

# Spin Generates Gravity and Lepton Propagation

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## Abstract

Fields have an infinite distance of influence and act instantaneously without transit time of a vector boson. Spin creates gravity. Spin creates lepton propagation.

## Keywords

Fields, gravity

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## Claims of Novelty

- Fields have an infinite distance of influence
- Fields propagate instantaneously without time of flight of a vector boson

## Mathematical Foundation

This paper's mathematical method uses vectors because they don't refer to arbitrary coordinates. Unit values are used in equations so empirical constants are not necessary. In particular, vector cross products are used to define values in another dimension.

- The symbol is  $\times$  or  $\times$  or  $\times$  means cross product or vector product or directed area product.
- A new operator  $\underline{\times}$  or  $\underline{\times}$  or  $\underline{\times}$  means the inverse cross product, which amount to division.
- For example,  $\underline{\times} v \times v$  is the directed area product of velocity and velocity.
- The scalar  $v^2/c^2$  can be written as a vector  $(v \times v) \underline{\times} (c \times c)$ .

Cross products preserve the sign of the input vectors. In normal algebra  $(-c) * (+c) = +c^2$ , but the cross-product yields  $(-c \times +c)$  and the resultant sign depends on choosing right- or left-hand rule for vector products.

## Chapter 2 Introduction

### Dedication

This work is dedicated to Ginger

### Previous Work

The text and diagrams are substantially the same as my paper posted on the physics archive <https://vixra.org/abs/2209.0057>. More specifically, this paper attempts to illustrate the concepts put forward in [Tetrons, viXra.org e-Print archive, viXra:2307.0050](https://vixra.org/abs/2307.0050).

### Matter and Antimatter Congruent Pairs

Much of the material in this paper relies on the matter and antimatter congruent pair concept, which originated in the cosmology reference<sup>1</sup>. This congruence occurs at the tetron level, where spins interact. A matter observer only sees charge produced by matter particles. For example, a matter observer sees the proton charge is  $uud$   $2*(+2/3) + (-1/3) = +1$  and the neutron is  $ddu$   $2*(-1/3) + (+2/3) = 0$  where  $u=+2/3$  and  $d=-1/3$ . At the unseen tetron level, spins interact because they are congruent. Plus and minus spins are in different dimensions, so the summation of spin numbers is meaningless.

## Chapter 3 Fields

### The Strong Force

Gluons are the locus of the strong force. A primary gluon is formed at each of the 3 central triangle vertices where a pair of quarks join, noted by red circles below. A secondary gluon is also formed at the junction between two spine tetrons quarks, noted by blue concentric ellipses below. Lastly, in a high energy state, a gluon can simply be the result of extra mass added to a quark's spine tetrons via  $E=mc^2$ . Spine tetrons are at vertices 2,3,5,6,8,9 in the diagram below.

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<sup>1</sup> [A Three Curvatures Universe Model, viXra.org e-Print archive, viXra:2307.0106](https://vixra.org/abs/2307.0106)

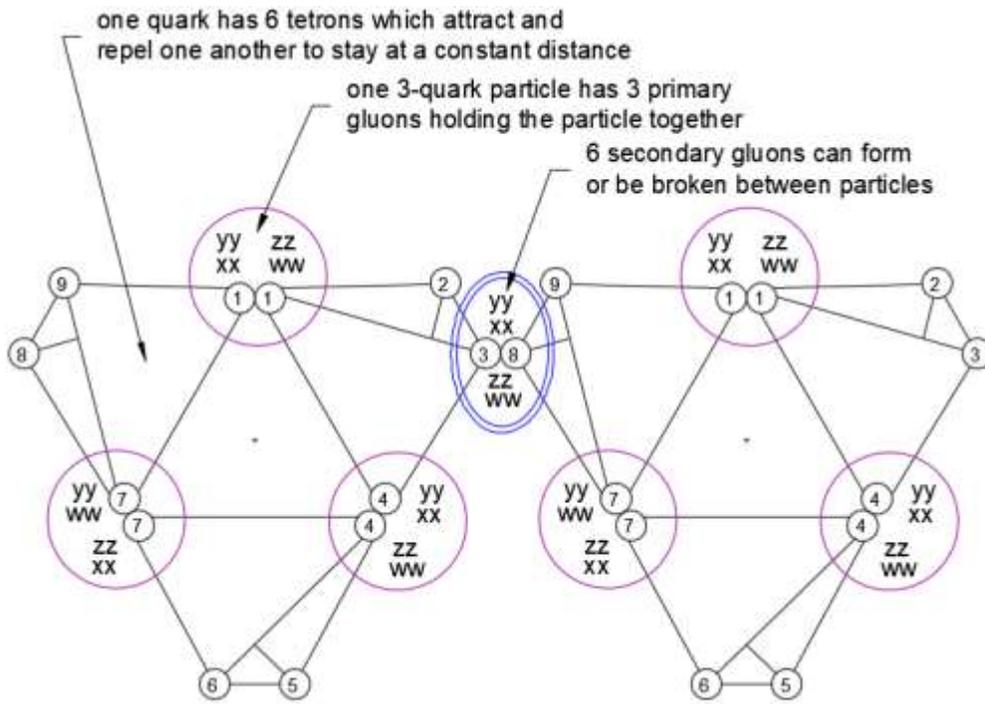


Figure 1 - Comparing Forces Within a Quark, Particle and Between Particles

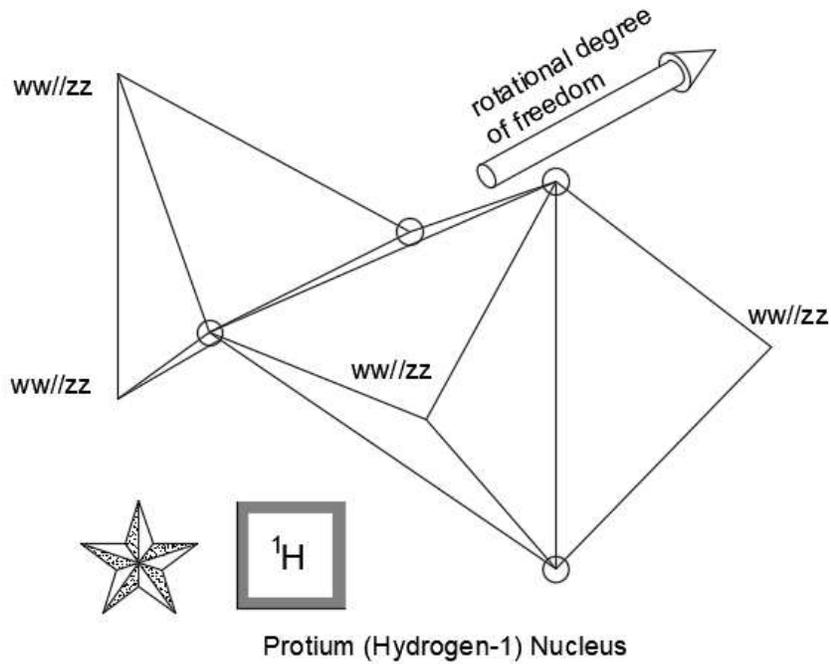


Figure 1 - Hydrogen Nucleus

### Gravitational field

The preceding paper Tetrons<sup>2</sup> contains an assertion that “Plus-spin operates in a different dimension from minus-spin. Plus-spin and minus-spin form a cross product area named mass.” For fermions, matter is always plus spin and antimatter is always minus spin. Charge attraction and thus charge cancellation occurs between plus charge and minus charge tetrons. Two plus spin and two minus spin tetrons exist congruently in each of the 3 gluons at the vertices of the central triangle of fermions. Plus and minus spins can coexist in the same location, per the Pauli principle. When a plus and minus spin exist together, they form a cross product which is mass and which forms the strong force that binds the gluon together. The mass thus created interacts with other masses at a distance.

The deuterium nucleus shown below is an example of 2 particles joined at 3 vertices by joint gluons. Also shown are the central gluons attaching the quarks together to form a particle.

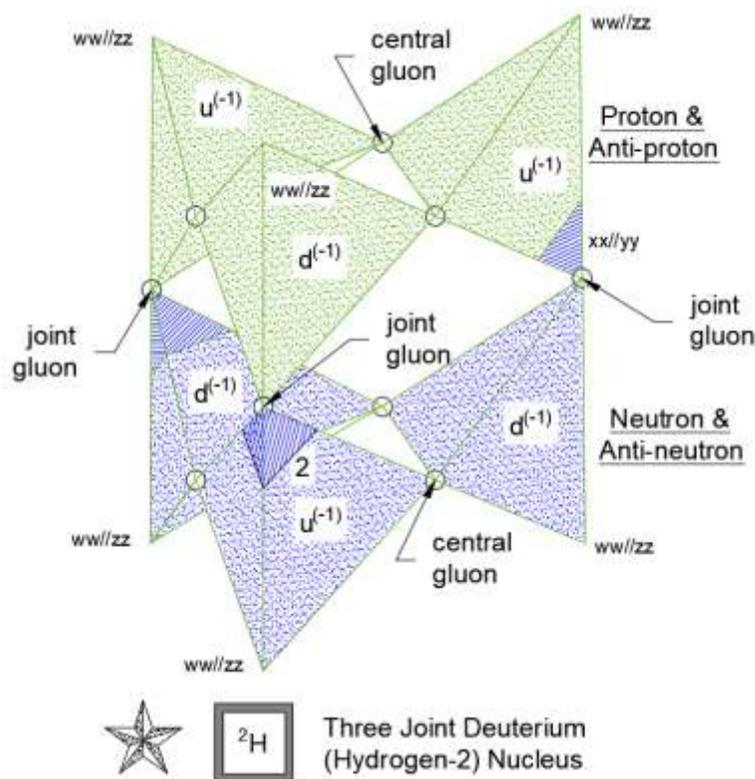


Figure 3 - Deuterium Nucleus

One unit of mass = (one unit of +spin) X (one unit of -spin)

One unit of gravitational force = ((one unit of +spin) X (one unit of -spin))/r

$$F = G * (m_1 * m_2 / r^2)$$

Neglecting the constant to make the units correct, the gravitational force is  $m_1 * m_2 / r^2$

Since multiplication is associative and commutative, it is also  $(m_1/r) * (m_2/r)$ .

<sup>2</sup> [Tetrons, viXra.org e-Print archive, viXra:2307.0050](https://arxiv.org/abs/2307.0050)

What does “m/r” mean? The best description is the gradient (slope) of a single mass field. What is the cross product of two mass gradients as in  $(m_1/r) \times (m_2/r)$ ? The best description is the mutual gradients between  $m_1$  and  $m_2$ .

Putting the spins back in the equation:

$$\begin{aligned}
 &(((+spin_1) \times (-spin_1))/r) \times (((+spin_2) \times (-spin_2))/r) \\
 &(((+spin_1) + (+spin_2))/r) \times (((-spin_1) + (-spin_2))/r) \\
 &((\Sigma +spin_i) /r) \times ((\Sigma -spin_i) /r) = \text{sum of mutual gradients} \\
 &(\Sigma +spin_i) /r = \text{sum of +spin gradients (matter)} \\
 &(\Sigma -spin_i) /r = \text{sum of -spin gradients (antimatter)}
 \end{aligned}$$

Postulate that like spins are attracted to one another, and unlike spins are repelled by one another. The exception is when opposite charges draw opposite spins together in a gluon. Once in a gluon, the opposite spins form a cross product of mass. The reason like spins attract is a tetron with a given spin already has a spin field established. Another similar spin tetron adds to the first tetron’s spin field, per the example summation of spin gradients given above. The importance of the summation is to show that signed spin gradients can be summed whereas there is no scalar arithmetic possible between plus and minus spins. The naming of plus and minus spin is unfortunate and misleads one to subtract minus spin amounts from plus spin amounts. It would be better that +spin be named right spin and -spin be named left spin.

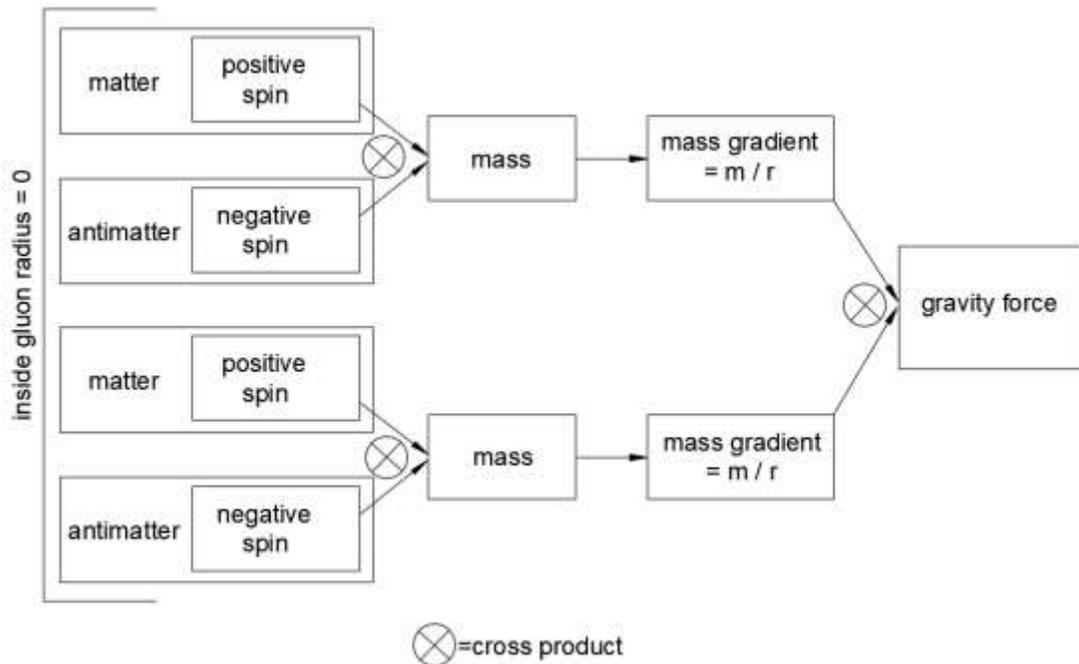


Figure 4 - Spin Creates Gravity

Since fields are infinite, a summation of gravitational attractions is pair by pair, to the limit of masses in the universe.

Electrostatic field

Another field instance is the electrostatic field. The gradient (slope) of a charge field is  $q/r$ . The electromotive force between two charges bodies is  $(q_1/r) \times (q_2/r)$ . This is also written as a cross product because the electromotive force is an area. Although  $q_1$  and  $q_2$  operate in the same dimension and are therefore scalars when together, while creating an electromotive force,  $q_1$  and  $q_2$  act as vectors.

Magnetic field

The gradient of a magnetic field is  $B/r$ . The magnetism between two magnets is  $(B_1/r) \times (B_2/r)$ .

## Chapter 4 Review of Gravity

Galileo's Experiment

As told by history, Galileo dropped an iron cannon ball and a same diameter cork ball from the Leaning tower of Pisa. They hit the ground at the same time, contrary to the layman's expectation that the heavier ball would hit the ground first. The same diameter balls negated air friction differences of two different size balls.

Consider two sacks of marbles. The sacks are different sizes and contain identical marbles. One sack's marbles total the same weight as the iron cannon ball and the second sack's marbles total the same weight as the cork ball. If both sacks have rip cords that are pulled at the same instant, which group of marbles will hit the ground first? They will all hit the ground at the same time. Which sack they came out of makes no difference. If you consider a marble to be a matter particle with 12 tetrons, that would be the spin fields of 12 plus spin tetrons attracted to the earth with all its combined plus spin fields. Since all items are made of tetrons, substitute tetrons for marbles and you will understand why the iron and cork balls hit the ground at the same time.

Fermions

A spin field by itself does not constitute gravity. A receiving or responding tetron's spin is necessary to call this gravity. The spin field is received and acted on by all spins in all tetrons. Gravity is a mutual relationship. Gravity waves and gravitons are not necessary to make gravity work. Fields don't oscillate. A gravity field provides a gradient to move tetrons in 3D.

The spin field from a single hydrogen nucleus pervades the universe. A spin field goes thru everything without velocity. Like all fields, it is communicated instantaneously without time passage.

In addition to matter//antimatter pairs creating a gravity field, they also are affected by it. One unit of gravity field is one unit of gradient towards to center of the gravity field. There is no transmitter/receiver relationship in gravity where the earth is a transmitter and an apple is a receiver. There is, however, a mutual relationship between every single tetron which moves toward every other tetron. Since all matter contains tetron pairs, all particles have potential to move due to gravity. Earth attracts apple, apple attracts earth.

Measured spin is different from this paper's simple counting of tetron spins for the purpose of accounting for gravity. A lengthy discussion of how spin is calculated is found in this Wikipedia article<sup>3</sup>. Briefly, measured spin is associated with a non-zero magnetic dipole moment via the relation to the gyromagnetic ratio, the proportionality between the angular momentum and the magnetic dipole moment of a spinning charged sphere.

### Leptons

Leptons always work in matter//antimatter congruent pairs both while orbiting in an electron shell and self-propagating in a straight line. A matter observer sees only the matter electrons and does not see the positrons. This matter observer sees both the plus and minus spin electrons. In another paper<sup>4</sup>, it is argued the plus and minus spin electrons are the left and right polarities of light.

In the electron shell, the plus and minus spin electrons occupy a single shell per the Pauli principle. The electron and positron have a different arrangement of spins:

- Plus and minus spin pairs create a cross product spin field which powers the orbital motion
- The frequency of the incoming photon determines the precession angular velocity of electron's orbit.

In straight line travel, the plus and minus spins of the electron//positron:

- Plus and minus spin pairs create a cross product spin field which powers the helical motion and which propagates the linear travel at velocity  $c$ .
- The precession angular velocity of the electron orbit determines the outgoing frequency of the light beam.

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<sup>3</sup> [https://en.wikipedia.org/wiki/Nuclear\\_magnetic\\_resonance](https://en.wikipedia.org/wiki/Nuclear_magnetic_resonance)

<sup>4</sup> [Photon Polarity, viXra.org e-Print archive, viXra:2307.0095](https://arxiv.org/abs/2307.0095)

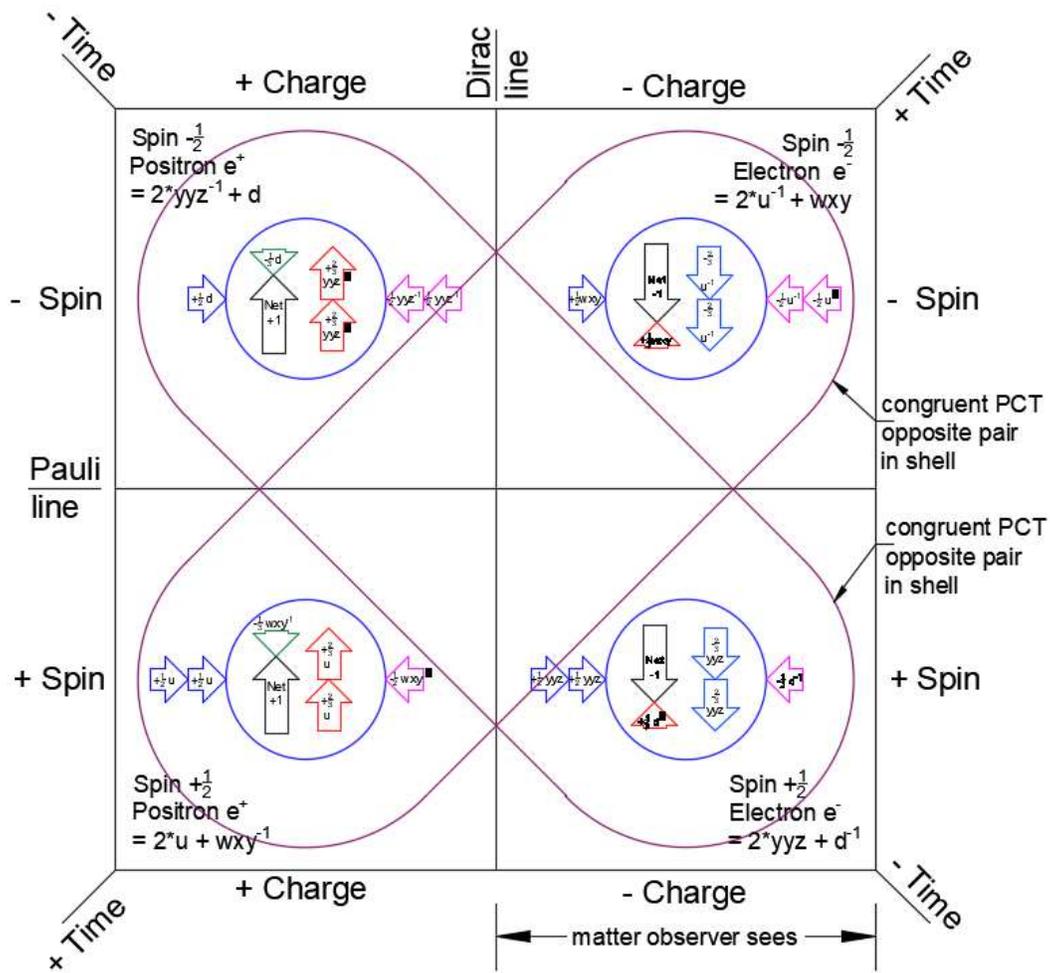


Figure 5 - Photon Complex

The angular momentum of an orbiting electron while in a shell becomes linear momentum in the tangent direction when the electron exits and becomes the photon. While traveling linearly, the electron's helical radius is maintained as if it is still in an electron shell orbit. The tangential velocity of the lowest electron level is always  $c$ . Presume all entrances and exits of the photon to and from the atom are via the lowest level  $s$  orbit.

In linear travel, an unpolarized light beam contains plus and minus spin electrons. In this circumstance, the plus spin electron and minus spin electron form a separated pair of mutually rotating particles.

In a fermion, a spin cross product would yield a spin field which is mass and extends its mass field infinitely. In a lepton, which is not a field, that same cross product extends its field in one direction, due to conservation of energy which allows only one path for the photon to travel. That one path begins at the exit from an electron shell and ends at some termination electron shell.

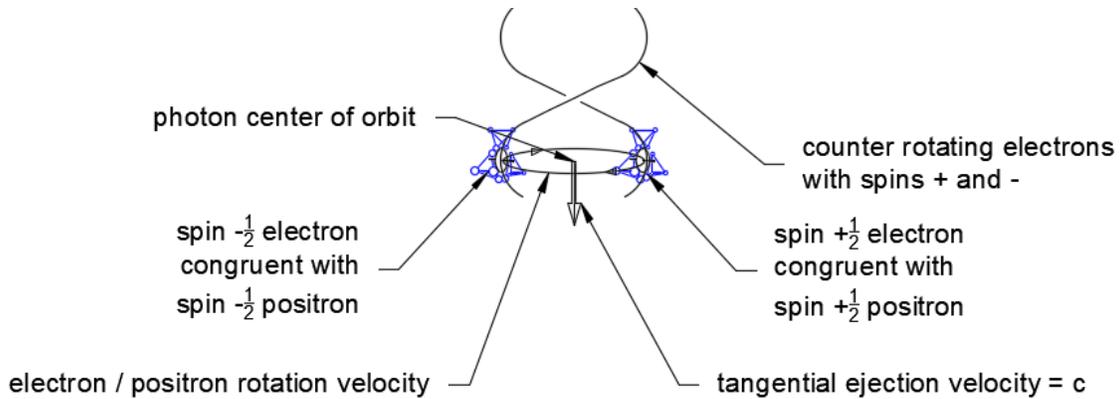


Figure 6 - Unpolarized Photon

The electron becomes the photon which is charge neutral whether polarized or not. Internally, the electron still has its charge and spin, but the negative charge has been neutralized by the congruent positron's positive charge. The matter observer who saw an negative electron in an orbit now sees no charge. When the photon is absorbed into an electron shell, the unpolarized photon divides back into both polarities of spin of electron//positron pairs.

The photon is charge and spin inert when its electron//positron components are outside of an electron orbit. Neutrino//anti-neutrino pairs are also charge and spin inert, except when a specific C quark tetron pair is attracted to opposite spins in a specific nucleon C quark tetron pair. This neutrino exception is the beta reaction discussed in detail in [The Weak Reaction, viXra.org e-Print archive, viXra:2307.0076](https://vixra.org/abs/2307.0076)

A traveling photon's internal charge and spin states cause propagation in space, but leave it unaffected by electric, magnetic or gravitation fields. Propagation by the photon is bidirectional. Propagation of a photon from an emitting atom in cause-effect direction is balanced by propagation of an anti-photon toward that emitting atom. Because the anti-photon is antimatter, its velocity is reversed and propagation occurs in cause-effect direction congruent with the photon. This anti-photon is composed of positrons whereas the photon is composed of electrons. The photon is bound to the anti-photon at the tetron level.

We normally think of a field as infinite in extent. However, according to the spherical path of a photon in a spherical universe, the end pole of a photon's field is the anti-photon PCT pair. Since the universe is a collapsed sphere, that anti-photon has been traveling with the photon all along. As the photon//anti-photon travel, the spin field generated by one side of a gluon's matter//antimatter pair's tetrons are immediately terminated the other side of the gluon's opposite tetrons. It is as if the spin field reached the end of the universe, which was at the beginning.

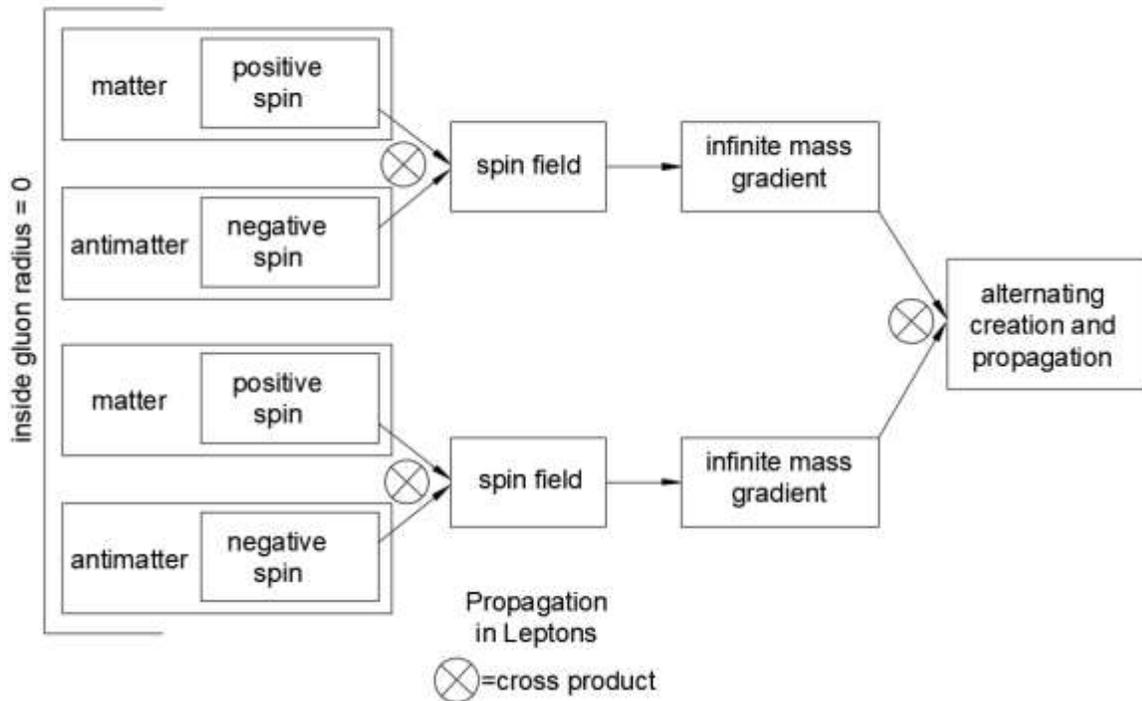


Figure 7 - Spin Creates Lepton Propagation

Because the spin energy of the photon is expended in propagation, it is not expended in moving toward a gravity source in the center of a gravity field. Likewise, the charge neutral photon//anti-photon complex is using all its charge energy propagating and not expending charge energy moving toward a charge source at the center of a charge field.

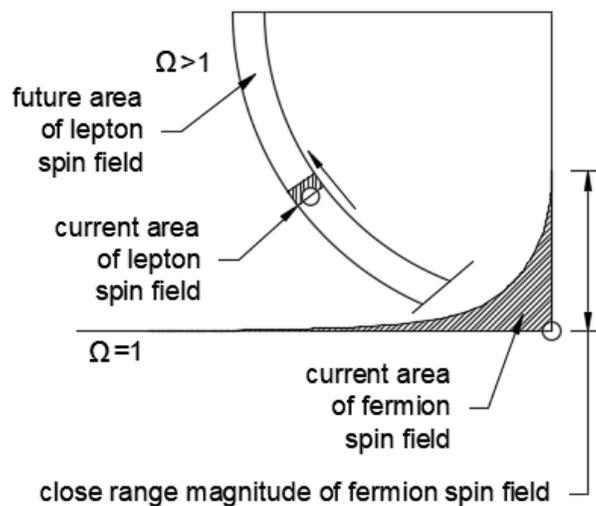


Figure 8 - Static vs Dynamic Spin Field

Propagation is like gravity without the necessity of a field to gravitate along. Or, in the case of charge, propagation is like electric attraction without the necessity of an electric field to attract to or be repulsed from. Propagation is a short circuit version of gravity.

In both propagation and gravity, tetron pairs are responding to the field created by two tetron pairs in gluons. The difference is 3/2 spin nucleons with their two tetron pairs in gluons create gravity fields acting in reciprocity with remote tetron pairs. In contrast, +/- 1/2 spin leptons produce exactly the same spin as they consume.

The photon's charge becomes materialized as an electromagnetic wave as shown in the following diagram. Note the EM wave's components of alternating charge and alternating magnetism.

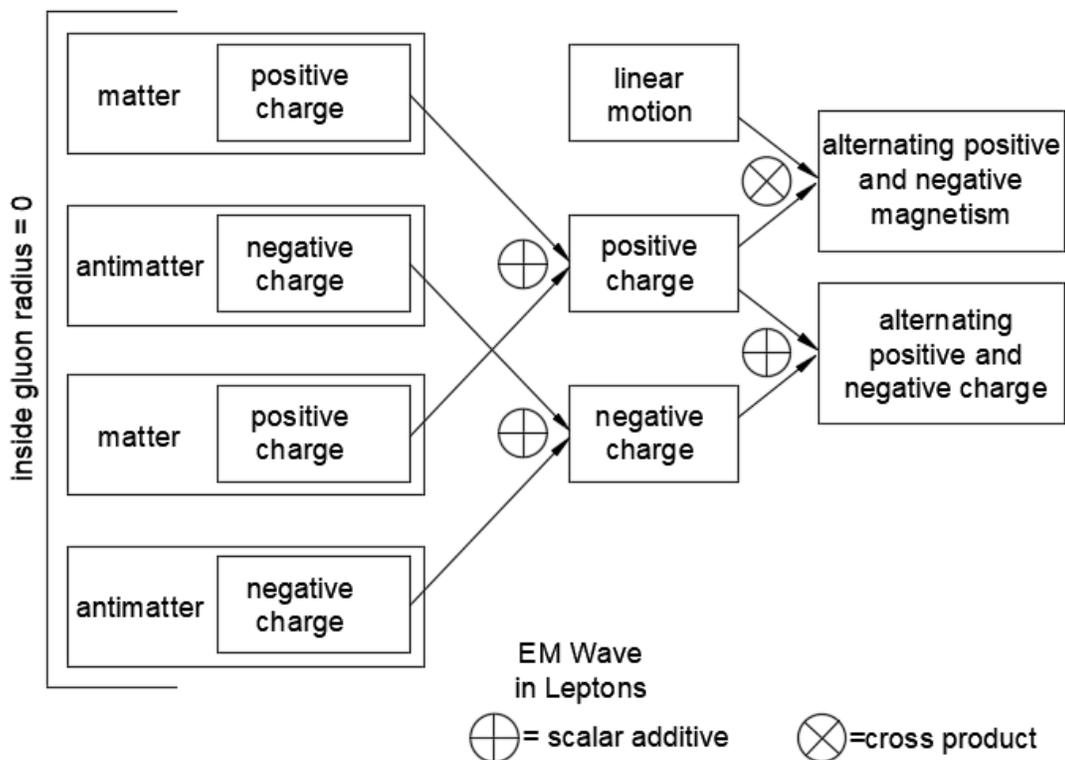


Figure 9 - How Charge Creates the Lepton EM Wave

Neutrinos have the same propagation as photons and have matter//antimatter pairs of particles. The difference is they propagate by spin alone and not with charge. Neutrinos do not form into a complex of four particles as in the photon because they don't have electron shells to go into and come out from where the opposite spin electrons go into transverse orbits. That means neutrinos do not have the polarity that photons do and don't have the Pauli exclusion principle to obey.