

# Electromagnetic Field Waves

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Abstract: Standing half wave particles at light speed twice in expansion-contraction comprise a static universe where two transverse fields  $90^\circ$  out of phase are the square of distance from each other. The universe has a static concept to time since the infinite universe is a static universe without a beginning or end. The square of distance is a point of reversal in expansion-contraction between the fields as a means to conserve energy. Photons on expansion in the electric field create matter energy while photons on contraction in the magnetic field create light energy and gravitational pull toward the higher frequency energy. Also, the universe with matter has a moving physical concept of time from gravitational pull on expansion-contraction.

## 1. Introduction

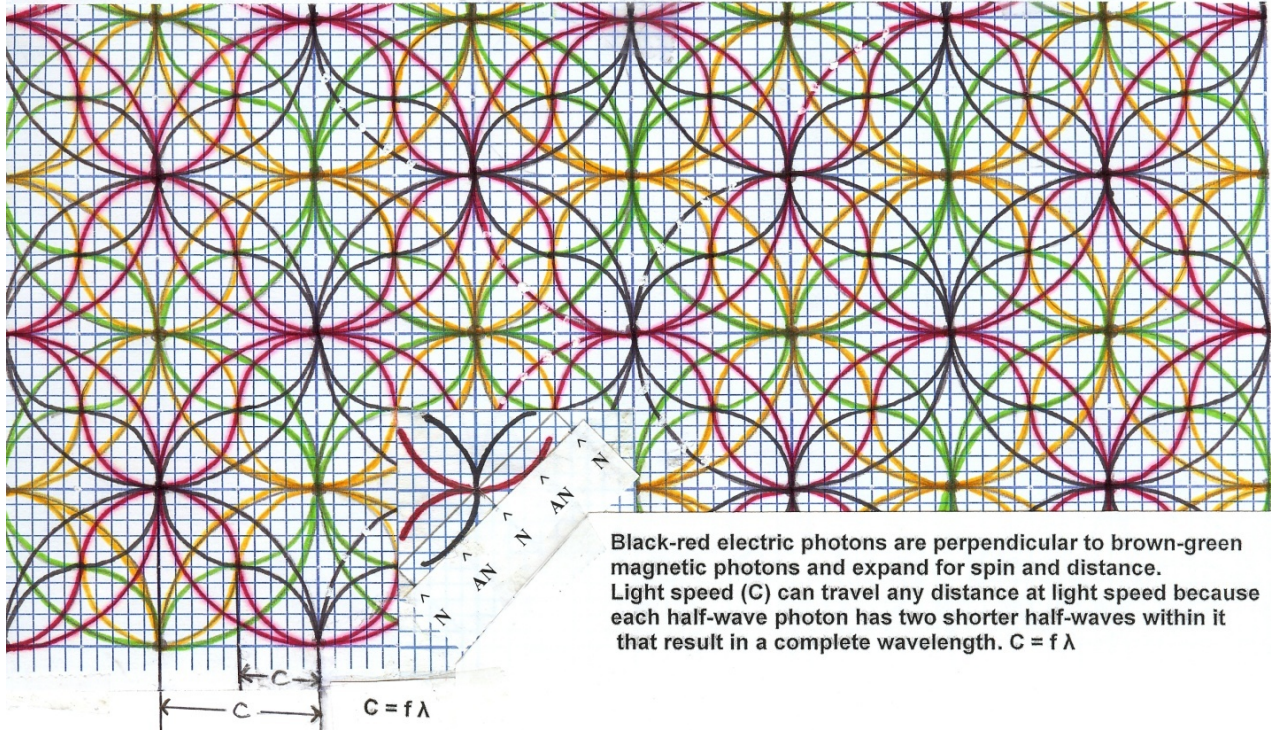
Expansion of the electromagnetic field occurs at light speed in half wavelengths and contraction occurs at light speed in half wavelengths so the full expansion-contraction oscillation occurs at twice light speed in half wavelengths  $90^\circ$  out of phase. The driving force in the electric field is expansion while the driving force in the magnetic field is contraction. The universe is comprised of half wave photon energy on expansion-contraction having infinite energy at twice light speed in full harmonic. Finite energy consists of half wave photon energy on expansion at light speed having properties of matter in the electric field while finite energy on contraction at light speed in the magnetic field have gravitational pull from the prior higher frequency in full wavelengths.

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. Mass as finite energy is receding due to expansion of the electric 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 the mass-energy equivalence is finite at light speed. The link between infinite and finite energy is energy at twice light speed. Standing half wave energy is ether at twice light speed on expansion-contraction that permeates everything finite as medium.

In Figure 1A, half wave photons are open-ended where anti-nodes are in the middle and nodes at ends such that each half wave is multiplying into full wavelengths. Photon half waves as infinite energy are twice Planck's constant on expansion-contraction having very high energy levels that create matter in a quantum field cone. Black-red electric photons are transverse waves perpendicular to brown-green magnetic photons. In Figure 1A, it should be noted that the shorter full wave black-red electric photons (center of half waves) are in phase at the nodes with the shorter full wave brown-green magnetic photons but  $180^\circ$  or twice  $90^\circ$  out of phase at the anti-nodes perpendicular.

Figure: 1A

OPEN-ENDED STANDING WAVES

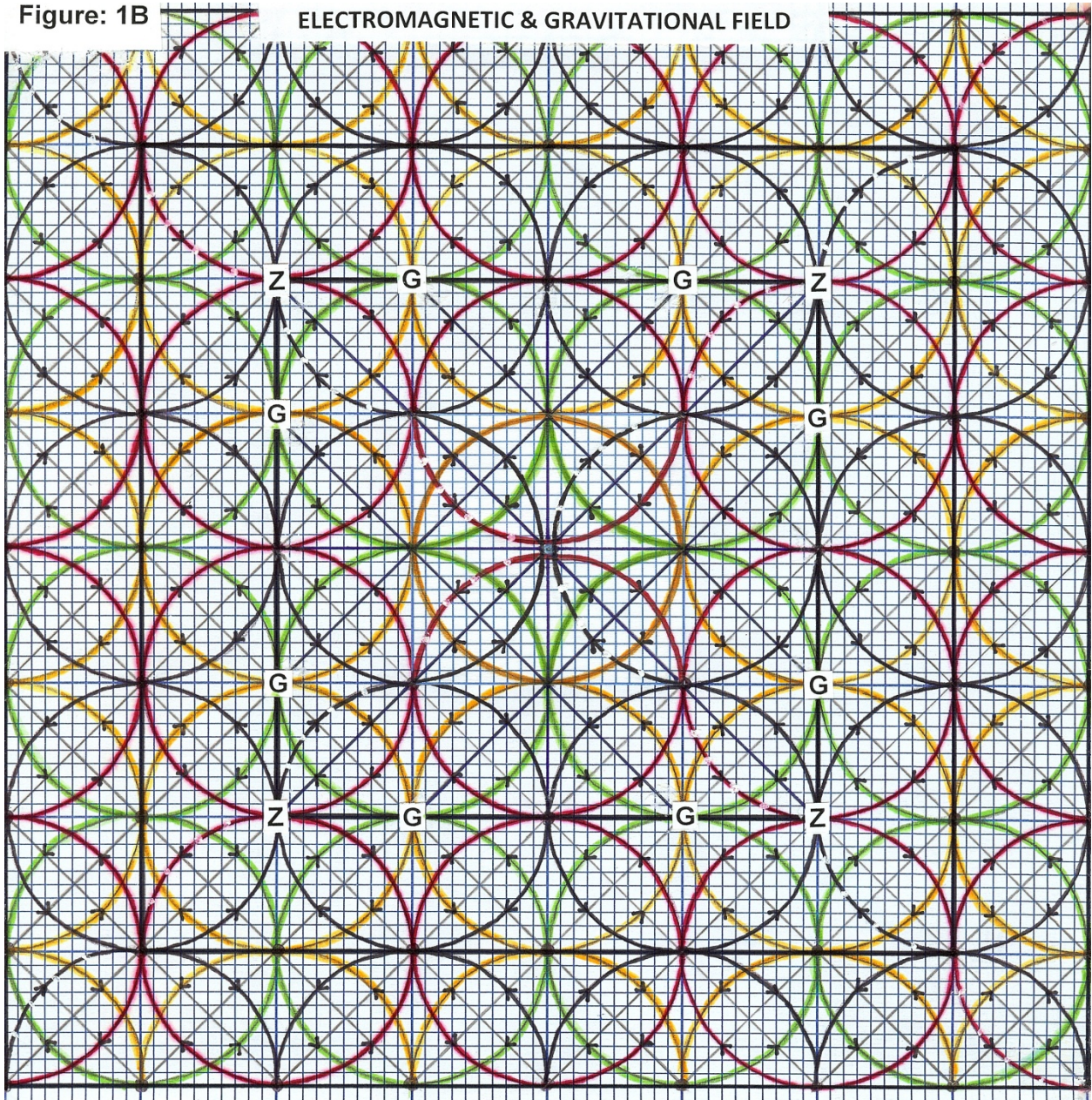


## 2. Report

Electromagnetic waves are comprised of photons on expansion-contraction. Figure 1B below depicts half wave photons on expansion-contraction where matter 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 between the two fields. Mass at center in the electric field Z coupled with momentum G in the magnetic field is matter with gravitational pull (physical time) after breakout from an expanding field cone. Black-red electric photons and brown-green magnetic photons are perpendicular to each other with black-red expanding in direction Z and brown-green magnetic photons on contraction in direction G. When the perpendicular black-red electric photons are on expansion-contraction in direction Z, then the brown-green magnetic photons are rotating in direction G as momentum inside the electric photons in Z. Expansion of matter energy in the electric field already includes part of the magnetic field as subatomic gravitational forces; the remaining magnetic field spectrum is light energy and gravitational pull on contraction toward the higher frequency energy; the remaining electric field spectrum not subject to light energy and gravitational pull is dark energy and dark matter.

Figure: 1B

ELECTROMAGNETIC & GRAVITATIONAL FIELD

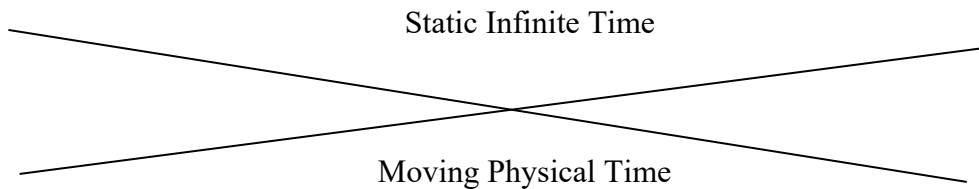


In Figure 1B above, the magnetic field photons in G rotation coupled with the electric photons in Z direction needs clarity. Start with the left corner of the Z square to see how the G photons move from all four sides of the square to form a circle inside the black-red electric photons perpendicular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

From direction of arrows in Figure 1B, above, the black electric and brown magnetic propagate as circular and sine waves while the red electric and green magnet propagate only as sine waves. Quarks deep in the apex of circular field cones 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 electric half waves between protons and neutrons. Note: - all half wave photon particles in finite energy come in pairs from the prior higher harmonic having two shorter half waves within each half wave in complete wavelengths. Electrons expand outwardly in the quantum field cone where amplitude of the 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]. Electricity and Magnetism is the rapid motion of the red electrons in a wire coupled with the brown circular magnetic waves from the right hand rule.  $I^2 R$  is inverse square distance of magnetic field current on a wire coupled with resistance of the wire for wattage. Voltage is frequency of the G photon rotation (momentum pressure) in the EM field.

### 3. Conclusion

$$\text{Half Wave Full Harmonic Infinite Energy} = ZG^2$$



$$\text{Full Wave Half Harmonic Finite Energy} = MC^2$$

$E = ZG^2$  where  $ZG^2$  is half wave photon energy expanding in the electric field in direction Z at light speed and returning at square of distance in the magnetic field on contraction at light speed which is twice light speed for a full expansion-contraction oscillation. This is twice Planck’s constant:  $E = 2(\hbar f)$  at twice light speed from full oscillation. Standing wave infinite energy have infinite standing time as opposed to finite energy with matter having moving physical time from gravitational pull toward infinite time. Photon energy can extend to any distance at light speed because of frequency and wavelength and timeless without mass. Time is not another dimension but rather mass energy in the electric field driven by gravitational pull in the magnetic field. When matter is created in the electromagnetic field from energy at twice light speed on expansion-contraction, distance comes into the picture at the square of distance between centers of mass. Everything in expansion-contraction with matter is finite energy coupled with gravitational pull in the magnetic field. This brings to mind Heisenberg’s uncertainty principle where 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 out of phase.

$C^2$  is numerically one (1) at anti-nodes and numerically zero (0) at nodes as multiplier and offset to mass due to reciprocity between fields in complete wavelengths  $180^\circ$  out of phase.  $E=M(1)$  is mass at anti-nodes in the electric field on expansion at light speed with moving physical time from gravitational pull in the magnetic field on contraction at light speed. Matter does not exist in finite energy at light speed when full wave base photons in expansion-contraction are in phase at the nodes. Thus:  $E=M(0)$  is when the electric and magnetic field photons are in phase at nodes in full wavelengths. Mass as a reciprocal of gravitational pull is outlined as follows:

**$E = M C^2$**  Einstein's equation on mass and energy.

**$E = M (1)$**  Electric Photons "C" divided by Magnetic Photons "C" = (1) at anti-nodes.

**$E = G (1)$**  One (1) is a multiplier and offset to mass and gravitation at anti-nodes.

**$1 = M/G$**  Mass and Gravitational pull are reciprocal from full wave base photons in phase at nodes and  $180^\circ$  out of phase at anti-nodes on expansion-contraction.

Photons in the electromagnetic field have transverse electric half waves  $90^\circ$  out of phase with the magnetic half waves. The half wave photons serve as the "particle" function. Half wave base particle photons in the magnetic field  $90^\circ$  out of phase with the electric field provide the total spectrum of electromagnetic waves and usage properties including light energy. The rotating half wave photons of the magnetic field inside the transverse half wave photons of the electric field provide momentum change in electromagnetic energy. [A star is formed when a large amount of gas (mostly hydrogen) starts to collapse in on itself due to its gravitational attraction.][2].

Full wave base photons serve as the "wave" function having two shorter half waves within each half wave photon from the prior higher frequency at twice  $90^\circ$  or  $180^\circ$  out of phase between the electric and magnetic fields. Full wave base photons at anti-nodes create matter in the electric field on expansion while full wave base photons at anti-nodes in the magnetic field create gravitational pull on contraction. Gravitational pull in the magnetic field  $180^\circ$  out of phase with mass in the electric field have very weak forces because the two fields are completely out of phase on expansion-contraction. General Relativity is curvature of the electromagnetic field photons by mass in the electric field on expansion-contraction. [Space-time in general relativity is not flat but curved by the distribution of mass and energy in it.][3].

In summary: Photons on expansion in the electric field in infinite energy will become weaker on expansion and become more dense helping to take on properties of mass as protons, neutrons and electrons while photons in the magnetic field will not become weaker due to having inverse square distance on expansion but act as an offset to mass on contraction for equilibrium in the form of gravitational pull. Photons at very high energy levels create the different elements in the periodic table due to changes of momentum, frequency and wavelength in the electric field on expansion coupled with the magnetic field on contraction. The fundamental frequency of open-ended standing waves (static infinite cause of action) in infinite energy is connected to everything finite where the frequency space-time pictures in expansion-contraction are past, present and future. God and science are infinite since static time is infinite time.

## 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. Background field in Figure 2.16 p41 is similar to diamond square foreground in Figure 1B above that depict photon energy in general relativity.

## Notes

In a static universe, the electromagnetic field in standing wave energy offer many solutions that otherwise would not seem possible. Infinite energy is photon energy at twice light speed on expansion-contraction oscillation. Photons at light speed are on expansion in the electric field and on contraction in the magnetic field. The “black-red” electric photons are on the Z axis and “brown-green” magnetic photons are on the G axis at right angles to each other. As part of standing waves, the “black” electric and “brown” magnetic waves have full circular waves with same amplitude coupled with vectors of the “red” electric and “green” magnetic as sinusoidal waves. Dark energy with dark matter on expansion of the electric field just sits there indefinitely as part of infinite energy while mass energy in the electric field is subject to gravitational pull on contraction of the magnetic field as finite energy in moving physical time. In the overall standing wave field, the quadrant photons relate to Pi as an irrational number similar to the “e” coupling constant because the quadrant energy never closes in open-ended standing waves on expansion-contraction. The standing wave-particle photons apply to special relativity where light speed is the same for all observers. Hydrogen atoms have only one proton and one electron while other elements in the periodic table have multiple protons and neutrons bonded together having multiple electrons that interact due to changes of finite energy on expansion-contraction.

The permeability of free space for the magnetic field is reduced to C where  $\mathbf{B} = \mathbf{E}/C$  or  $\mathbf{C} = \mathbf{E}/\mathbf{B}$ . Thus: E and B are reciprocal into C as one (1) at antinodes in standing wave energy.  $C^2$  or  $(1)^2$  is also one (1) at antinodes and (0) at nodes in full wavelengths. The square of distance is already between the two fields in the Z and G square and Pythagorean Theorem.

## Definitions

Infinity: - Standing waves at twice light speed in a timeless state without a beginning or end,

EM Waves:- Sinusoidal wave photon energy that travel in standing wave infinite energy.

Nothingness: - Finite energy at the nodes of standing waves in full wavelengths.

Time: - Mass or matter that moves with gravitational pull in finite energy.

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