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# Economy of Time and Matter in a Universal Setting

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**Abstract:** Magnetic wavelets in a vacuum at the constant speed of light are shown as gravity force in the electromagnetic field. The speed of light is gravity forces of the magnetic field and the interaction of mass wavelets in the electro field are subjected to the gravity forces of the magnetic field. This report will show the economy of scale in graphic form on the relationship of time and matter as energy in a universal setting.

**Keywords:** Economics of Gravity, Time and Matter, Spacetime.

## 1. Introduction

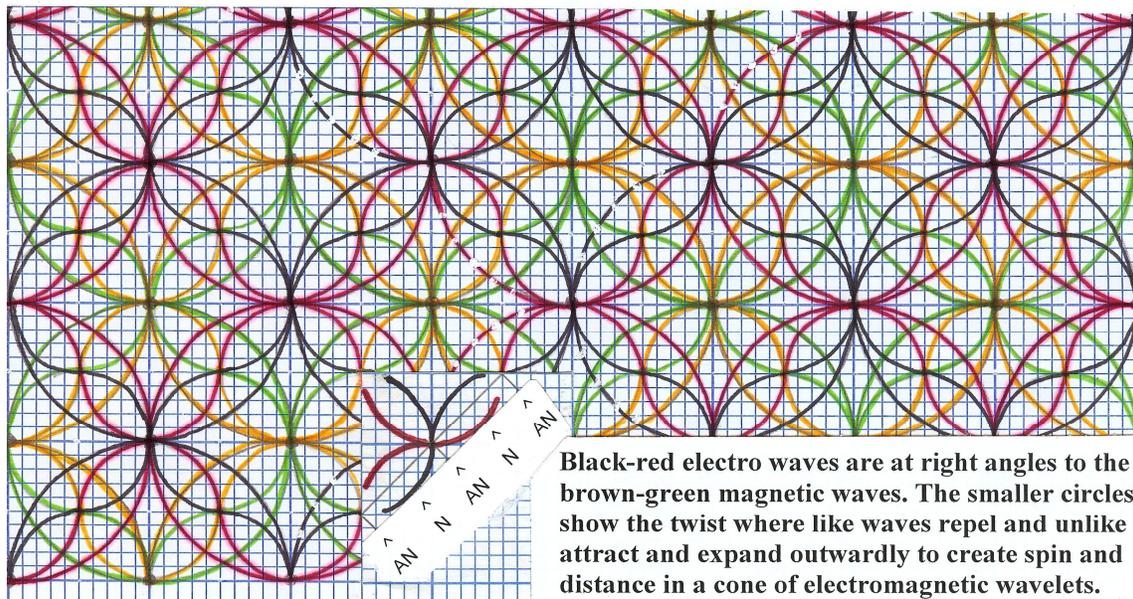
The electromagnetic field is comprised of standing wavelets in the opposite direction where direction is relative to the source of energy. The standing wavelets have electro and magnetic fields and the magnetic field provides the gravitational forces on the electro field. Gravity forces are very weak compared to the other forces of nature because while the other forces are at the antinodes in the electro field, gravity forces are at the nodes in the magnetic field. Gravity forces in the magnetic field effect mass in the electro field at the constant speed of light. Photons are standing wavelets packing a punch as a particle at the antinodes. Energy is equal to frequency of the wavelets based on Planck's constant,  $E = hv$ .

## 2. Report and Figures

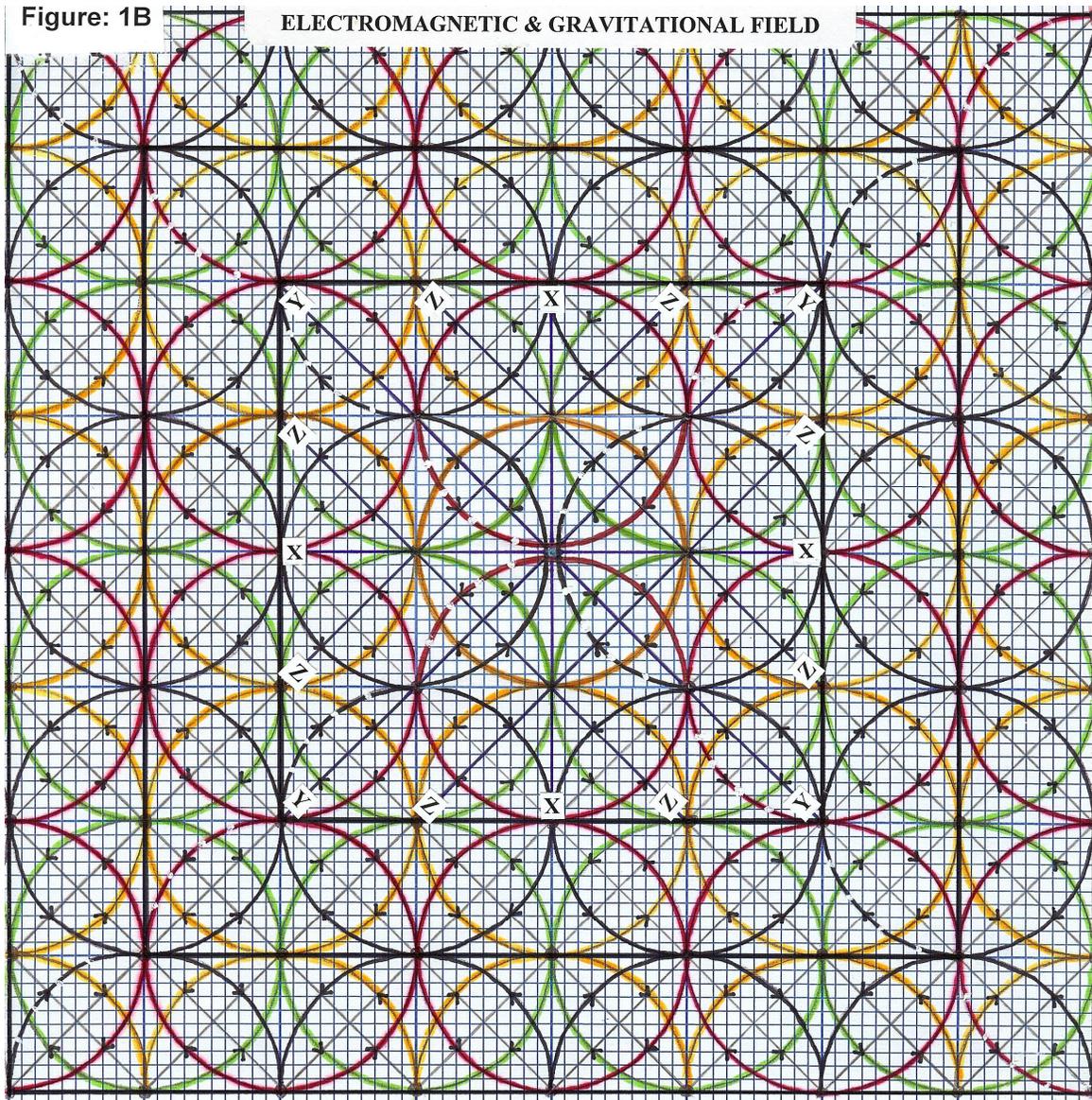
From the illustration Figure 1A below, energy is formed into half wavelengths at ultra high frequency standing waves. The black-red (dark) electro half waves become transverse waves because of the expansion process forming perpendicular to the brown-green (light) magnetic half waves. As the half waves multiply from energy displacement at the antinodes, the expansion of the transverse wavelets becomes three dimensional as a spiral resulting in an endless unit without a boundary. The half waves are open-ended where the antinodes are at the ends and nodes are in the middle such that each half wave keep multiplying indefinitely to complete whole wavelengths in the electromagnetic field. Each half wavelet is equivalent to two smaller half wavelets as a spiral within the wavelet to complete a whole wavelength where  $C = f \lambda$

Figure: 1A

ULTRA HIGH FREQUENCY WAVELETS



From the illustration Figure 1B below, energy propagates in the direction of the X axis in a three dimensional cone in space. The black-red electro wavelets are on the Y plane and are at right angles to the page. The brown-green magnetic wavelets are on the Z plane and are on the same plane as the page. This is likened to putting the palm of the right hand edgewise on the table with the thumb sticking up. Then place the left palm facing down between the fingers of the right hand with the thumb extended out. The thumb of each hand is the X axis for the electro and magnetic field. The double axis includes time plus three spatial dimensions in space-time that cannot be separate. Reversing the thumbs is given for every action there is an opposite and equal reaction. Electro and magnetic wavelets expand into larger wavelets from the antinodes (displacement) energy of standing waves at twice the amplitude of the smaller wavelet giving distance to the field. The cone waves need to be visualized as a spectrum of different size wavelengths increasing in size moving outwardly, not one size wavelength as shown. The multi source pattern from the wavelets is the electromagnetic wave spectrum.



Moving two steps from center in Figure 1B and squaring, there are four complete green (light) circles in the square. On three steps from center and squaring, there are nine complete brown (light) circles in the outer square and so on in the inverse square distance of the magnetic field. Moving diagonally from the center, the wavelets alternate between the electro and magnetic waves (Pythagorean Theorem from a triangle in the electro-magnetic wavelet circles). Holding the illustration up diagonally at eye level show how the transverse wavelets oscillate as finite energy in a vacuum where a change in electro field will cause a change in the magnetic field.

Gravity forces come from the brown-green magnetic waves inside the black-red electro waves Figure 1B (center) which are an inward attraction force at the nodes that conserve the energy. Gravity magnetic forces are at the nodes when the mass electro forces are firing at the antinodes. The electro is an outward expanding force from the source of energy while the magnetic is an inward contracting force to conserve energy. In Figure 1B, the black electro waves and brown magnetic are outward/inward circular waves respectively while the red electro waves and green magnetic waves are expanding/contracting sine waves respectively. Quarks deep in the cone apex include the black electro circular waves, the black electro sine waves and green magnetic sine waves as the proton while the brown magnetic circular waves, the brown magnetic sine waves and red electro sine waves are the neutron. Gluons are the amplitude of the wavelets like the  $e$  coupling constant but are much stronger in the cone apex holding the protons and neutrons together. Beta decay is the interaction of the black-red sine waves between the neutrons and protons. Electrons at the base of the quantum cone are the red-brown sine coupling waves and positrons are the black-green sine coupling waves. Electron(s) as a mass particle continue outwardly to interact with photon wavelets at the base of the quantum cone which is the amplitude of the  $e$  coupling constant. The electron as a wave particle propagates on the different size wavelets that form an electro atom cone.

In Figure 1B, matter is energy from electro couplings giving a point center in the magnetic field where the ratio of mass to the circumference of the magnetic circle is infinite. This ratio is  $\pi$  from the open-ended waves of the four quadrants ( $\tau$ ) in the magnetic field regardless of mass size in the electro field. Mass is the center in the electro field as a ratio in the magnetic field circle. Gravity inward forces from the magnetic field are the result of mass given that there can be no mass without gravity; hence,  $\pi$  is the result of gravity forces on mass. Mass is energy from electro waves at the apex of cone expansion in the electromagnetic field. The black-red electro wavelets and brown-green magnetic wavelets fire in a transverse quadrant where distance is the inverse of its square in the magnetic field. Magnetic field wavelet inward forces are the graviton effect on mass at the square root of  $C^2$ . Gravity will adjust inward forces to conserve energy in any kind of atom right down to the nuclei apex within the cone. As a result of the energy in a spiral cone, the cone base give the necessary amplitude for the photons and electrons to interact as a coupling and the apex or dead center in the cone is the nuclei fused in time at much shorter wavelengths. The ultra high frequency wavelets in the cone apex takes on mass as nuclei where  $E = MC^2$ . The  $e$  coupling constant, about 137.03597 is the amplitude for a real electron to emit or absorb a real photon [1]. Like the life cycle of a star, the electro couplings having a longer duration to expand will nuclei as a lighter atom such as a hydrogen atom. A star is formed when a large amount of gas (mostly hydrogen) starts to collapse in on itself due to its gravitational attraction [2].

### 3. Conclusion

$$\text{Expanded Equation: } E = C = \infty = MC^2$$

*Left Side      Right Side*

The field wavelets are open-ended as the wavelength spectrum without a boundary in the electromagnetic field. Photon wavelets are counted on the right side of the equation above with mass because  $C$  is finite in the magnetic field as gravity waves. Wavelets are not counted on the left side because  $C$  is infinite without mass from the open-ended standing waves. The bridge is the cosmological constant  $C$ . Thus,  $E = C = MC^2$ . Energy is equal to mass and conversely mass is the same as energy when  $C$  is finite because  $E$  is equal to mass and  $C^2$  on the right side of the equation in the form of space-time and is infinite on the left side of the equation in the form of standing waves. Photons are standing wavelets and travel relative to mass in the form of gravity force in the electromagnetic field. The electromagnetic field is infinite from standing waves and the mass in it is receding as a result of the different gravity levels in the magnetic field evidenced by the redshift and distance. Matter is projected as energy at each half cycle of standing waves; hence, there is no energy at the nodes where  $C = f \lambda$ . The wavelength and frequency are all that changes in the magnetic field and mass in the electro field curves the magnetic field. General relativity indicates that space-time is not flat but curved by the distribution of mass and energy in it [3]. Photons do not have mass. Mass is the rest mass at the nodes of standing waves but the wavelets in the field cone have momentum that take on mass from energy displacement in the electro field.

All mass in the electro field is subjected to the wavelength and frequency changes in the magnetic field having a constant speed of light. When the electro and magnetic field is combined into one, so also is mass and gravity and the difference in energy between the two is the time element that keeps everything finite. Since mass and gravity are interwoven at the quantum level, the speed of light is gravity force relative to mass where gravity waves change time in the magnetic field. Energy in the form of mass and  $C^2$  is space-time and energy outside the realm of time is infinite. Thus:  $E = C = \hbar\omega = MC^2$ . Indications are that reality is on the infinite side of the equation and mass and gravity are projected from it as finite energy on the right side of the equation. The speed of light  $C$  is infinite when wavelength by frequency is standing without mass in the magnetic field. The speed of light  $C$  is finite when wavelength by frequency is constant relative to mass in the magnetic field. Matter can neither be created nor destroyed on the right side of the equation as gravity will adjust conservation forces at the speed of light while time is the speed of light squared in the electromagnetic field. Infinity does not have  $C^2$  relative to mass but exists as energy without mass in the form of open-ended standing waves. Einstein's equation,  $E = MC^2$  depends on which side of the equation the energy exists. On the right side of the equation, energy is finite from mass and time. On the left side of the equation, energy is infinite because  $C^2$  is the reciprocal of mass. Mass and  $C^2$  offset each other as the difference in time energy leaving energy on the left side of the equation to be infinite as open-ended standing wavelets.

## References

- [1] Feynman, R.P. (1988). *QED The Strange Theory of Light and Matter*, Princeton University Press, p129.
- [2] Hawking, S. (1996). *The Illustrated A Brief History of Time*, Bantam Books, p105.
- [3] Ibid, pp 40-42.

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