Electromagnetic Field Waves

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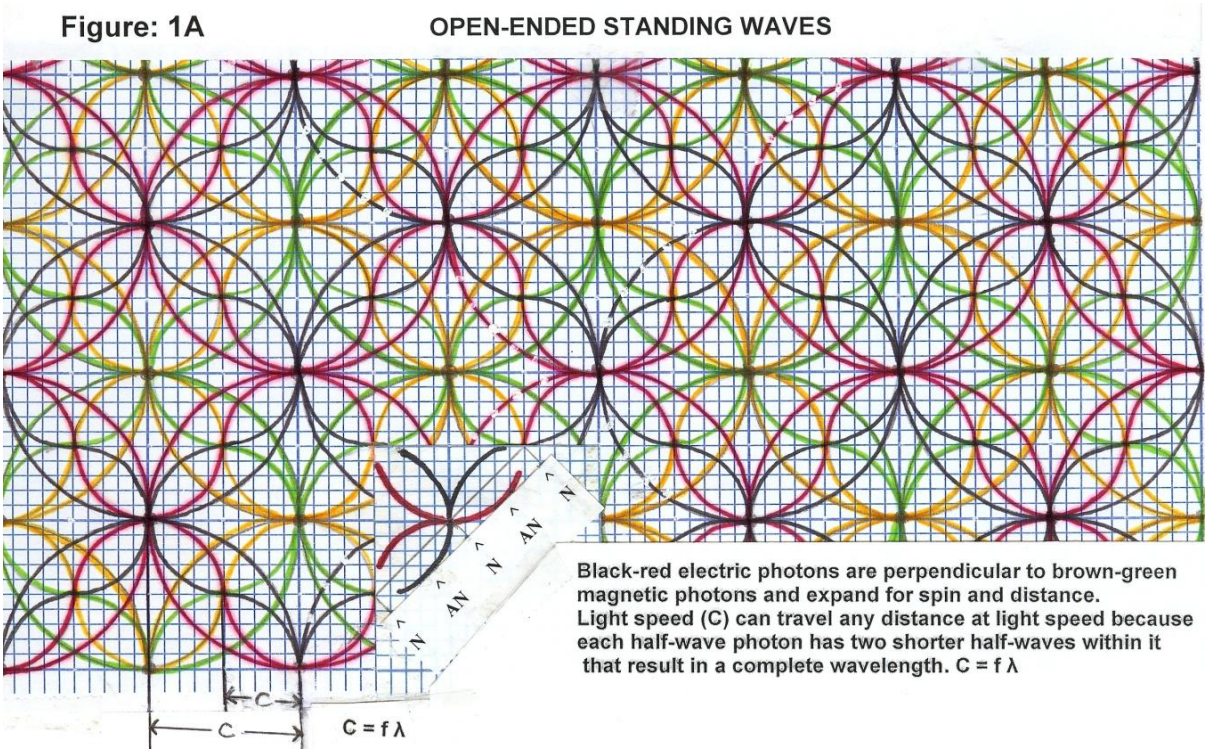
Abstract: Space is from two kinds of energy in standing waves; (1) energy with mass which is finite energy and (2) energy without mass which is infinite energy. Given light speed is equal to frequency times wavelength C = f λ then photon half waves are twice light speed on contraction before reversal expansion at light speed. Light speed is a constant relative to mass in Special Relativity but photon half waves are twice light speed on contraction from the fundamental frequency. Infinity is half wave photon energy on contraction at twice light speed without mass-time. Standing half wave photons are oscillating as medium (ether) at twice light speed where energy is infinite; consequently, energy on reversal expansion creates mass and time in the electromagnetic field.

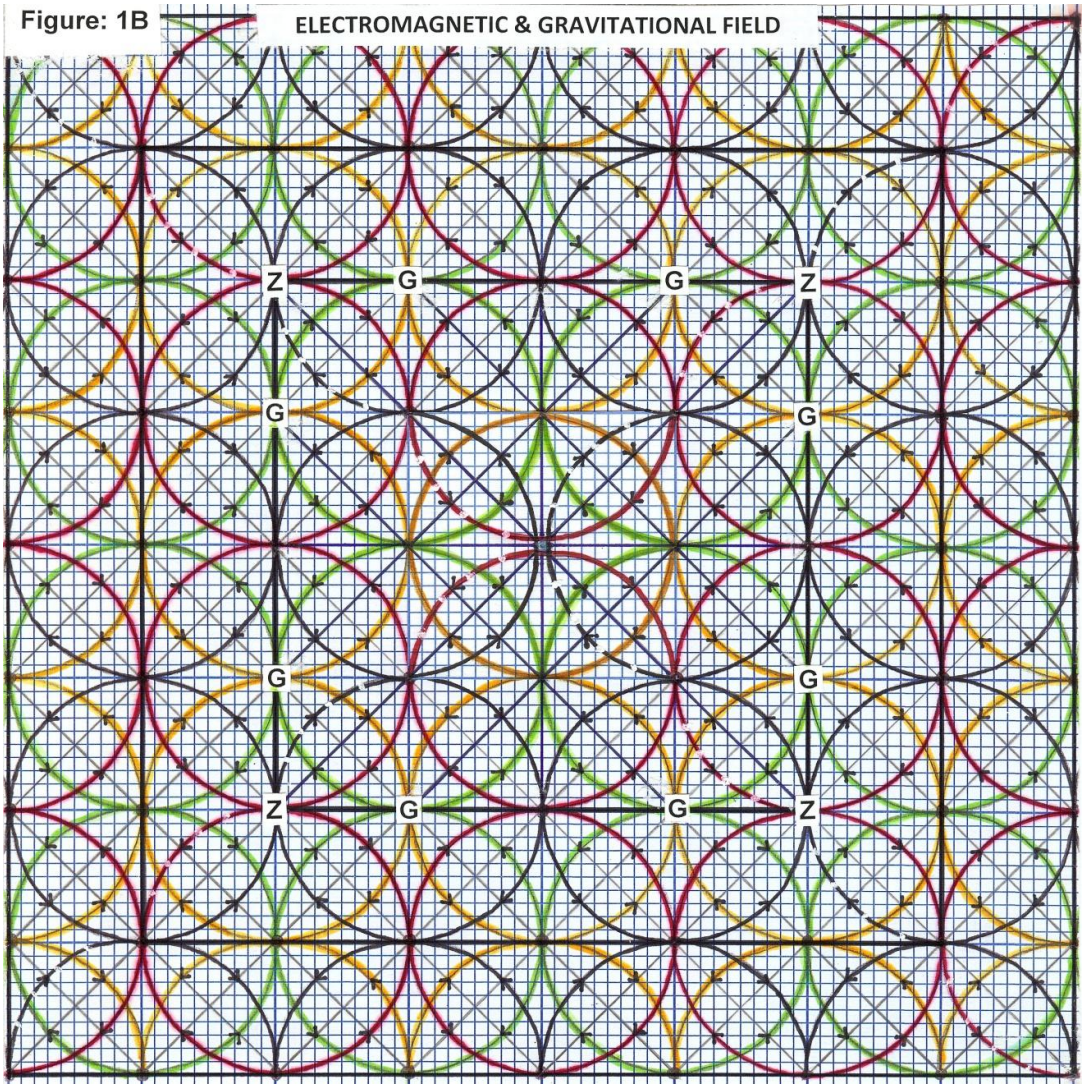
1. Introduction

Light speed is a constant on complete wavelengths; therefore photons are twice light speed on half waves. Photon half waves have twice the energy on contracting harmonic oscillations and energy at half harmonics on expansion where each photon is comprised of two shorter half waves within for complete wavelengths. In Figure 1A, half waves are open-ended where anti-nodes are in the middle and nodes at the ends such that each half wave is multiplying into full waves. Black-red electric are transverse waves perpendicular to brown-green magnetic waves. The wavelengths are getting shorter at twice light speed on contraction and longer on reversal expansion with the force of two shorter waves within each half wave at light speed. Photon half waves are twice Planck's constant on contraction having very high energy levels creating mass on reversal expansion. Photon half wave energy on expansion creates mass in the apex of a quantum cone in the electric field.



2. Report

The EM wave is comprised of photon energy. Figure 1B below depicts standing waves on reversal expansion where mass is created from photon energy at twice light speed. Moving two half waves from center in direction Z and squaring, there are four complete green magnetic circles in the square. Moving three half waves from center and squaring, there are nine complete brown magnetic circles in the outer square and so on at the inverse-square distance from center. The square of the distance is from mass center with the four corners Z. Mass at center in the electric field square Z coupled with momentum G in the magnetic field is distance and time after breakout from an expanding field cone. Black-red electric photons and brown-green magnetic photons are perpendicular to each other with the black-red expanding in direction Z and brown-green magnetic photons expanding in direction G. When black-red electric photons are expanding in direction Z, then the brown-green magnetic photons are rotating as momentum in direction G with the electric photons in Z. The magnetic field photons rotate inside the electric field photons perpendicular. Brown-green magnetic half wave photons are 90º out of phase with black-red electric half waves perpendicular; however, since each half wave photon have two shorter half waves within, then magnetic photons are in phase with electric photons at the nodes but completely out of phase at the anti-nodes for a complete wavelength, $C = f \lambda$, Figure 1A.



In Figure 1B above, it's the magnetic field photons in G rotation coupled with the electric photons in Z direction that needs clarity. Start with the upper left corner of the Z square to see how the G photons move from all four sides of the square that form a circle inside the black-red photons in Z direction. Similar to Faraday's Law of induction, the magnetic field photons moving in a circle in direction G will cause a current inside the electric field photons that move in direction Z when there is a change in field. For an increase/decrease in amplitude of electric photons expanding in direction Z, the magnetic photons will be out of phase with an attraction force at the nodes of the black electric positive and red electric negative. Magnetic waves in direction G rotating inside the electric waves perpendicular in direction Z are the inverse square distance from mass center in the electric field.

From direction of arrows in Figure 1B, the black electric and brown magnetic expand as circular and sine waves while the red electric and green magnetic expand only as sine waves. Quarks deep in the apex of a circular cone include the black electric circular waves, the black electric sine waves and green magnetic sine waves as the proton while brown magnetic circular waves, brown magnetic sine waves and red electric sine waves are the neutron. Gluons are the amplitude of half waves and much stronger in the cone apex holding protons and neutrons together. Beta decay is interaction of black-red half waves between protons and neutrons. Note: all half wave photons in finite energy have two shorter half waves within it after breakout from reversal of half wave infinite energy, Figure 1A. Electrons expand outwardly in the quantum cone where amplitude of red-brown electrons and black-green positrons interact with the brown-green photons. [The e coupling constant as the inverse of its square: about 137.03597 is the amplitude for a real electron to emit or absorb a real photon.][1].

Mass as finite energy is receding due to expansion in the field evidenced by the redshift and distance. Mass-energy equivalence is an equal function where mass is not the same as energy but equal to it when finite. Matter can neither be created nor destroyed because mass-energy equivalence is finite at light speed. The link between infinite and finite energy is twice light speed and a universe without a beginning is a universe without mass-time. Standing half wave photons are ether at twice light speed on contraction that permeates everything as medium. It follows from the wave nature of energy at twice light speed that nothing finite exists on contraction but for mass-time created from it on reversal expansion. Mass in the electric field already includes part of the magnetic field as subatomic gravity forces; the remaining magnetic field spectrum is light and gravity on mass, the remaining electric field spectrum not subject to light and gravity is dark energy and dark matter. [A star is formed when a large amount of gas (mostly hydrogen) starts to collapse in on itself due to its gravitational attraction.][2]. A metaphor to motion-picture theater: the screen is the universe, the pictures are the stars and galaxies and the projector is energy at twice light speed. We come from finite energy and see the moving pictures in mass-time.

3. Conclusion

Extended Equation: $E = ZG^2$ where ZG^2 is half wave photon energy on contraction before photon reversal in the EM field. This is twice Planck's constant: $E = 2(\boldsymbol{h}f)$ at twice light speed on contraction. Photon energy by itself can expand any distance at light speed in Special Relativity and is timeless without mass. In Einstein's $E = MC^2$ if we take mass out of the equation then E is equal to C in full wavelengths with the inverse square distance between the photon fields but in the original half wave contraction mode E is equal to 2C as infinite energy without mass and time. Time is not another dimension but rather mass energy in the electric field driven by momentum of gravitation in the magnetic field. Everything in the expansion mode is finite energy having mass in the electric field coupled with momentum of gravitation in the magnetic field.

Gravity is equivalent to the accelerating circles G which are out of phase with mass. Gravitational forces are very weak because photon anti-node forces in the magnetic field are out of phase with mass anti-nodes in the electric field. When mass energy don't exist (0 at the nodes in the electric field at light speed), then gravity exist in the magnetic field with the full force equal to mass energy but when mass energy do exist (1 at the anti-nodes in the electric field at light speed), then gravity force in the magnetic field is very weak when out of phase with mass in the electric field. This brings to mind Heisenberg's uncertainty principle where the standing position of an electron in the electric field cannot be measured simultaneously with momentum in the magnetic field. The reason is because the two fields are reciprocal of each other at light speed. Mass as a reciprocal of gravitation is outlined as follows:

$E = M C^2$ (From photon reversal expansion in the Electromagnetic field).

$1 = M C$ (Electric Field "C" times Magnetic Field "C" $= C^2 = 1$).

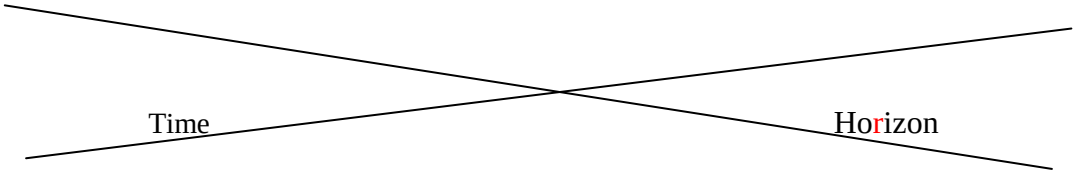
$C = 1/m$ (C^2 or 1 applies to the square of the distance between Electric and Magnetic fields).

$G = 1/m$

Standing half wave photons at twice light speed on contraction is infinite energy in a quadrant grid (EM Field) without mass and time. The photon half waves (quanta) on contraction will build-up a very strong force with the square of the distance getting shorter reaching a point of reversal expansion in full wavelengths at light speed.

Electromagnetic field waves on contraction at twice light speed

Infinite Energy = ZG^2



Finite Energy = MC^2

Electromagnetic field waves on expansion at light speed

Standing full wave photons in the electromagnetic field grid after reversal expansion have two shorter half waves within each half wave at light speed. Infinite energy on contraction creates finite energy on expansion in the form of mass, time and distance.

In summary, standing half wave photons on contraction at twice light speed with same amplitude out of phase will reach a point of reversal expansion due to the square of the distance getting shorter and shorter. Half wave standing photons are space medium at twice light speed while full wave photons have two shorter half waves within after reversal expansion. The switch between magnetic wave antinodes and electric wave nodes is out of phase at light speed with the magnetic waves rotating inside the electric waves perpendicular in direction Z. Mass in the electric field and acceleration in the magnetic field are reciprocal and inversely proportional to the changes between them with the same net force. Mass in the electric field curves the magnetic field in general relativity and mass expanding in the magnetic field is mass-time. [Space-time in general relativity is not flat but curved by the distribution of mass and energy in it.][3].

The standing waves are open ended where the fundamental frequency is infinite at twice light speed without distant borders having a medium to support finite energy and mass-time. Space is infinite energy where the standing medium is without distance and time while space with mass is finite energy having gravitation as distance and time. Photon waves can expand to any distance at light speed because of frequency and wavelength but when mass is created then momentum is born along with distance and time. Time has a beginning as mass-time (mass-gravitation) in finite energy at light speed but time and mass do not exist in the medium before reversal expansion where the standing waves expand and contract at twice light speed. Energy in the universe expands in the electric field at light speed in full wavelengths as mass-time and contracts in the magnetic field. Reciprocity between electric and magnetic fields in phase and totally out of phase define existence and non-existence of mass at light speed along with the reason for having very weak gravitational forces in the magnetic field when mass exist and very strong gravitational forces when mass do not exist. We see the moving pictures in mass-time at light speed and mass decay is gravitational pull in the magnetic field toward the infinite side of the energy equation where the photon half waves contract on the square of the distance between the two fields at twice light speed.

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. General Relativity background field in Figure 2.16 p41 is similar to the diamond-squares (rhombus) background in Figure 1B above.