. This also combines gravity and the force in the EMF in one formula through the dRt element.

That is followed in **Section 4** by proof supermassive objects like black holes, can’t exist, and demonstrates how they are actually massless spacetime vortices.

The TDC model resolves all the major conundrums in astrophysics, and ties astrophysics directly to quantum physics. Together, the TDC papers have thousands of views by professors worldwide and the viewing and download patterns indicate that the model is now being presented to astrophysics and/or quantum physics students in at least 7 universities.

2. Basic Concepts

In this model, Einstein’s energy formula (48) is a velocity formula. The c element is the velocity of the evolving continuum and the v element is the compensatory velocity due to time dilation. It is the force in time accelerating energy masses forward at c/s^2 and that is the fundamental energy of the continuum. The mass’ velocity component, $\sqrt{1+v^2/c^2}$, that scales mc^2 in the equation, does not increase the mass, but the c velocity element, thus increasing the energy by increasing momentum. If we could, when we got to a velocity of c , as we do with photons, the difference in the rate of time, $dRt = 1$ and the total energy = $mc^2\sqrt{2}$, not an infinite mass as some profess. The $\sqrt{2}$ is significant as it showed up as the spatial acceleration factor within the original dRt velocity formula derivation [1].

The velocity component is the energy spent by time inducing the compensatory velocity required by the dRt . The velocity’s percentage of c , equals the \sqrt{dRt} . Thus, the square root of the dRt element determines the force in time in equations with a velocity element, whatever they are.

It is important to note that the velocity’s percentage of c is ALSO the \sqrt{dRt} . A velocity of $0.25c$ is a \sqrt{dRt} of 0.25. This cannot be merely a coincidence.

When we increase the velocity of a mass through the application of an outside force, as in the EMF, the apparent rate of time must drop so the particle does not get ahead of the continuum. In gravity, the velocities are compensation for the dRt and in the EMF, and in any other velocity induced through the application of an outside force, the dRt determines the resistance in time that compensates for the velocities. The force in time is the same for both, but in one it is dragging densities forward, and in the other, it is holding densities back. In both cases, time is manifesting a drag. This drag on space keeps the continuum evolving forward at a single velocity, c , at the invariant 1 s/s rate of time of the universe as a whole.

When we consider the heliosphere's (Sun's) velocity relative to the Cosmic Microwave Background Radiation, CMBR, the planets' orbits form spirals and we find that the velocities equalize to that of the Sun's. This is clearly demonstrated in the **Appendix** even though the results are not exact since the inclination of the ecliptic and the fact the orbits are elliptical and not circular were not even taken into consideration. Differences in velocities are illusional relative effects. The continuum is evolving uniformly at c .

In this paper, it is shown how the dRt is the key to equating the various forces in gravity and the EMF where:

$$dRt = 1 - \sqrt{1 - \frac{2GM}{rc^2}} = \frac{E}{mc^2} - 1 = \frac{Fr}{mc^2} = \frac{F}{qc} = \left(\frac{F}{Bc} - \frac{E}{Bc} \right)^2 \quad (1)$$

And, where F_{total} is the total EMF force and F_T is the force in time, when the forces are equal, so are the velocities and dRt ;

$$F_{total} = N * \left(k * \frac{q^2}{r^2} \right) = F_T = c^2 (dRt) \quad (2)$$

Gravity, which is the evolutionary force in time, is measured by the dRt and has always been in our EMF formulas in the dRt velocity element. Unlike the velocity element, which is not a force, the dRt determines the force in time, F_T , in Newtons. The dRt manifests a force in Newtons that induces a velocity of $c\sqrt{dRt}$.

2.1. The Continuum

Because the holographic spacetime continuum has three spatial dimensions, we see all the distances and angles we are used to within it. But because the holographic field is evolving forward in the forward direction of time at c , and time has no depth, the holographic field, itself, has no depth.

This changes our perspective from the classical view of individual objects moving through a fixed space, to densities evolving forward within the evolving spacetime/quantum continuum. A proof of this dynamic is that when we sent the IBEX satellite to the leading edge of the heliopause to measure the shock wave generated by the heliosphere's 231 Km/s velocity "through space", no shock wave was detected. The "dead zone" discovered by Voyager 1 beyond the

heliopause, where we expected to find high interstellar winds, also confirms this model.

All masses and energy fields are therefore spatial densities within the fabric of the continuum. These densities are more difficult for time to evolve forward than thinner, “empty”, space and we see the rate of evolution and, therefore, also time, appear to slow. This is time dilation.

As the continuum cannot have different parts evolving forward at different rates without it stretching out over time, the slower rates are compensated for through velocities.

In all gravitational cases the velocity is a function of the dRt manifested by energy (mass) densities and the following velocity formulas, as derived in “General Relativity: Effects in Time as Causation” [1] and “Time Dilation Cosmology” [2], apply. It should be noted that all the time dilation factors for the gravitational velocities in those papers were derived using the standard time dilation factor formula, as were the velocity formulas. As that is so, the velocity formulas are used to derive the dRt in other formulas. This demonstrates how the dRt is what is important in the formulas, not the velocities, which are merely compensation for the dRt in gravity and the reason for the dRt in external force induced velocities. Solutions are provided for all the equations [1] [2] [3], proving them.

2.2. dRt Velocity Formulas

The time dilation formula for gravitational velocities for nearly circular orbits, first derived in “General Relativity: Effects in Time as Causation” [1], is:

$$v = c\sqrt{1 - T_o} \quad (3)$$

where c is the speed of light and T_o is the greatest time dilation factor for the coordinate point. This term is then used to replace the velocity element in numerous physics formulas. Furthermore, where a Kepler Zone is an area within a dilation field where Kepler’s laws and General Relativity, GR, work to determine the orbital velocities, it is demonstrated that when the solution is divided by the $\sqrt{3}$,

$$v = (c\sqrt{1 - T_o})/\sqrt{3} \quad (4)$$

we get the anomalous velocities of stars outside the Kepler Zone of large spiral galaxies, beyond the corotation ring, where Kepler’s laws and General Relativity fail to derive the velocities, eliminating the need for Cold Dark Matter.

In the author’s second paper, “Time Dilation Cosmology” [2], published in the *Journal of Modern Physics* in 2023, this formula is further reduced to:

$$v = c\sqrt{dRt} \quad (5)$$

where “ dRt ” equals $(1 - T_o)$, and is the difference in the rate of time between the invariant 1 s/s rate of time of the universe as a whole and the coordinate point, and solutions are provided for the other time dilation-based formulas, where it is used to replace the velocity element, a summation of which is in **Section 5** of

this paper. These formulas clearly indicate that all gravitationally induced velocities are merely compensation for the apparently slower rates of time due to masses in a holographic spacetime continuum evolving forward in the forward direction of time at c .

As we now have the dRt , which is responsible for gravity, in those formulas, we can compute the force in time in Newtons within those formulas and see how gravity, and resistance to force-induced velocities, (perhaps we could call that “anti-gravity” or “negative gravity”), is at work within all those equations instead of the velocity element.

These formulas nearly eliminate the need for G , the gravitational constant, an empirically derived number that makes our Newtonian equations work, including Einstein’s field equations. It has no other meaning or reason to exist. It, too, is expressed in terms of the dRt in **Section 5**, and that derivation is used in deriving the dRt version of Einstein’s gravitational constant in his stress-energy tensor in “Time Dilation Cosmology 2” [3].

3. The Unified Field

In the TDC model, spacetime is a continuum. There are no separate parts, just different aspects and spatial mass/energy densities. The assumption that space is empty is wrong. Space is filled with the Cosmic Microwave Background Radiation, CMBR, nearly uniformly, everywhere. Since the CMBR is energy, and energy equals mass, space is filled with mass, which gives it inertia. There is also an accompanying magnetic field of near equal intensity everywhere.

Within classical and quantum physics, a photon is considered massless and the energy is attributed solely to its momentum, which gives it relativistic mass. Whether a photon has a rest mass is still considered a possibility, though that would create problems for quantum mechanics models. In the TDC model, regardless of the rest mass issue, it is still a density, a waveform, within the continuum and contributes to the inertial mass of space. In the TDC model, gravitational lensing is not due to the photons transiting a curved space, but by photons evolving down the time dilation gradient as the photons pass through the dilation field, as the continuum simultaneously evolves forward, like any other particle [1].

A photon’s relativistic mass can be derived by converting its energy to Joules and is in the 10^{-36} Kg scale.

This is normally derived using Einstein’s basic energy formula for a particle at rest with the relative mass replacing the rest mass:

Using a photon of green light with an energy of (3.54×10^{-19}) J,

$$E = m_{rel}c^2$$

$$m_{rel} = E/c^2 = \frac{3.54 \times 10^{-19}}{299792458^2} = 3.938781198 \times 10^{-36} \text{ kg} \quad (6)$$

However, when we use the full formula that includes the velocity, we find that, as the velocity of photons is c , $v^2/c^2 = dRt = 1$:

$$E = mc^2 \sqrt{1 + \frac{v^2}{c^2}} \tag{7}$$

$$E = mc^2 \sqrt{1 + dRt} \tag{8}$$

and,

$$m_{rel} = \frac{3.54 \times 10^{-19}}{\sqrt{2} \times 299792458^2} = 2.785138895 \times 10^{-36} \text{ kg} \tag{9}$$

As the $dRt = 1$, time appears to stop. It does not stop for the observer, but in the photon we see a frozen instant in time from the past. In effect, the photon is a frozen image in time. We are always seeing the past and only experience the present in our inertial frames because it takes light time to reach us.

Because of the acceleration in time within lifeforms that manifests the Hubble shift and allows plants to grow upwards against gravity, as per [1] [2] [3], the photon is time dilated and red shifted over distance. As per those papers, the acceleration effect is cumulative over time because life only comes from life and all lifeforms are just different points of view for that one life that occupies succeeding generations of lifeforms. This also explains non-locality, as per those papers. Thus, we are seeing older time *and* slower time.

3.1. The Mass of the CMBR

In “Time dilation Cosmology” [2], it is postulated that in an eternally evolving continuum, it is time’s $\sqrt{3}$ acceleration that puts stress on space, generating the CMBR, and the $\sqrt{2}$ spatial acceleration factor that appeared in the original velocity derivations [1].

As it is not time and space, but spacetime, we see that space appears inert, and has inertia, and time is the energetic component, evolving spatial events forward. Due to its inertia, space lags behind time. This is a similar lag in effect as in the EMF. Space reacts to time as the EMF reacts to a flow of energy.

Where space has a compensatory fundamental velocity of

$$v = c \times (\sqrt{3} - \sqrt{2}) = 299792.458 \times 0.317837245195 = 95285 \text{ km/s} \tag{10}$$

Using Einstein’s formula,

$$E = mc^2 \times \sqrt{1 + v^2/c^2} \tag{11}$$

the mass of 1 m³ of the CMBR is:

$$m = 4.17 \times 10^{-14} / (299792458^2 \times 1.0492952) = 4.42177 \times 10^{-31} \text{ kg} \tag{12}$$

Because 0.317837245195 is also the dRt between time and space, we can now also derive the mass using the formula for fundamental compensatory spatial velocities,

$$\frac{c\sqrt{dRt}}{\sqrt{3}} \tag{13}$$

$$\sqrt{3} - \sqrt{2} = 0.317837245195 \tag{14}$$

so,

$$V_{Go} = c\sqrt{dRt}/\sqrt{3} = 299792.458 \times \sqrt{0.317837245195}/\sqrt{3} = 97580 \text{ km/s} \quad (15)$$

$$m = 4.17 \times 10^{-14} / (299792458^2 \times 1.05163955) = 4.411921 \times 10^{-31} \text{ kg} \quad (16)$$

3.2. Gravity and the EMF

In the heliosphere we see microwave and other wavelengths' intensity increase with the time dilation gradient. This is a thickening of the mass in space. The time dilation increases and decreases relative to the square root of the inverse of r . The EMF changes with the inverse of the square of r . $\sqrt{1/r}$ vs $1/r^2$, so they can rarely equate. But they are both part of the continuum and in the continuum, c is always maintained. It is the dRt that determines that in our equations. It always balances the velocity to maintain c . The only way it can be doing that is if time, itself, is the force inducing the velocities in gravity, and compensating for the velocities induced through the application of force.

Thus, we find in the coulomb ball and electron derivations below, that when the force is equal in time and the EMF, the velocity and dRt are, too. This unites them in the continuum and this makes them similar in many respects, as we shall see below.

Velocity is used as a scaling factor in our formulas, but it is not a force. The dRt is also not a force. However, the dRt is a measure of the force in time, which is gravity. As the dRt is what appears in the formulas for the force in time, for simplicity, we will refer to it as though it is the force. Hence, we can combine gravity with the EMF as in what follows below.

For centripetal force & gravity:

$$F = mc^2 (dRt)/r \quad (17)$$

But this is for within the dilation gradient in the Gravitational Direction of Evolution, GDE, not the Fundamental Direction of Evolution, FDE, in the forward direction of time, which is in the forward direction of the evolution of events, *i.e.*, as in an orbit.

As the constant velocity of the continuum is c , the fundamental force in time is a constant force manifested by an acceleration of $299792.458 \text{ km/s}^2$. Hence, we have c^2 , the velocity squared, in Einstein's energy formula. It imparts a velocity of $c\sqrt{dRt}$ for density-induced time dilated coordinate points to keep them up to the continuum. Because there is a constant acceleration in time, the induced velocities are also accelerations in the FDE. The Earth's 29.78 km/s velocity is actually a 29.78 km/s^2 acceleration.

Just as, in a stable orbit, the acceleration due to gravity in the GDE manifests as a velocity down the dilation gradient perpendicular to the FDE, the accelerations in the FDE also manifest as the velocities in the FDE.

Therefore, just as we consider the force in the GDE to be in Newtons, we can also do that with the force in the FDE as the dRt is a function of mass.

As there is no r in the FDE, and the force is not dependent on mass, but solely

the dRt , which is manifested by mass, the formula becomes:

$$F_T = c^2 (dRt) = \text{Newtons} \tag{18}$$

And,

$$v = \sqrt{F_T} \tag{19}$$

If there is no mass, there is no dRt and no force and velocity.

As the Lorentz force formula gives us N/C , when we use $1\ C$, we get the F/C in N .

$$F = q(E + v \times B) = E + vB = E + c\sqrt{dRt}B \tag{20}$$

and:

$$dRt = (F/Bc - E/Bc)^2 = (F/Bc)^2 - 2FE/(Bc)^2 + (E/Bc)^2 \tag{21}$$

and:

$$dRt = v^2/c^2 \tag{22}$$

so,

$$\sqrt{dRt} = \frac{v}{c} = F/qBc - E/Bc \tag{23}$$

Because the force in the EMF must modulate to account for the dRt , q , E & B , it is not possible to generally equate it to the standard gravitational force formula, which is specific only to G , m & r . However, as the dRt , which is derived from the time dilation formula which contains G , m & r , is a measure of the force in time, and the force in time is gravity, gravity is already within the EMF formulas in the form of the velocity. So, gravity and the EMF do share a common determinant in the dRt , as the dRt is specific to the velocity and vice-versa. The charge in the EMF relates to the mass in gravity and the velocity in the EMF can be changed by altering the EMF components, like changing the dilation gradient changes the velocity in the FDE. Traditional gravity formulas also apply to the EMF, though it is rarely taken into consideration because the GDE influence on that scale is so small.

The dRt ensures the rate of evolution of the continuum is inviolate.

From [4]:

“Space plasma physics often requires that dynamics be analyzed in terms of both the motion of individual particle and in terms of macroscopic moments such as temperature T , density n , and pressure P . Individual particle motion is based on considering the force $\mathbf{F} = q(\mathbf{E} + \mathbf{v} \times \mathbf{B})$ acting on a particle of charge q , mass m , and moving with a velocity \mathbf{v} in an electric field \mathbf{E} and magnetic field \mathbf{B} . Particle motion is generally separated into components, v_{\parallel} parallel to \mathbf{B} and v_{\perp} , perpendicular to \mathbf{B} . With $\mathbf{E} = 0$ and a uniform, time-independent magnetic field, v_{\parallel} is a constant and v_{\perp} is circular motion about \mathbf{B} with a frequency qB/m , which is referred to as the gyrofrequency, and radius mv_{\perp}/qB , which is referred to as the gyroradius. The direction of gyration is right (left)-handed with respect to the direction of \mathbf{B} for electrons (positive ions) as illustrated in

Figure 1. Except very near current sheets, particle gyroradii are generally very much less than the scale length for field and plasma variations in space plasmas. Also, particle gyroperiods are generally very much less than space plasma time scales for transport and for changes in plasma and field properties.” [4]

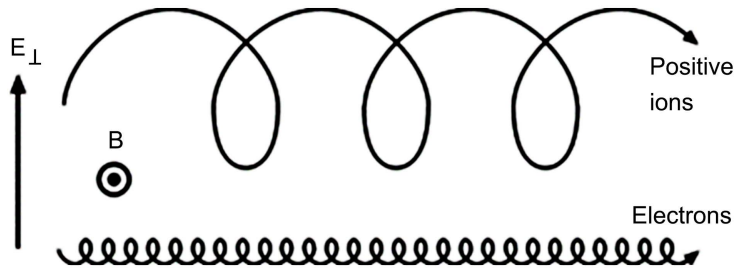


Figure 1. Particle gyrations.

$v_{||}$ relates to the Fundamental Direction of Evolution, FDE, velocity in the Earth’s orbit derivation below, where the FDE is the forward direction of time. The velocity vector tangent to the orbit is the FDE. Velocities are induced in the FDE by gravity.

v_{\perp} relates to the Gravitational Direction of Evolution, GDE, velocity in the Earth’s orbit derivation below, where the GDE is the evolution down time dilation gradients, perpendicular to the FDE, which is traditional gravity.

In “Time Dilation Cosmology” [2], we provide the following time dilation-based formula for the Earth’s orbital gravitational acceleration:

Earth’s Orbital Gravitational Acceleration:

$$ac = \frac{v^2}{r} = 29780^2 / (1.49598262 \times 10^{11}) = 0.005928 \text{ m/s}^2 \quad (24)$$

$$ac = \frac{c^2 (dRt)}{r} = 299792458^2 \times 9.070951 \times 10^{-9} / (1.49598262 \times 10^{11}) = 0.005930 \text{ m/s}^2 \quad (25)$$

We can now demonstrate how the orbital curvature manifests as the continuum evolves forward, without curved space.

The curvature is the resultant of the two dRt -induced velocities: the average orbital velocity, 29,780 m/s for the Earth, and the gravitational acceleration, which manifests as a velocity in a stable orbit, 0.005930 m/s.

$$\text{Tan}\theta = \frac{0.005930}{29780} = 0.0000001991269308 \quad (26)$$

$$a\text{Tan}\theta = 0.0000114091330^\circ \quad (27)$$

and there are 3.154×10^7 s/year, so,

$$0.0000114091330^\circ \times 3.154 \times 10^7 = 359.84^\circ \quad (28)$$

Of course, we do not get 360° because we are using average velocities, the Earth’s orbit is elliptical, not circular, and is influenced by the orbits of the other planets.

As noted in **Section 2**, the planets' orbits are actually spirals because the Sun is evolving (rotating) around the galaxy. This is similar to the spins of charged particles around a conductor that spiral forward with the current as in **Figure 1**. In gravity, they are spiraling forward in the forward direction of time, of the evolution of events. This is also what is happening in the EMF, where the $v \parallel$ current flow is in the FDE. The velocity vector of all particles is in the FDE and the FDE curves due to the GDE in gravity and the $v \perp$ element in the EMF.

Thus, the orbital curvature is the resultant of the FDE and GDE velocities as the GDE bends the FDE into a curve and we find this same perpendicular velocity relationship in the Lorentz force. Hence, we see curvatures in the forward direction of time, the FDE, throughout the universe: spirals and rotations on all scales; vortices in spacetime.

As nearly all elementary particles are within a Kepler zone,

$$v = c\sqrt{dRt} \tag{29}$$

So,

$$dRt \parallel = v \parallel^2 / c^2 \tag{30}$$

$$dRt \perp = v \perp^2 / c^2 \tag{31}$$

$$v^2 / c^2 = dRt \tag{32}$$

Continuing to replace v with $c\sqrt{dRt}$, we find the following:

$$F = q(E + v \times B) = qE + Bqc\sqrt{dRt} \tag{33}$$

$$q = F / (E + Bc\sqrt{dRt}) \tag{34}$$

$$F/q = E + Bc\sqrt{dRt} \tag{35}$$

$$\sqrt{dRt} = F/Bcq - E/Bc \tag{36}$$

$$B = (F/q - E) / (c\sqrt{dRt}) = F / (qc\sqrt{dRt}) - E / (c\sqrt{dRt}) \tag{37}$$

$$\begin{aligned} Bq &= \left(F / (qc\sqrt{dRt}) - E / (c\sqrt{dRt}) \right) * F / (E + Bc\sqrt{dRt}) \\ &= F^2 / (Eqc\sqrt{dRt} + Bqc^2 dRt) - FE / (Ec\sqrt{dRt} + Bc^2 dRt) \end{aligned} \tag{38}$$

Gyroradius=

$$\begin{aligned} mv \perp / qB &= mc\sqrt{dRt} \perp / qB \\ &= mc\sqrt{dRt} \perp / F^2 / (Eqc\sqrt{dRt} + Bqc^2 dRt) - FE / (Ec\sqrt{dRt} + Bc^2 dRt) \end{aligned} \tag{39}$$

Orbital frequency=

$$qB/m = \left(F^2 / (Eqc\sqrt{dRt} + Bqc^2 dRt) - FE / (Ec\sqrt{dRt} + Bc^2 dRt) \right) / m \tag{40}$$

If the $dRt = 0$:

$$F = qE \tag{41}$$

$$B = \text{undefined}$$

$$q = F/E \tag{42}$$

So, when we replace the velocity with the gravitational force in time, we see how much deeper we can understand the force relationships in the EMF because the dRt , which manifests gravity, becomes a separate element in the equations.

Problem #3 from GeeksForGeeks.org [5]:

Find out the magnitude of the force experienced when a 5C charge is moving at 10 m/s under the influence of a 25 N/C electric field. The magnetic field of 10 magnitudes is perpendicular to the direction of the electric field and velocity. Find out the magnitude of the force experienced by the charge.

Answer:

The force on the charge is given by,

$$\begin{aligned}
 F &= qE + q(v \times B) \\
 \Rightarrow F &= 5 \times 25 + 5(10 \times 10 \times \sin(90)) \\
 \Rightarrow F &= 125 + 5 \times 100 \\
 \Rightarrow F &= 125 + 500 \\
 \Rightarrow F &= 625 \text{ N}
 \end{aligned} \tag{43}$$

Converting to TDC and the dRt :

$$\sqrt{dRt} = v/c = 10/299792458 = 3.33564095 \times 10^{-8} \tag{44}$$

$$\begin{aligned}
 F &= qE + q(c\sqrt{dRt} * B) \\
 &= 125 + 5(10 \times 299792458 \times 3.33564095 \times 10^{-8} \times 10 \sin 90) = 625 \text{ N}
 \end{aligned} \tag{45}$$

Returning to Equation (10):

$$\sqrt{dRt} = \frac{v}{c} = \frac{F}{qBc} - \frac{E}{Bc} = \frac{625}{5 \times 2997924580} - \frac{25}{2997924580} = 3.33564095 \times 10^{-8} \tag{46}$$

By solving for E , we find:

$$E = F - q(c\sqrt{dRt} * B) \tag{47}$$

As it is the electromagnetic energy, and not the field, that moves through space, the q velocity and B field simply grow and decline in a region of space in response to the flow of energy. The electric field reflects the condition of the electric energy flow in the previous, not present, moment. The latency is determined by the time required for the field to propagate from the conductor to the coordinate point under consideration. The greater the distance from the conductor, and the greater the dRt , the more the electric field lags.

3.3. Gravity and Charged Elementary Particles

Einstein's energy formula doesn't work for charged elementary particles because it doesn't take into account the particle's charge; the EMF component.

In Einstein's formula, we have a neutral particle moving through space. When we have a charged particle, we must also consider that it is also moving through the EMF. Since the velocity is the same in both space and the EMF, the dRt is the same in both and the force in time is the same in both. In gravity, the velocity

component is the energy expended inducing the velocity due to the gravitational time dilation, and in the EMF, it is the energy expended overcoming the resistance in the EMF to the gravitationally induced velocity, which is the same as the force in time necessary to compensate for the same velocity when induced by the EMF.

Therefore, to include the charge's contribution, we use the whole compensatory velocity element instead of just using the square root. The solutions to the following derivations prove this new formula, especially the electron computations that show the force in time, F_T , and the force in the EMF, F_{total} equalize at what is essentially the radius of the electron. (Note: The number of significant numbers in some of the following equations is left high for the sake of accuracy.)

Einstein's formula,

$$E = mc^2 \sqrt{1 + \frac{v^2}{c^2}} \tag{48}$$

becomes,

$$E = mc^2 \left(1 + \frac{v^2}{c^2} \right) \tag{49}$$

Therefore,

$$E = mc^2 (1 + dRt) \tag{50}$$

$$dRt = \frac{E}{mc^2} - 1 \tag{51}$$

As already demonstrated,

$$v = c\sqrt{dRt} \tag{52}$$

For an Electron:

$$dRt = \frac{1.602176634 \times 10^{-19}}{9.1093837 \times 10^{-31} \times 299792.458^2} - 1 = 0.9569511838961155 \tag{53}$$

$$\begin{aligned} E &= 9.1093837 \times 10^{-31} \times 299792.458^2 \times 1.9569511838961155 \\ &= 1.60217663472 \times 10^{-19} \text{ J} \end{aligned} \tag{54}$$

$$v = 299792.458 \times \sqrt{0.9569511838961155} = 293268.61958 \text{ km/s} \tag{55}$$

$$\sqrt{dRt} = 0.9782388174142935226c \tag{56}$$

If the charges and masses of the electrons in a Coulomb could be massed together, we would find this:

$$C = 6.241509 \times 10^{18} e \tag{57}$$

$$e = 1.60217663 \times 10^{-19} \text{ coulombs}$$

$$e \text{ mass} = 9.1093837 \times 10^{-31} \text{ kg}$$

$$\begin{aligned} &6.241509 \times 10^{18} / 1.60217663 \times 10^{-19} \\ &= 3.895643515908729738493314560455 \times 10^{37} \text{ electrons/C} \\ &= 3.5486911 \times 10^7 \text{ kg/C of mass} \end{aligned} \tag{58}$$

$$dRt = 6.241509 \times 10^{18} / (3.5486911 \times 10^7 \times 299792.458^2) - 1 \tag{59}$$

$$= 0.956951209055407478$$

$$E = 3.5486911 \times 10^7 \times 299792.458^2 \times 1.956951209055407478 \tag{60}$$

$$= 6.241509 \times 10^{18} \text{ J}$$

$$v = 299792.458 \times \sqrt{0.956951209055407478} = 293268.62343 \text{ km/s} \tag{61}$$

$$\sqrt{dRt} = 0.97823883027377699673c \tag{62}$$

where $E = 0$ and we set $B = 1$ to neutralize the effect of the magnetic field, the Lorentz force for 1 electron is:

$$F = qc\sqrt{dRt} \tag{63}$$

$$F = 1.602176634 \times 10^{-19} \times 299792458 \times \sqrt{0.9569511838961155} \tag{64}$$

$$= 4.6986812978234964 \times 10^{-11} \text{ N}$$

$$\sqrt{dRt} = \frac{v}{c} = \frac{F}{qc} = \frac{4.6986812978234964 \times 10^{-11}}{1.602176634 \times 10^{-19} \times 299792458} \tag{65}$$

$$= 0.9782388174142935203$$

The mass of the coulomb is there, but it is attenuated by the relativistic velocities of e and C . If there were no velocity, the spins and charges of the electrons would repel each other and gravity would be drawing them together and the two would balance where attraction equals repulsion, as follows.

The total magnitude of force in a sphere of 1C of electrons, where $N =$ the number of electrons and $k =$ Coulomb's constant $= 8.99 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$

$$F_{total} = N * \left(k * \frac{q^2}{r^2} \right) \tag{66}$$

$$F_{total} = 3.895643515908729738493314560455 \times 10^{37} \tag{67}$$

$$\times \left(8.90875 \times 10^9 \times (1.60217663472 \times 10^{-19})^2 \right) / 0.3218420481739$$

$$= 8.6006485492 \times 10^{10} \text{ N}$$

where,

$$r = 0.1035823039727 \text{ m.}$$

For the force of gravity that balances the force of the coulomb of electrons in the hypothetical sphere above, using the above derived dRt for a coulomb,

$$F_T = 299792.458^2 \times 0.956951209055407478 = 8.6006485493 \times 10^{10} \text{ N}$$

Therefore, in this instance, at this radius,

$$F_{total} = N \times \left(k \times \frac{q^2}{r^2} \right) = F_T = c^2 (dRt) \tag{68}$$

This also works for the electron:

Using the dRt from (53) for an electron, the force in time,

$$F_T = c^2 dRt = 299792.458^2 \times 0.9569511838961155 = 8.6006483232 \times 10^{10} \text{ N} \tag{69}$$

Using the total force equation we used for the coulomb, where r from the electron $= 5.1799389776 \times 10^{-23} \text{ m}$, which is only 1.84339×10^{-8} the radius of the

electron of 2.81×10^{-15} m, which is, in effect, the “surface” of the electron,

$$\begin{aligned}
 F_{total} &= N \times \left(k \times \frac{q^2}{r^2} \right) \\
 &= \left(1.60217663 \times 10^{-19} \right)^2 \times 8.99 \times 10^9 / \left(5.1799389776 \times 10^{-23} \right)^2 \quad (70) \\
 &= 8.6006483232 \times 10^{10} \text{ N}
 \end{aligned}$$

In the coulomb ball and electron derivations, note we get the relativistic velocities we would expect. Also note that there are no time elements used to derive the dRt , just the modified Einstein’s formula. Note that this is the same dRt we would get if we used rocket fuel to accelerate a particle, any particle, to those velocities. It is a relativistic illusion, but it is our reality from the classical physics point of view. When the $dRt = 1$, $v = c$, and time appears to stop at the coordinate point. However, it should be noted that no induced velocity can reach c for the observer. This is because the time dilation is changing with the velocity and the rate of time becomes so slow we stop seeing an evolution of events long before the velocity gets to c . For instance, consider when the dRt is 0.9999999999999999... etc.

Thus, we find in the coulomb ball and electron, that when the force is equal, the velocity and dRt are, too. This unites gravity and the EMF in the continuum.

Summarizing what is above, we find the following relationships to the dRt :

$$dRt = 1 - \sqrt{1 - \frac{2GM}{rc^2}} = \frac{E}{mc^2} - 1 = \frac{Fr}{mc^2} = \frac{F}{qc} = \left(\frac{F}{Bc} - \frac{E}{Bc} \right)^2 \quad (71)$$

This clearly demonstrates that the electromagnetic field, EMF, is scaled by the dRt . In gravity, we see the force of time acting directly to induce the velocities. In the EMF, we see the force in time compensating for the velocities. In the EMF, we can alter the direction of the FDE, which is the forward direction of time, and apparent velocity by the application of energy. If we can learn to manipulate the dRt independently, without changing the velocity, we should be able to develop gravity drives wherein we are evolving waveforms through the continuum down dilation gradients instead of forcing densities to shift through the application of force. Formula (21) indicates this is possible.

In the continuum, we see why c is not just the speed limit, but also the minimum speed. It is *the* speed. We also see that velocities are not random, and have a purpose, just as the resistance to velocities does in the EMF and other external force induced velocities in space. They keep the continuum together and evolving forward uniformly at a constant velocity, c .

The dRt is Einstein’s fixed space g_{tt} energy component properly applied to the evolving continuum, including to the EMF.

3.4. Particle Postulates

The CMBR is microwaves and microwaves have magnetic fields that oscillate. That oscillation causes polar molecules like water to spin and as soon as we see a dRt , we also get velocity and the spiraling motions in space and the CMBR.

When space spins, the CMBR spins and we get a charge. The author postulates that all particles have charge because all particles have spin. There are primarily two spins, the electron and up quark (the down quark being a combination of the two, which is why a down quark releases an electron, and, probably, a gamma ray, during beta decay), which are opposites and are attractive because their spins align along their near sides. This means they are evolving forward together in the FDE along that side. That common bond is the strong nuclear force. In the electron derivations above (69, 70), the spin is at the electron's "surface" where the $F_T = F_{total}$. Like spins impede on their near sides and repulse each other just as strongly as the shared spin bonds.

All molecular structures can be modeled with this 2-particle approach [6].

Aligning all the spins and charges in a ferrous material also aligns the charges and spins in the space surrounding the material through frame dragging. This is the magnetic field and we can see the spins in the magnetic lines in the surrounding space. Opposite poles of a magnet attract because they have opposite spins and charges. Like poles strongly repel.

These basic forces can then be seen to induce spirals at all levels.

4. Is It About Time? Black Hole vs. Spacetime Vortex

If it is about space, it is about time because it is "spacetime" and not space and time. If time were to stop, space would have to stop. That means all spatial events would have to stop. $F = 0$ and $E = 0$. If $E = 0$, $M = 0$ because mass is energy. This would be a void, not a mass. In spacetime, time is the energetic aspect as it is always evolving forward. Space is inert without time and has inertia. Rather than spatial events evolving forward "over time", it is time evolving spatial events forward. This makes time the fundamental force in the universe.

There are primarily 2 prominent models for black holes. The first and most prominent is that they are singularities, as in **Figure 2**, and the second is the Magnetospheric Eternally Collapsing Object, MECO, a rotating, Eddington limited, supermassive object with a magnetic field, **Figure 3**.

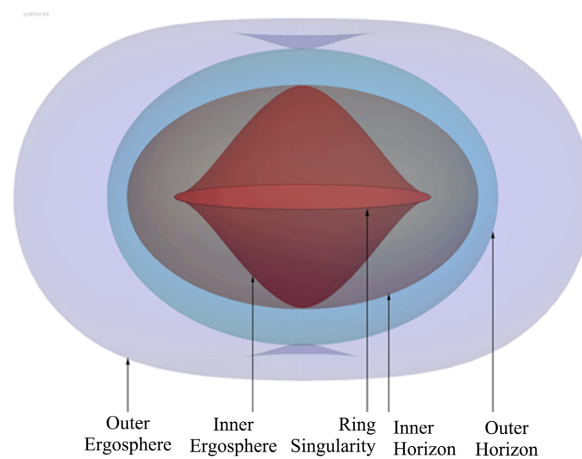


Figure 2. Singularity Black Hole.

At the ergospheres (shown here in violet for the outer and red for the inner one), the temporal metric coefficient g_{tt} becomes negative, *i.e.*, acts like a purely spatial metric component. Consequently, timelike or lightlike worldlines within this region must co-rotate with the inner mass. Cartesian projection, equatorial perspective [7].

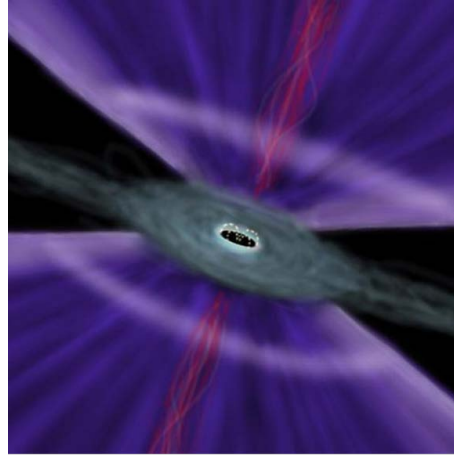


Figure 3. Magnetic Eternally Collapsing Object (MECO) (Image: Christine Pulliam/CfA).

Schematic figure demonstrating the principal luminous quasar structures as determined by our (Schild's team) reverberation-microlensing analysis. The dark compact central object is surrounded by dipole field lines (dotted yellow) and the sharp luminous ring at the inner edge of the accretion disc is white. A dark accretion disc intersects the outflow wind structures (Elvis surfaces) whose fluorescence above and below the plane (blue) contributes to the UV-optical continuum observed. The compact radio core (red) is shown in size and distance scaled to the overall structure. [8]

Both of these models have a supermassive object at the center, which is impossible.

The primary proof is that, as per [1] [2] [3], every mass dilates time and has to have a compensatory velocity to keep it up with the evolution of the continuum as a whole at c .

That velocity is proportional to the largest \sqrt{dRt} at the coordinate point: *i.e.*, the Sun's dilation factor is larger than any planet's at that coordinate point and that determines the velocity. So, too, with a planet and its moons.

As in **Section 3**, this is true of the smallest particles and it also has to apply to "supermassive" bodies. If the Milky Way's central MECO, Sagittarius A*, (Sgr A*), was ~ 4.3 million times the mass of the Sun, as currently estimated, and has a diameter of 23.5×10^6 Km, then its Mass = 8.5527×10^{36} Kg and its Radius = 11.75×10^6 Km.

If these figures were accurate, we would still have to use a radius of 12.702744×10^6 Km to even get a positive time dilation factor where $T_o = 0.000121$ and the $dRt = 0.999879$.

As the MECO's dilation factor would determine its own velocity, like stars

outside the Kepler Zone, its velocity formula is:

$$v = (c\sqrt{dRt})/\sqrt{3} = (299792.458 \times \sqrt{0.999879})/\sqrt{3} = 173074 \text{ km/s} \quad (72)$$

This unobservable velocity eliminates the possibility of there being such huge, supermassive, MECOs/Singularities.

When g_{tt} , Einstein's time dilation "energy components", goes to zero we are in the inertial frame. When it becomes negative, General Relativity, GR, ceases to work.

Without them, the math is senseless. GR describes what we see because of how light travels in a fixed, time dilated, space, as opposed to how it manifests in a continuum evolving forward at c . Hence it only works in a Kepler zone where the time dilation factors are all determined by the central object's dilation gradient. It does not work where the object's own dilation factor is determining its velocity or in a mass where we do not see light travel.

The singularity and supermassive object models violate Special Relativity, SR. As per SR, the duration of a second of time is equal everywhere in the universe, as is the length of a meter. There is no actual difference in rates of time, it is an illusion caused by spatial inertia and how light travels. Velocities are compensation for what "appear to be" slower rates of time. But *because* masses have velocities, the continuum as a whole is evolving forward at c at the invariant 1 s/s rate. Since both models include time dilation, all the way to the extreme time dilation where time appears to stop, and do not have the compensatory velocities, they violate SR. GR does not explain what is actually happening, just how it appears to be happening in a Kepler zone.

In **Figure 2**, as per the caption, if timelike or lightlike worldlines within the theoretical ergosphere must co-rotate with the "inner mass", the worldlines would appear frozen in time relative to the "fixed" ring singularity. Worldlines, including the singularity, are evolving forward at c because the continuum is evolving forward at c . But if time could stop at the singularity, and we see no compensatory velocity, what then? Does that part of the continuum cease to evolve forward? Of course not.

If time actually stopped, there would be no rotation of the mass in either the singularity or the massive body MECO. Any infall into a singularity would never reach it in the proposed 13.8 Gy lifetime of the universe, or perhaps ever in this eternal TDC model. In a dilation gradient, the rate of time just continues to drop and with such a massive object, it would get so slow worldlines would seem to be frozen in time long before they ever got there, just as, in **Section 3**, we see that a velocity of c can never be seen because the rate of time appears to slow so much as c is approached. At a rate of 1×10^{-9} s/s, for instance, it would take a billion years for 1 second to pass, a billion years for light to travel 1 Ls. A singularity would become impossible to reach as soon as it was formed. As the maximum accepted limit of a star is 300 solar masses, when and how did Sgr A* grow to 4.2 million solar masses? It didn't.

This explains why East and Yang [9], found the current sheet conundrum regarding the black hole horizon, as in their Discussion and Conclusion section:

“Here we have also quantified how much of the flux of energy and angular momentum coming from the jet is actually coming from the BH horizon, as opposed to being due to the current sheet that forms on the equator within the ergosphere. We have found that for rapidly spinning BHs, the latter contributes roughly as much as the former. This is counterintuitive as one typically thinks of current sheets as being the site of the dissipation of electromagnetic energy.”

In a spacetime vortex, this is exactly what we would find. In a high velocity vortex, the current sheet gets thinner and less able to contain the current the closer we get to the focus. Where the vortex velocity reaches c , we shift from timelike to spacelike and see a “black hole”, a void, and Schild and Leitner found empty space at the center of Q0957 in 2006 [10].

In the massive MECO model [5], the magnetic field is being manifested by a slowly rotating supermass, which is impossible due to the rate of time in such a mass. However, it would also be manifested by a spacetime vortex spinning at relativistic velocities. Within such a spacetime vortex, we see the expected relativistic velocities required by the time dilation.

When we look at the NASA photos of M87* and Sgr A*, **Figure 4**, we find ourselves looking into that vortex. In such a vortex, we are seeing the FDE at the focus. That is the forward direction of time, We can also see the gravitational direction downgradient in the GDE.

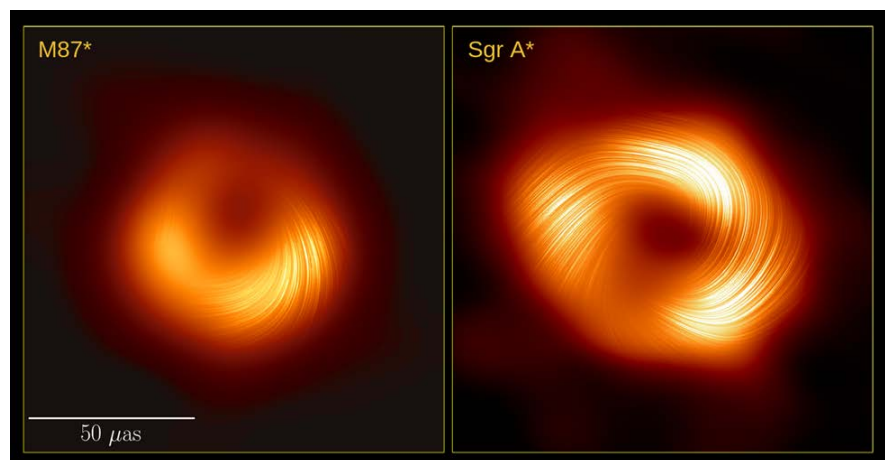


Figure 4. NASA—M87* and Sgr A*.

As we look into the vortices, we are seeing accelerating relativistic velocities because the continuum is evolving forward at c in the focus. This means we are “seeing” slower and slower time the closer we are to the focus so the “apparent” velocities, and frequencies, seem to decrease as we look deeper in. Just as outwardly we see red-shifted galaxies until they seem to be motionless and frozen in time at the cosmological horizon, we see relativistic velocities in a vortex appear to slow as time appears to slow due to the increasing relativistic velocities. It is a

Catch 22. We can never see a traveler reach an event horizon.

There is also an acceleration factor of $\sqrt{3}$ in the rate of time. This is universal, so relative relationships remain the same. The $\sqrt{3}$ turned up in “General Relativity: Effects in Time as Causation” [1] as a constant acceleration factor within time and this drives the vortex. This is the “Eternally Collapsing Object”. As in “Time Dilation Cosmology” [2], the $\sqrt{3}$ temporal acceleration manifests as the $\sqrt{2}$ spatial acceleration that appeared in the original derivation of the velocity formulas in [1].

A MECO appears to be a “black” hole as at the focus the FDE is always maintaining c under a continuous acceleration and the evolution of events, time, appears to stop so we can’t see anything, just empty space.

As the FDE vortex tightens and deepens, the GDE reaches relativistic velocities as it is frame dragged into the curvature of the vortex, which attenuates and breaks down the accretion disk mass densities into their constituent waveforms (particles). Frequencies are decreased as the attenuation increases and apparent energy decreases. The energy is conserved, however, as it is stored as stress in the highly attenuated space, which we see as the empty space within the MECO, and the electromagnetic field. When this energy can no longer be contained within the MECO, energy is emitted as luminescence and an electromagnetic beam and we see a quasar.

For the creation of a star, as per “General Relativity: Effects in Time as Causation” [1], when a spherical dilation pit forms, which could be as small as a standing wave in the Cosmic Microwave Background Radiation, CMBR, we have an area of low pressure. Slower time is lower pressure because frequencies are slower which means there is less energy. The space must also expand to maintain c , also lowering pressure. In the surrounding faster time, frequencies and energy are higher and space must constrict to maintain c . This increases pressure. We also see an evolution down the dilation gradient from faster to slower time as the next instant manifests first in the faster time. This is the Gravitational Direction of Evolution, GDE, which is traditional gravity. The GDE down time dilation gradients translates the force in time into kinetic energy.

When events impede at the focus of the pit, space is compressed and pressure increases and the kinetic energy is translated into thermal energy. This process increases until there is thermonuclear fusion in a star, and we get the heavy elements of the universe, which are expelled out into space.

As this system builds, it spins, as per **Section 3**. To reiterate, the motions we see are evolutions in the forward direction of time. What we see now, becomes that, whatever “that” is, later, and all orbits and rotations are spacetime spinning.

As we have frame dragging, we see each spin as a vortex and vortexes are turbulence. Thus, we see a turbulent spacetime everywhere, where the spiral galaxies are galactic hurricanes, as described in “Time Dilation Cosmology 2” [3].

For the creation of a MECO vortex, as we see galaxies nearly evenly distributed throughout the universe, the author postulates the MECO vortexes are

due to a wave interference phenomenon. When we have a large scale event, like galaxies colliding or a nova exploding, gravity waves, which are ripples in the rate of time, radiate across the universe. When two, or especially three or more of these waves intersect, they can form a massless vortex that is self-sustaining, just as a star is, due to the driving force of the $\sqrt{3}$ acceleration, building into a MECO.

In periods of high gravity wave generation, due to a high number of events, we would see a higher rate of MECO, and quasar, generation. This would explain why we see so many quasars about 10 Gy ago.

5. Summary

In **Sections 2 & 3**, we clearly demonstrated that motion in the electromagnetic field, EMF, is dependent on the dRt and that gravity is already in the EMF formulas as the dRt . As per the author's previous papers, [1] [2] [3], it is the only determinant in gravitational velocities. If there is no dRt , there is no motion. In the EMF, and in other velocities induced through an external force, we have shown that the force in time impedes the velocity so the particle does not evolve ahead of the continuum. Velocities are relativistic illusions in a continuum evolving forward uniformly at c at the invariant rate of time of 1 s/s of the universe as a whole.

We have now combined the EMF and gravity through the dRt by showing how it is a determinant in both and serving the same purpose in both as the determinant of the force in time regulating the rate of evolution of the continuum.

The dRt is Einstein's fixed space g_{tt} energy component properly applied to the evolving continuum, uniting gravity with the EMF.

In **Section 4**, we have shown how supermassive bodies are impossible due to what would be an excessive relativistic compensatory velocity, and problems with rotation and infall, while demonstrating how a spacetime vortex would explain what we are observing.

Note how, in the following formulas summary, the velocity formulas only have c and the dRt as factors and how in the formulas with mass, we now have them in terms of mc and mc^2 , as in Einstein's energy formula.

Formulas:

$$V_{Co} = c\sqrt{dRt} \quad \text{for simple, nearly circular, orbits within a Kepler Zone.} \quad (73)$$

$$V_{Eo} = \sqrt{2c^2(dRt) - c^2(dRt\alpha)} \quad \text{for elliptical orbits within a Kepler Zone.} \quad (74)$$

$$V_{Go} = c\sqrt{dRt}/\sqrt{3} \quad \text{for galactic rotation velocities for stars outside the Kepler Zone. This is the fundamental compensatory velocity formula.} \quad (75)$$

$$F_t = c^2 \times dRt \quad \text{for the force of time in Newtons in the FDE} \quad (76)$$

$$E = mc^2\sqrt{1 + dRt} \quad \text{for Einstein's energy formula.} \quad (77)$$

$$E = mc^2(1 + dRt) \quad \text{for charged elementary particles.} \quad (78)$$

$$F = (mc^2)(dRt)/r \quad \text{for centripetal force & gravity.} \quad (79)$$

$$F = \frac{(Mm)r_1c^2(dRt)}{M_\odot(r_2)^2} \text{ for the force in Newton's for 2-body systems.} \quad (80)$$

$$F = (Mm)R_Ec^2(dRt_E) / (M_\odot(RM)^2) \text{ for a 3-body solution for the force in Newton's for 2-body systems, in this case Earth, Moon and Sun.} \quad (81)$$

$$M_\odot = \frac{c^2(R-T_0)}{G} \text{ for the mass inside a stellar circle.} \quad (82)$$

$$G = rc^2(dRt) / M \text{ for the empirical gravitational constant.} \quad (83)$$

$$\frac{M}{R} = c^2 \left(1 - \left(1 - \frac{3 \times (V_{Go})^2}{c^2} \right)^2 \right) / 2G$$

for the Mass/Radius ratio of stars outside the Kepler Zone in spiral galaxies. (84)

$$H = \sum_i \frac{(m_i c^2)(dRt)}{2} + \sum_{i < j} (m_i c^2)(dRt)(r_i - r_j) \text{ for the Hamiltonian.} \quad (85)$$

$$u = c(\sqrt{dRt_v} + \sqrt{dRt_{u'}}) / (1 + \sqrt{dRt_v} \times \sqrt{dRt_{u'}})$$

for summing relativistic velocities. (86)

$$\gamma = \frac{1}{\sqrt{1-dRt}} = 1/\sqrt{T_0} \text{ for the Lorentz Factor.} \quad (87)$$

$$u = \|\vec{u}\| = \sqrt{c^2 dRt_x + c^2 dRt_y + c^2 dRt_z}$$

for the Euclidean norm of the 3d velocity vector. (88)

$$U = \gamma(c, \vec{u}) \text{ for the Four-Velocity.} \quad (89)$$

$$\frac{8\pi r(dRt)}{c^2 M} \text{ for Einstein's Gravitational Constant} \quad (90)$$

$$F = q(E + c\sqrt{dRt} \times B) \text{ For the Lorentz Force.} \quad (91)$$

6. Conclusions

The Time Dilation Cosmology model of the universe remains the only comprehensive model to date to replace what has now proven to be a failed Big Bang/ Λ CDM model that continuously fails to make accurate predictions about what our satellites like IBEX and Voyager 1, and our deep space telescopes like the James Webb, will find, and that is riddled with conundrums and improbable postulates such as the Big Bang, cold dark matter, dark energy and an infinitely accelerating expansion of the universe into an unknown, cold, dead, void. It also provides the only rational explanation for non-locality that is in accordance with the principle of superposition in quantum physics [3] and the only model to date to tie astrophysics directly to quantum physics and gravity to the electromagnetic field.

The TDC model describes an apparently eternal and infinite universe with no Big Bang origin or accelerating expansion. Proofs of this model are that when we sent the IBEX satellite to the leading edge of the heliopause to measure the shock

wave generated by the heliosphere's 231 Km/s velocity "through space", no shock wave was detected; the "dead zone" discovered by Voyager 1 beyond the heliopause, where we expected to find high interstellar winds; the James Webb space telescope's 2022 discovery of the new far distant galaxies, with a redshift of up to $z_{13.2}$, where most expected to find a "dark age" that would have followed the supposed Big Bang instead. This discovery by the James Webb was predicted by this author in all of his previous papers [1] [2] [3]. These observations, and the fact that an interferometer cannot distinguish between free fall and zero gravity [3], all confirm the TDC model.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix

Relative Velocities of the Planets from Different Perspectives

Since relative velocity changes with a change in perspective, the relative rate of time must, too.

Considering relative velocity and rates of evolution within the continuum, in the following computations:

Planetary orbital lengths and periods are as per NASA.

Orbital periods are related to 1 Earth year.

Orbital lengths are as perceived “around the Sun”.

Helical orbital lengths are computed using the following formula:

$$(\text{Distance travelled by the Sun})^2 + (\text{Orbital length})^2 = (\text{Helical length})^2$$

The distance travelled by the Sun is relative to the CMBR.

$$\text{Sun velocity} = 368 \text{ km/s} = 11.60672 * 10^9 \text{ km/yr.}$$

Considering the perspective of the orbits of Mercury and Venus relative to the plane of the ecliptic, we assign Mercury a velocity of 47.89 km/s and Venus one of 35.03 km/s, a large difference.

But if we consider the velocity of the Sun and its forward evolution in time relative to the CMB, and the helical distances travelled by the planets we get a much different perspective:

Mercury:

$$\text{Orbital length: } 57.909227 * 10^6 \text{ km}$$

$$\text{Orbital period} = 0.24 \text{ yr}$$

$$\text{Orbits/yr} = 4.1666$$

$$\text{Total orbital length} = 241.249839 * 10^6 \text{ km}$$

$$\text{Helical length} = 11.609226961 * 10^9 \text{ km}$$

$$\text{Velocity} = 368.07948 \text{ km/s vs } 47.89 \text{ km/s}$$

Venus:

$$\text{Orbital length: } 10.8209475 * 10^7 \text{ km}$$

$$\text{Orbital period} = 0.62 \text{ yr}$$

$$\text{Orbits/yr} = 1.6129$$

$$\text{Total orbital length} = 17.4531062 * 10^7 \text{ km}$$

$$\text{Helical length} = 11.608032143 * 10^9 \text{ km}$$

$$\text{Velocity} = 368.04160 \text{ km/s vs } 35.03 \text{ km/s}$$

Earth:

$$\text{Orbital length: } 14.9598262 * 10^7 \text{ km}$$

$$\text{Orbital period} = 1 \text{ yr}$$

$$\text{Orbits/yr} = 1$$

$$\text{Total orbital length} = 14.9598262 * 10^7 \text{ km}$$

$$\text{Helical length} = 11.607684041 * 10^9 \text{ km}$$

$$\text{Velocity} = 368.03056 \text{ km/s vs } 29.79$$

Mars:

$$\text{Orbital length: } 22.7943824 * 10^7 \text{ km}$$

$$\text{Orbital period} = 1.88 \text{ yr}$$

Orbits/yr = 0.5319
 Total orbital length = 121.2467148×10^6 km
 Helical length = 11.607353269×10^9 km
 Velocity = 368.02007 km/s vs 24.13

Jupiter:

Orbital length: 778.340821×10^6 km
 Orbital period = 11.86 yr
 Orbits/yr = 0.0843
 Total orbital length = 65.6273879×10^6 km
 Helical length = 11.606905535×10^9 km
 Velocity = 368.00588 km/s vs 13.06

Saturn:

Orbital length: 142.6666422×10^7 km
 Orbital period = 29.46 yr
 Orbits/yr = 0.0339
 Total orbital length = 484.27237×10^5 km
 Helical length = 11.606821027×10^9 km 12,576,482,920
 Velocity = 368.00320 km/s vs 9.64

Uranus:

Orbital length: 287.0658186×10^7 km
 Orbital period = 84.01 yr
 Orbits/yr = 0.0199
 Total orbital length = 341.70434×10^5 km
 Helical length = 11.606770299×10^9 km
 Velocity = 368.00159 km/s vs 6.81

Neptune

Orbital length: 449.8396441×10^7 km
 Orbital period = 164.8 yr
 Orbits/yr = 0.0060
 Total orbital length = 272.96094×10^5 km
 Helical length = 11.606752096×10^9 km
 Velocity = 368.00101 km/s vs 5.43

From this perspective, the velocities, or rate of evolution, of Mercury and Venus are only 0.038 km/s different. There would be no difference if the tilt of the ecliptic and the fact that the orbits are elliptical and not circular were taken into consideration. Note also that as we increase distance from the Sun, the velocities decrease until Neptune has a velocity only 0.001 km/s different from the base velocity of the Sun. Relative velocities equalize with a larger perspective. If we shift out to the local group and its apparent motion relative to the CMB of 627 km/s, the difference between the Sun and Neptune's velocity is only 0.00059 km/s.

In both perspectives, the velocity and acceleration are directly related to the dRt /distance so are higher in steeper gradients, and this higher apparent accele-

ration of events in slower time frames maintains their relative positions within the overall continuum as it evolves forward as viewed from both perspectives.

This means GR is describing the forward evolution of the continuum and the events occurring within it, rather than the evolution of events through pre-existing “curved spacetime”. It is not the masses that determine relative velocities and trajectories, but the dynamics and perspectives in time.