

Photon Polarity

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Abstract

The two polarities of light are due to the electron and positron spins that make up the photon

Keywords

Photon polarity, electron spin, positron spin

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Claims of Novelty

- Two new quarks and their anti-quarks are components of leptons.
- Electron plus and minus spins are the two polarities of light.

Chapter 2 Introduction

Dedication

This work is dedicated to Ginger

Chapter 3 The Photon

Components of the Photon Polarity Pair

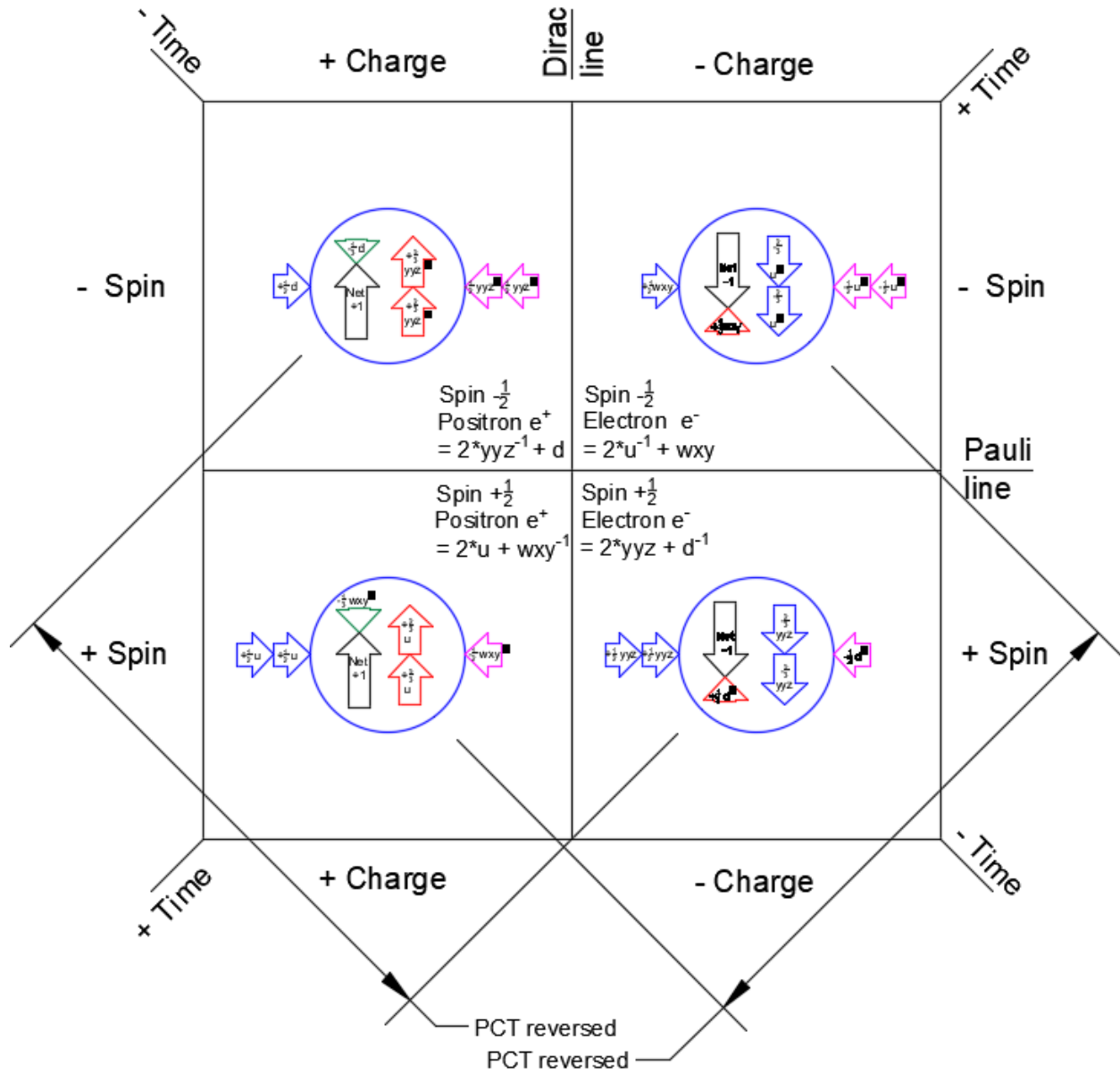


Figure 1 - Components of the Photon Polarity Pair

Quarks in a Photon

Photon polarity is equivalent to electron spin. An unpolarized photon is a mixture of left and right polarized half photons.

Arrangement

There is only one possible arrangement of the right polarity photon, with the 2 u quarks matching the 2 y quarks and the one d⁻¹ quark matching the one wxy⁻¹ quark.

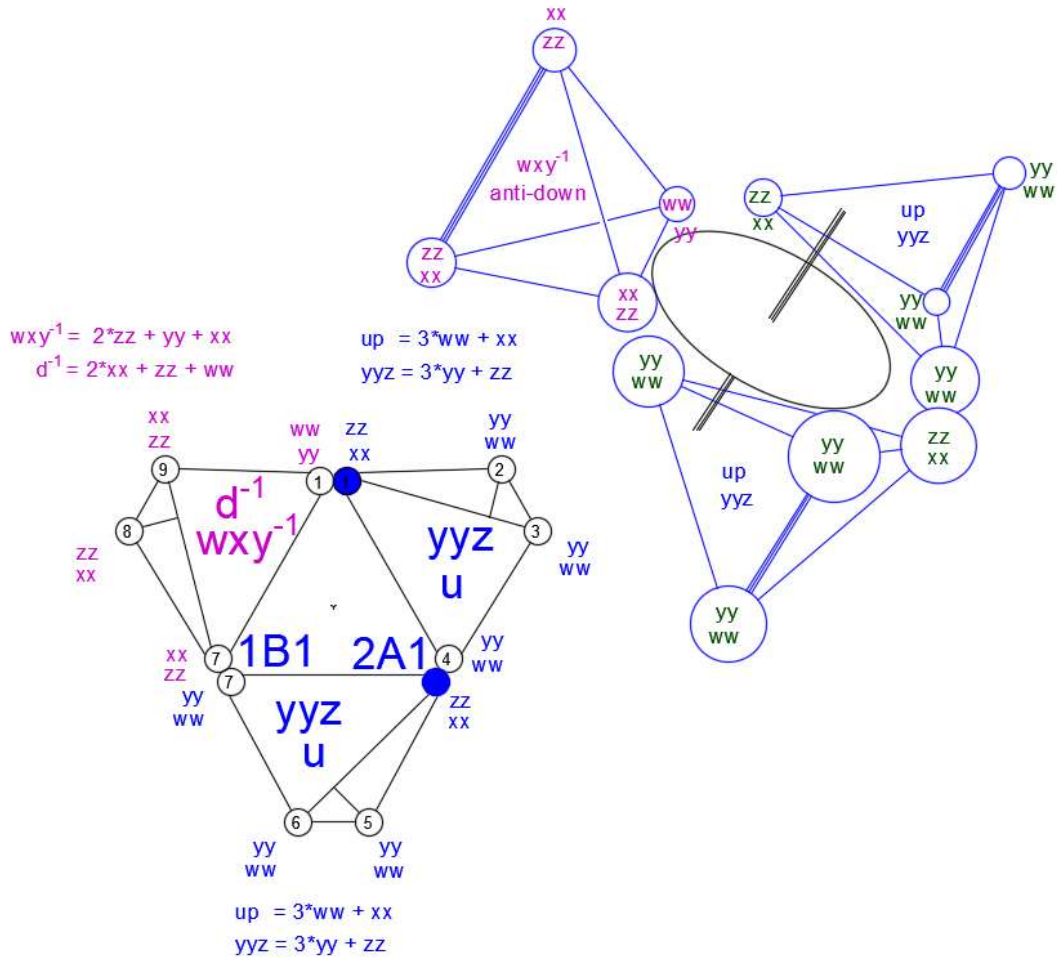


Figure 2 - Model of a Right Polarity Photon

Left Polarity Photon

Model of a left polarity photon χ_L , which is a -1/2 spin electron and a -1/2 spin positron occupying the

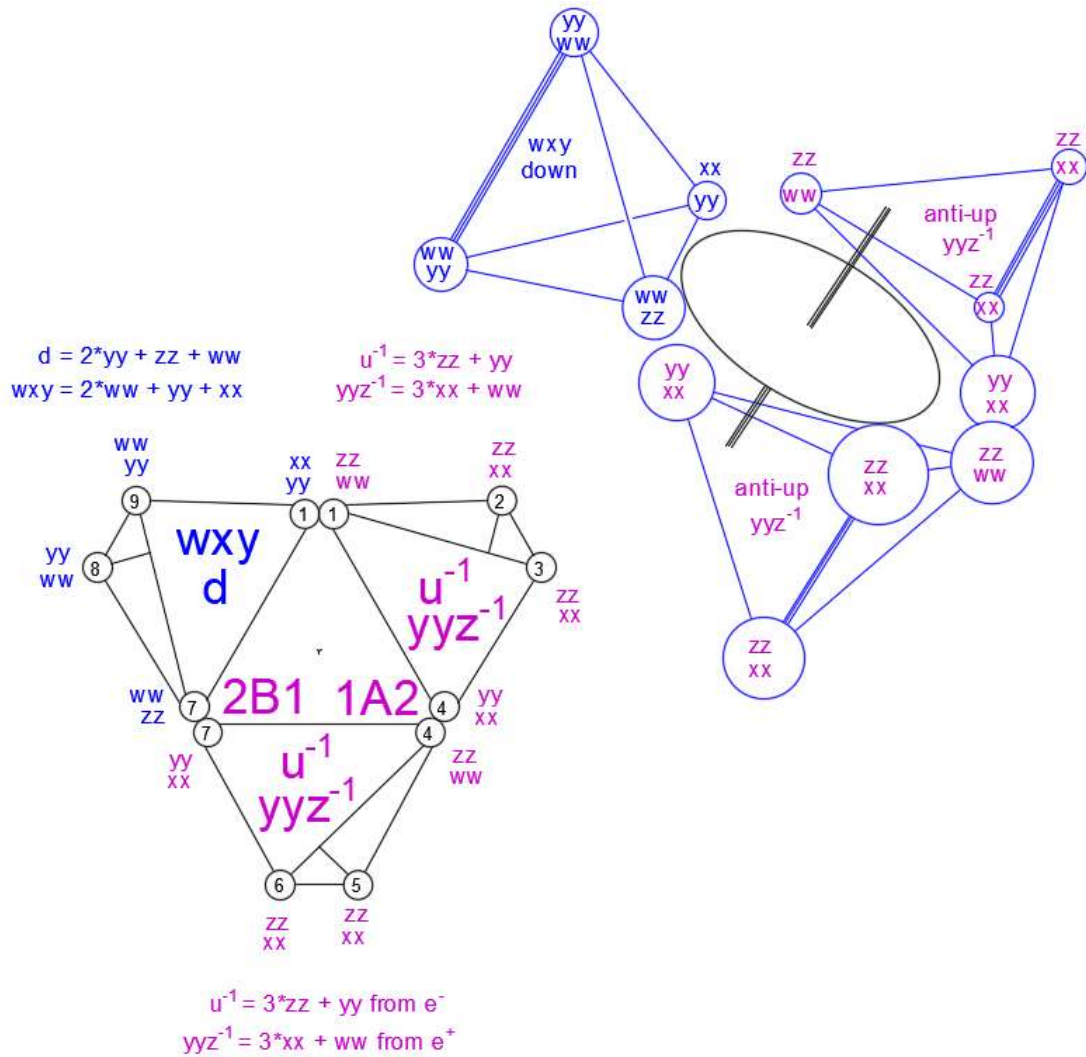


Figure 3 - Model of a Left Polarity Photon

Pictorial of the Photon

Left + right polarity photon = un-polarized photon. Un-polarized photon is spin and charge balanced, so is unaffected by gravity, magnetism or charge. Six spin-pair bound tetrons are in the binding plane, and are of opposite spin, considered to be held in spin abeyance as potential energy. Each quark of a fermion has 2 spin-pair bound tetrons. These 2 tetrons are in an interior corner of the quark, lie on the quark plane, and are bound to a neighbor quark's tetron.

The spin-pair binding energy between quarks could be considered to be a 'gluon' of binding energy. All 3 generations of fermions (matter and antimatter) have 3 quarks of this same structure. The spins of the 4 tetrons in each quark tetrahedron are parallel and sum $1/4 + 1/4 + 1/4 - 1/4 = -1/2$. The exterior spin axes of the 3 pairs of un-bound tetrons are parallel and sum $1/2 - 1/2 - 1/2 = -1/2$.

Unpolarized Photon

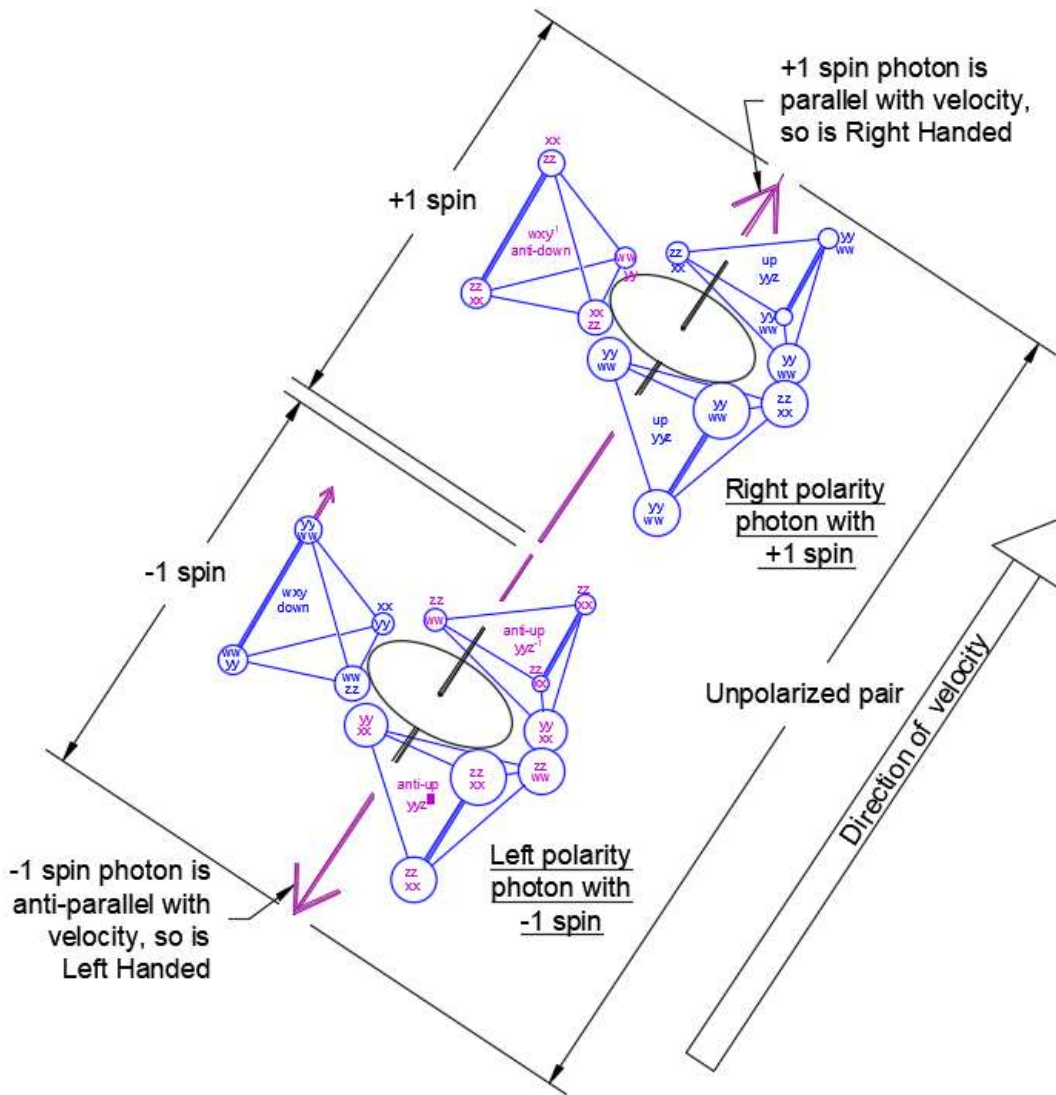


Figure 4 - Unpolarized Photon

Two Polarities of Photon as Isometric Symbols

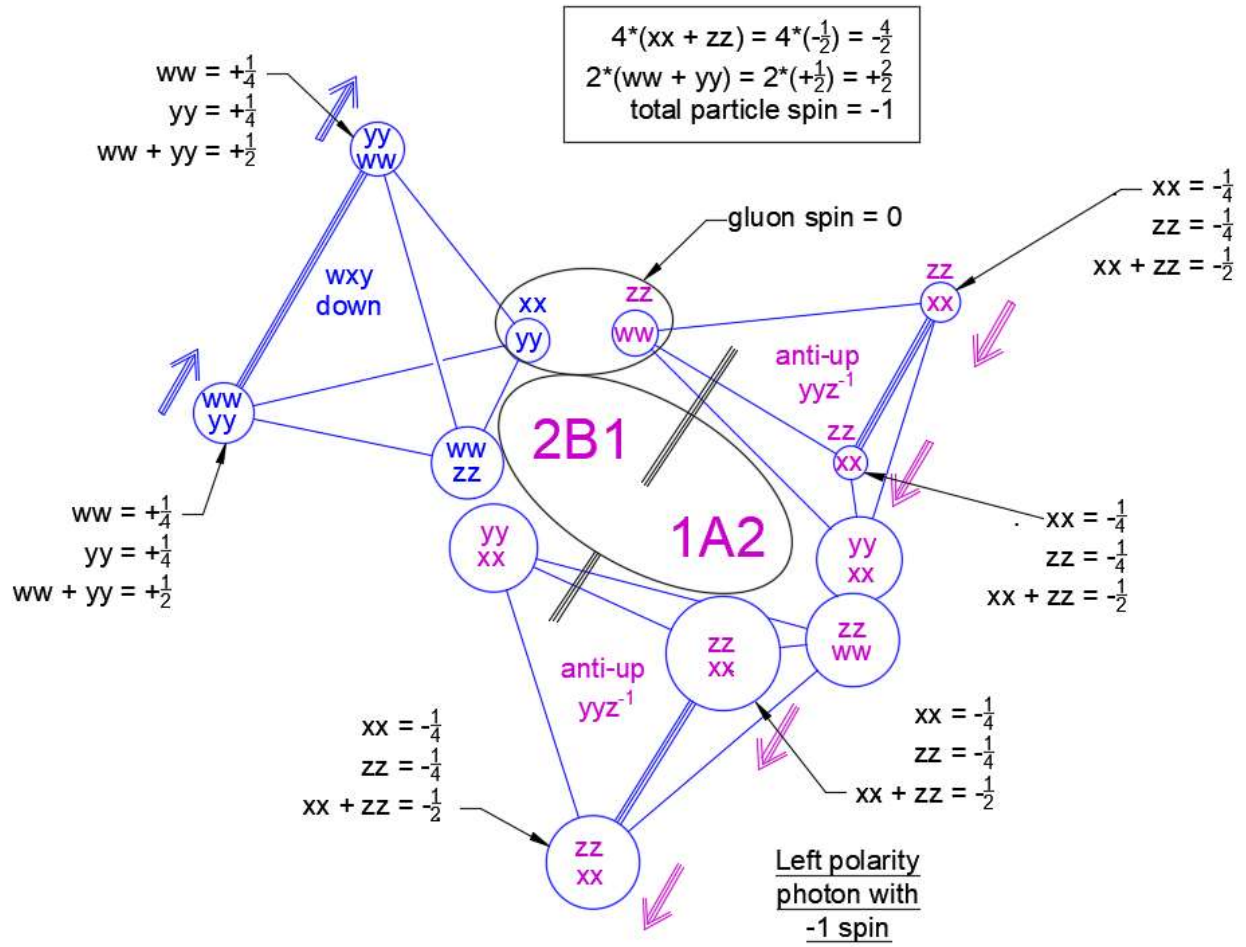


Figure 5 – Left Polarity Photon with -1 Spin

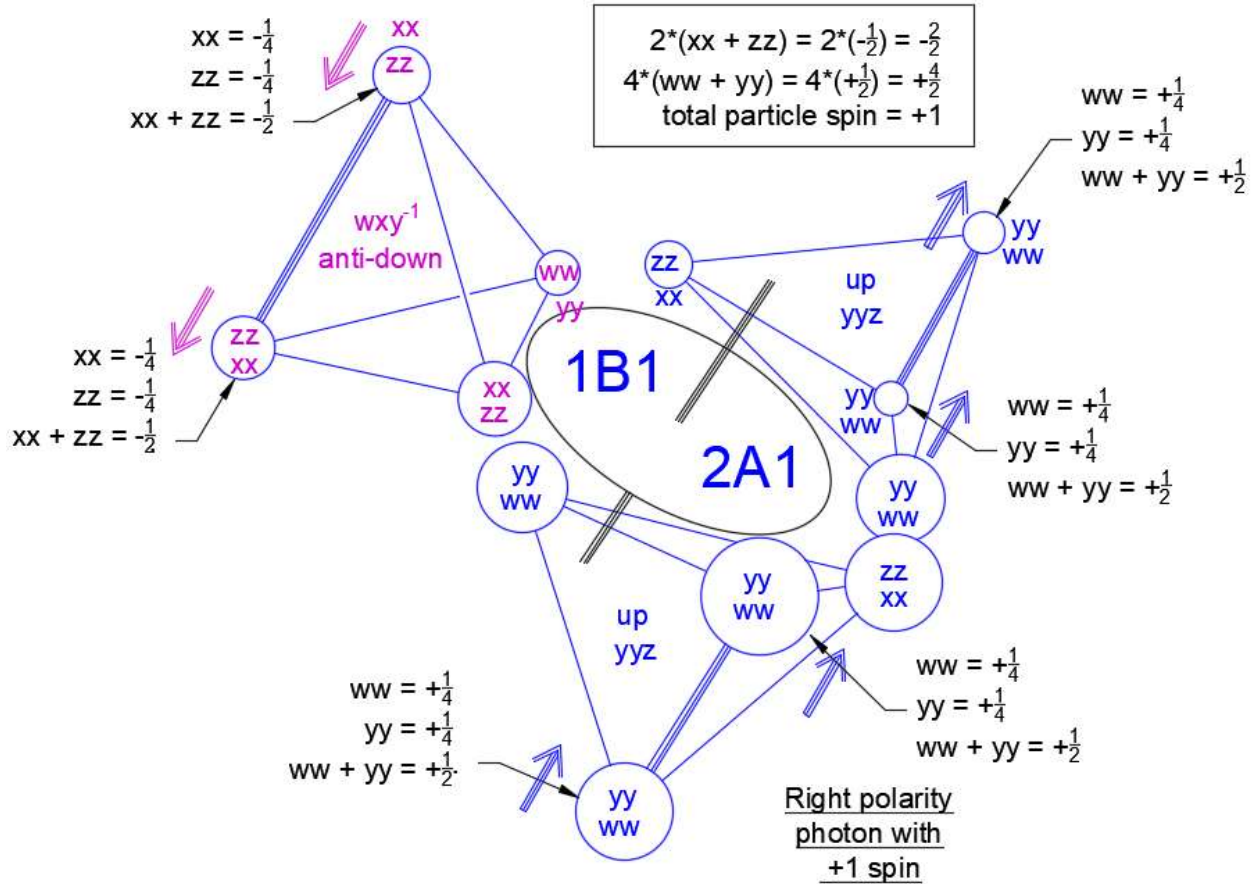


Figure 6 – Right Polarity Photon w/ +1 Spin

Electron Emits as a Photon

The spin +1/2 positron occupies half of the +1/2 spin space in a shell. The spin +1/2 electron occupies the other half of the +1/2 spin space in s1 shell. In the shell, the electron and positron form a pair as congruent PCT opposites.

Photon Leaves the Shell

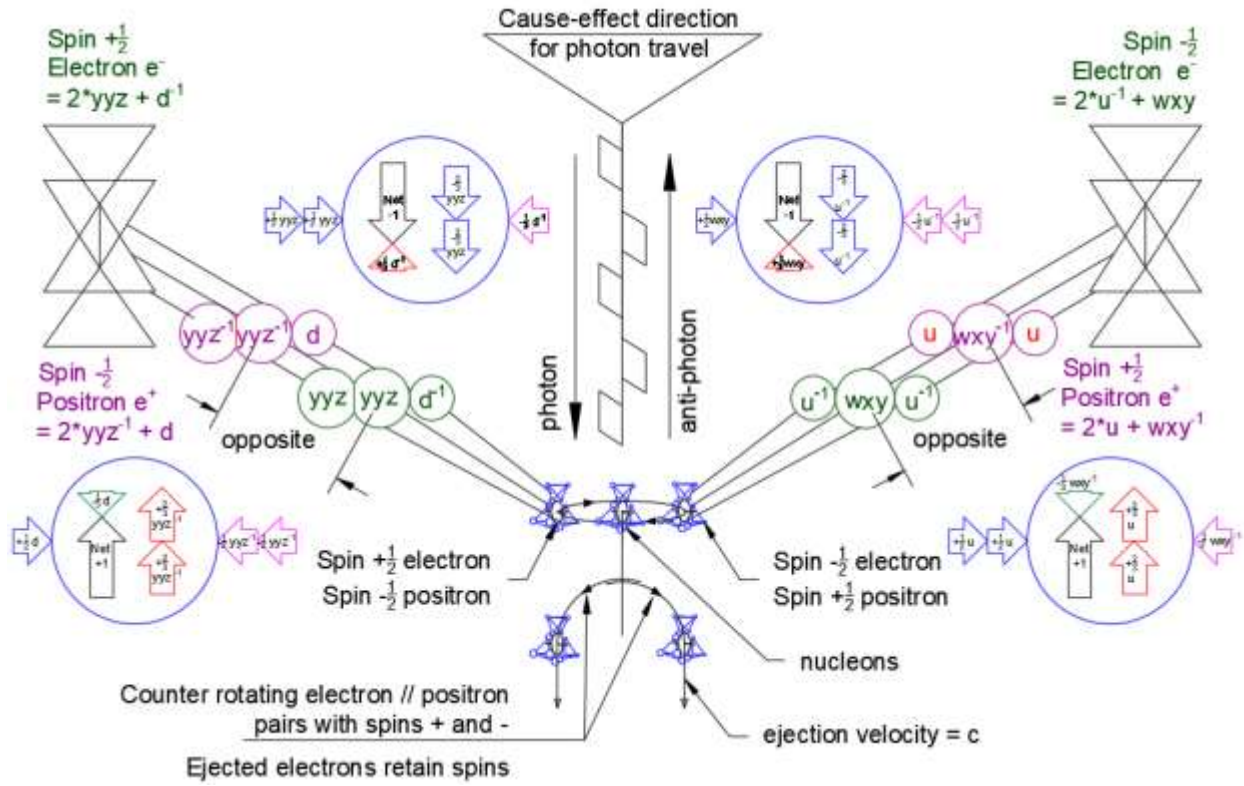


Figure 7 - Photon Leaves the Shell

Electrons and Positrons Combine to Form Photon Halves

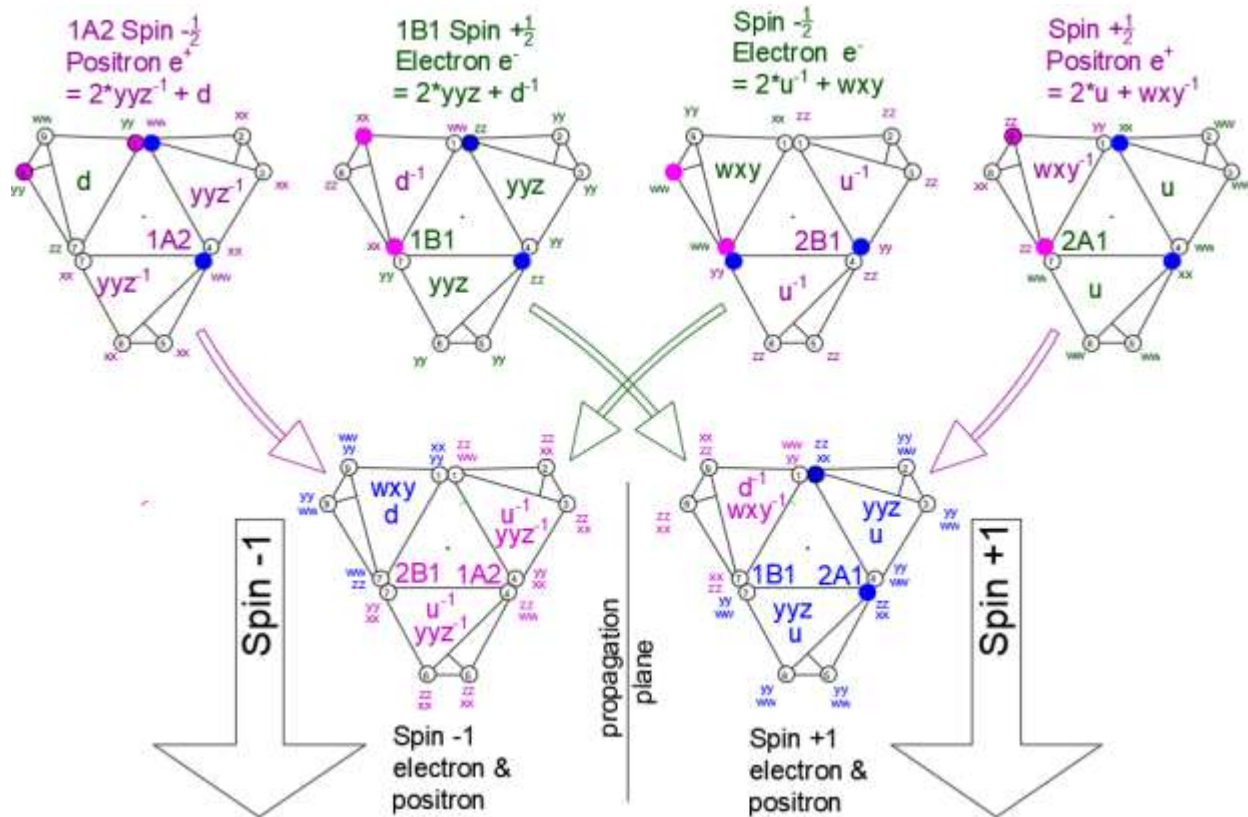


Figure 8 - Electrons and Positrons Combine to Form Photon Halves

Separated Pair of Mutually Rotating and Attracting Particles

The iso-spin of positive and negative spin is balanced. The centripetal force of each spin side separately balances its half of the 'strong force' spin reduction energy. The 'strong force', which would be spin reduction energy if it were stationary like a fermion nucleus, is what keeps velocity going in a photon. Centripetal force in an orbiting electron is linear force in a tangent direction. The distance between the electron and positron in a matter/antimatter pair collapses to zero and the circular motion is converted at the tangent point to linear motion. The tangential velocity of the lowest electron level is always c. All entrances and exits of the photon to and from the atom are via the lowest level s orbit.

Outside the shell, the same spin electron and positron form a separated pair of mutually rotating and attracting particles. Photons move for the same reasons mass particles move - they are going down the energy level gradient. A photon by itself creates a moving curvature of space, which it follows. After photon passage, the space curvature returns to its previous state.

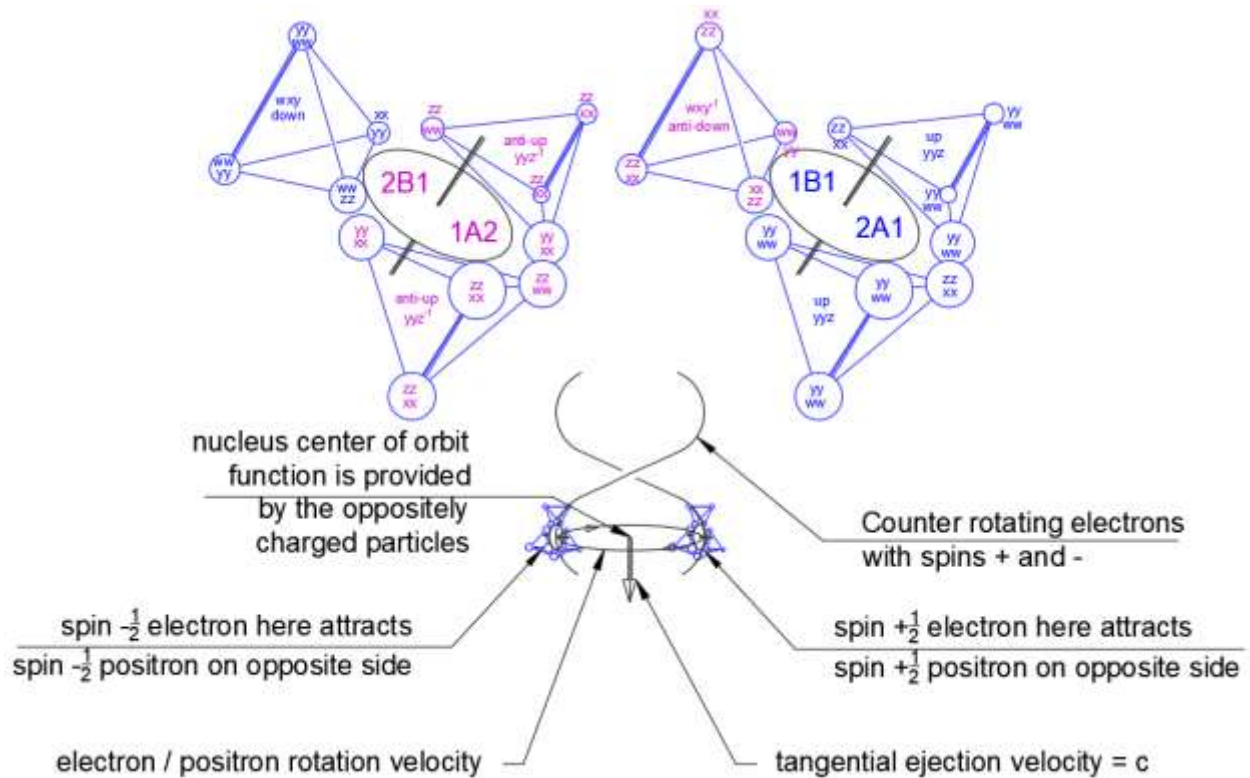


Figure 9 - Separated Pair of Mutually Rotating and Attracting Particles

Congruence of Pairs Stay Together

A matter observer sees a minus charge electron in an atom having electrostatic attraction to a positive charge proton. An antimatter observer sees a plus charge positron in an atom having electrostatic attraction to a negatively charged anti-proton. The matter and antimatter observers are congruent. The orbiting electron and positron are congruent. The proton and anti-proton are congruent.

The following orbiting and traveling electron diagrams are the condition of two electrons in a spherical shell. If only one electron is in the shell, it will exit the shell as a polarized half photon. There is a statistical tie of polarities of photons leaving the atoms in a bulk of material because neither spin electron will exit first preferentially.

Orbiting Electron

While orbiting in a spherical shell, electron and positron are PCT opposites. The matter observer only sees plus spin ($2*yyz + d^{-1}$) electron and ($2*u + wxy^{-1}$) positron. The invisible minus spin ($2*yyz^{-1} + d$) positron and ($2*u^{-1} + wxy$) electron remain congruent with their plus spin pair partners.

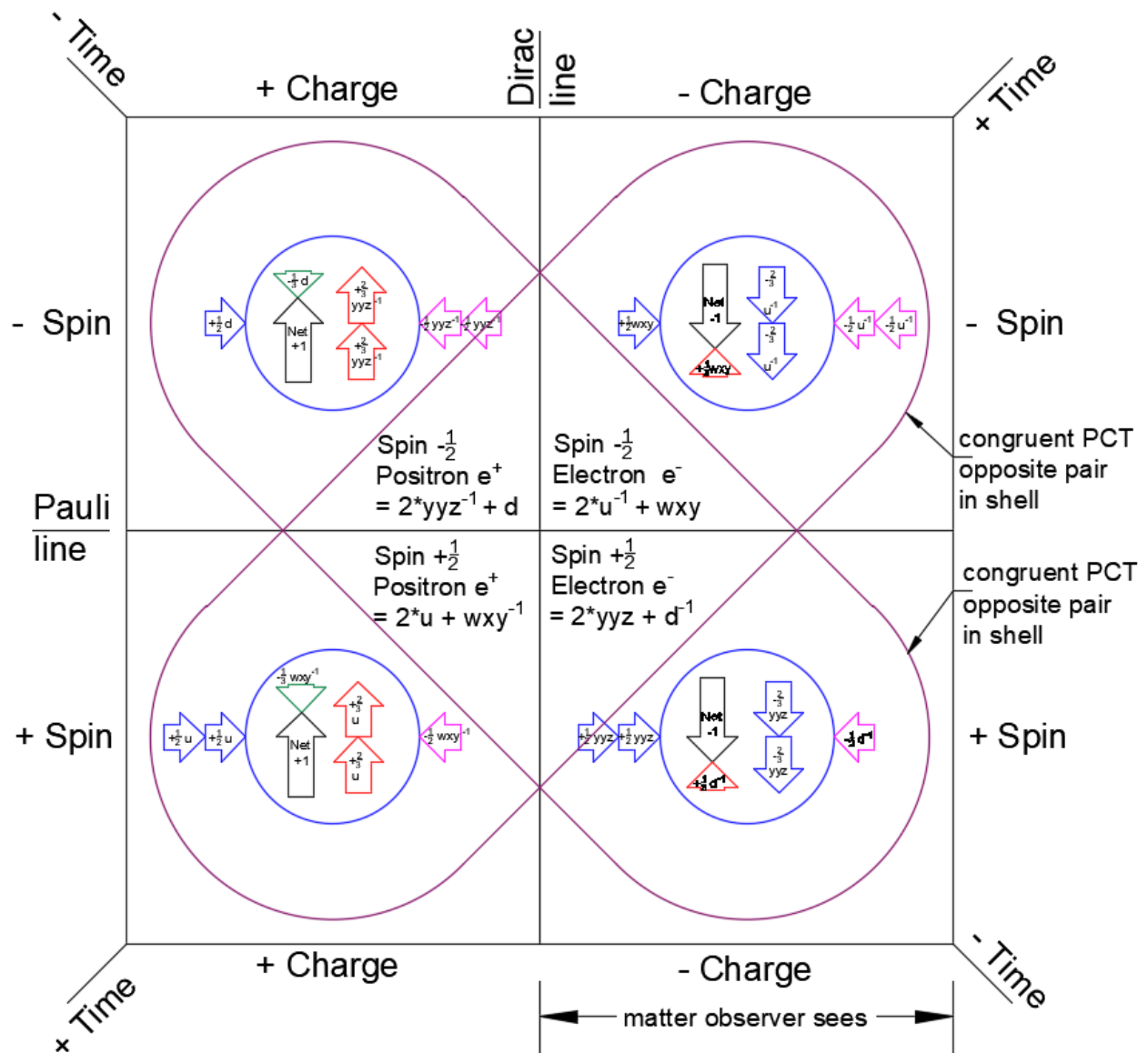


Figure 10 - Orbiting Electron

Traveling Electron

While traveling in a straight line as a photon, electron and positron are PCT opposites. The matter observer only sees plus spin entities like the $(2 * yyz + d^{-1})$ electron and the $(2 * u + wxy^{-1})$ positron. The invisible minus spin entities like the $(2 * yyz^{-1} + d)$ positron and the $(2 * u^{-1} + wxy)$ electron remain congruent with their plus spin pair partners.

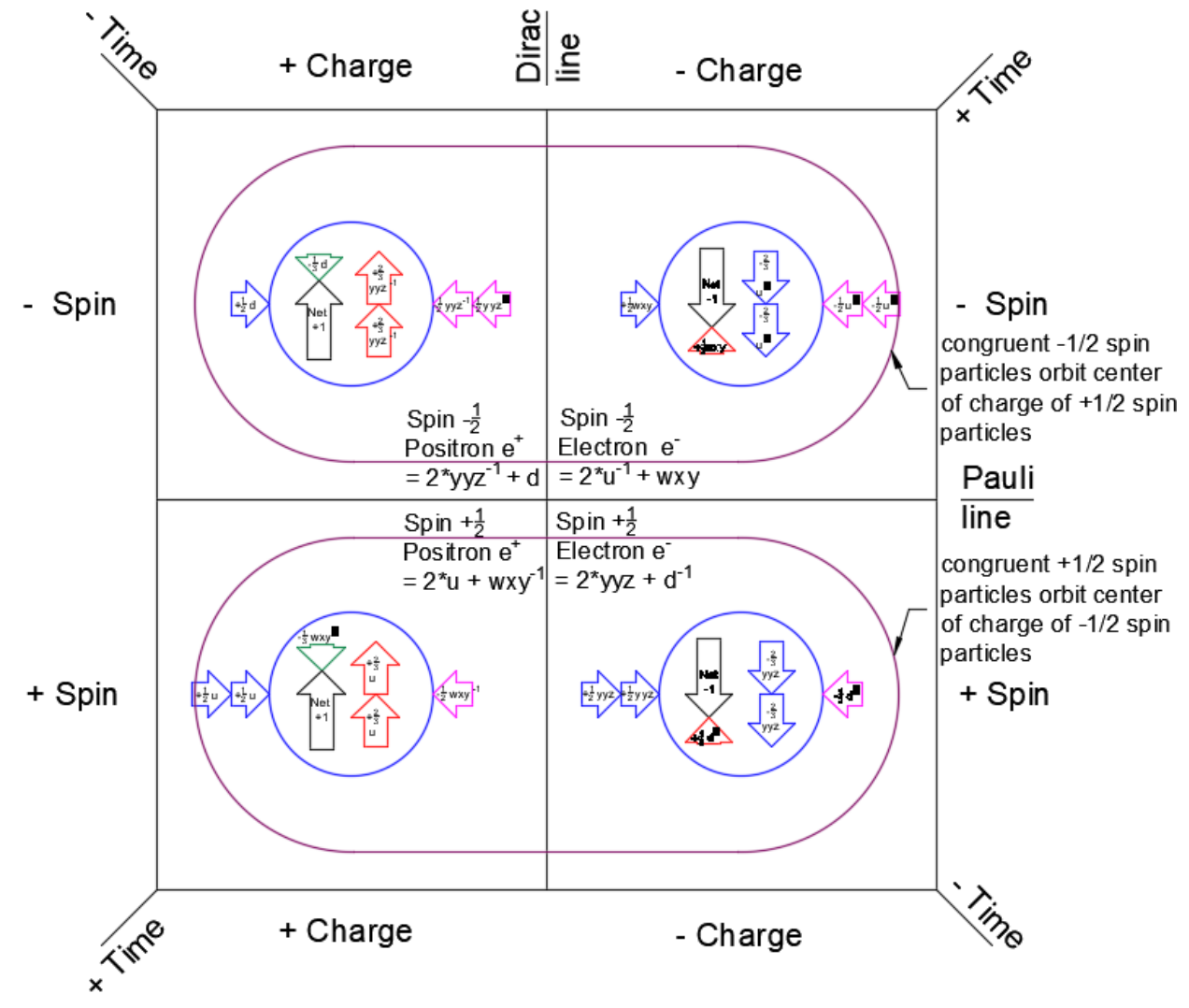


Figure 11 - Traveling Electron

Photon Outside the Ionized Helium-4 Atom

Co-rotating polarized photon halves have the same mutual opposite charge attraction between electron and positron as a complete photon with both halves.

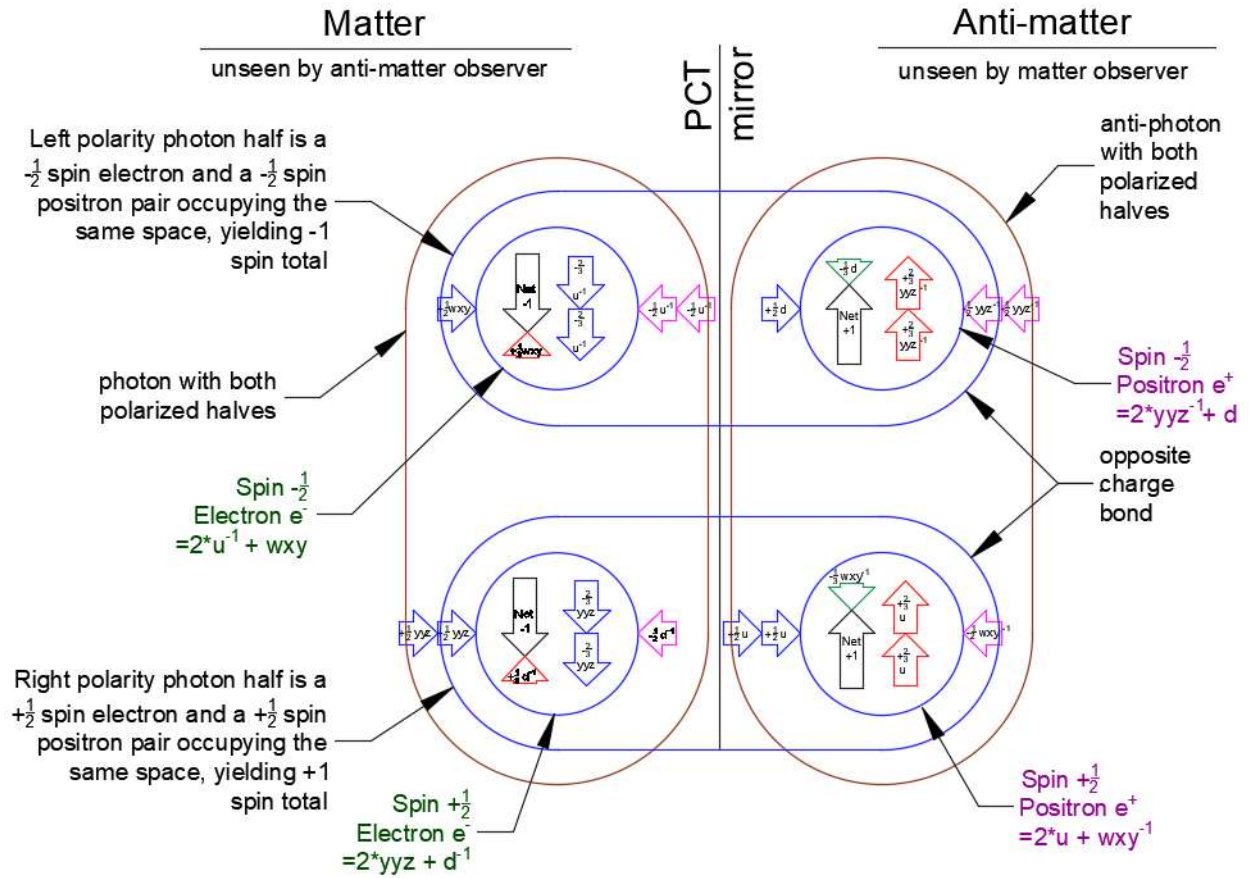


Figure 12 - Photon Outside the Ionized Helium-4 Atom

Electron and Positron Exit and Entry to/from a Shell

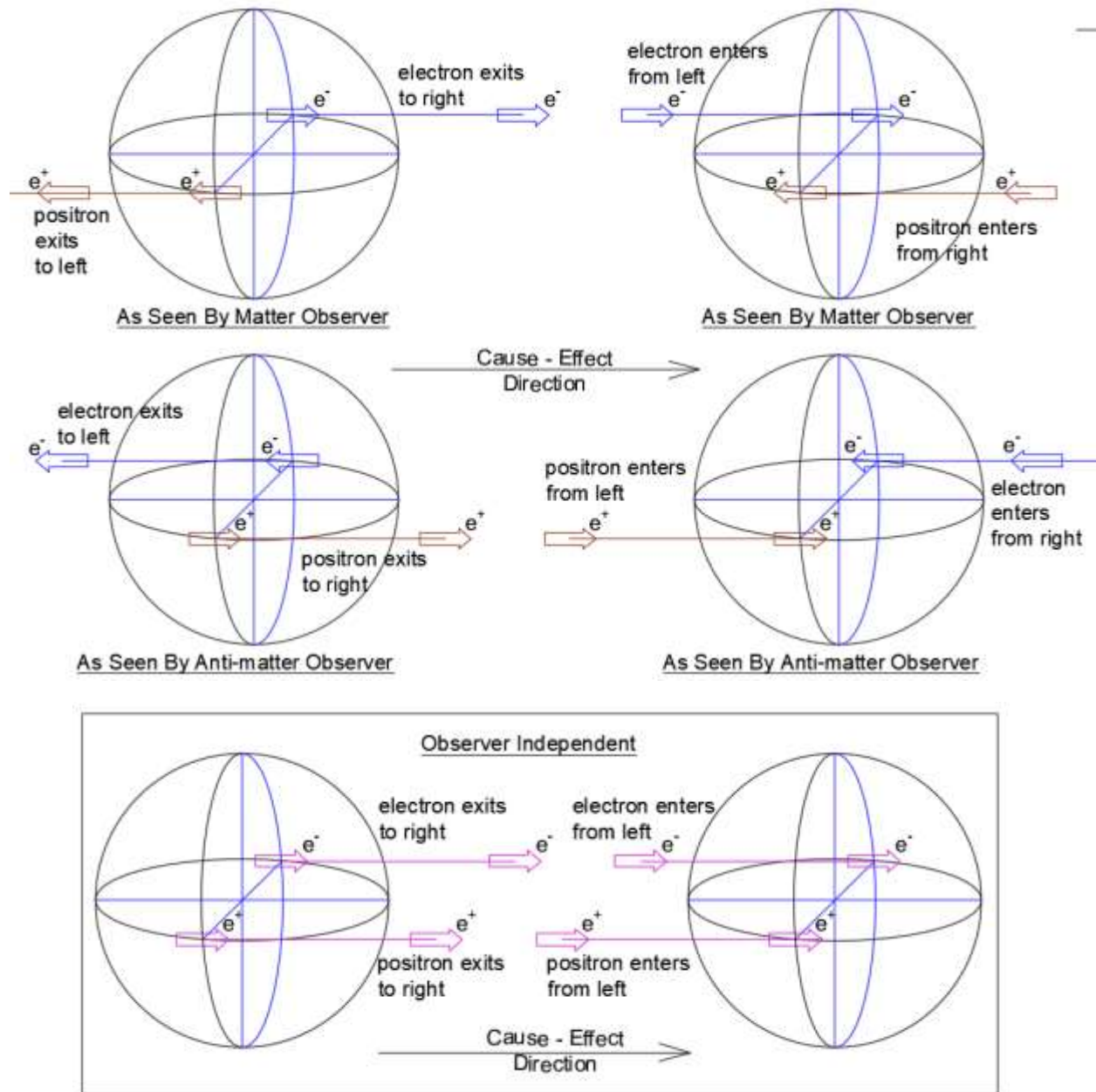


Figure 2 - Electron and Positron Exit and Entry to/from s_1 Shell

Electron and Positron Rotation in Shell

Phrases such as, "electron rotates CW..." means angular rotation. Differentiate rotation from iso-spin such as, "...positron is iso-spin -1/2...". The point of this diagram is that no collision is possible between the rotating electron and positron because they exist in different spin spaces (positive and negative).

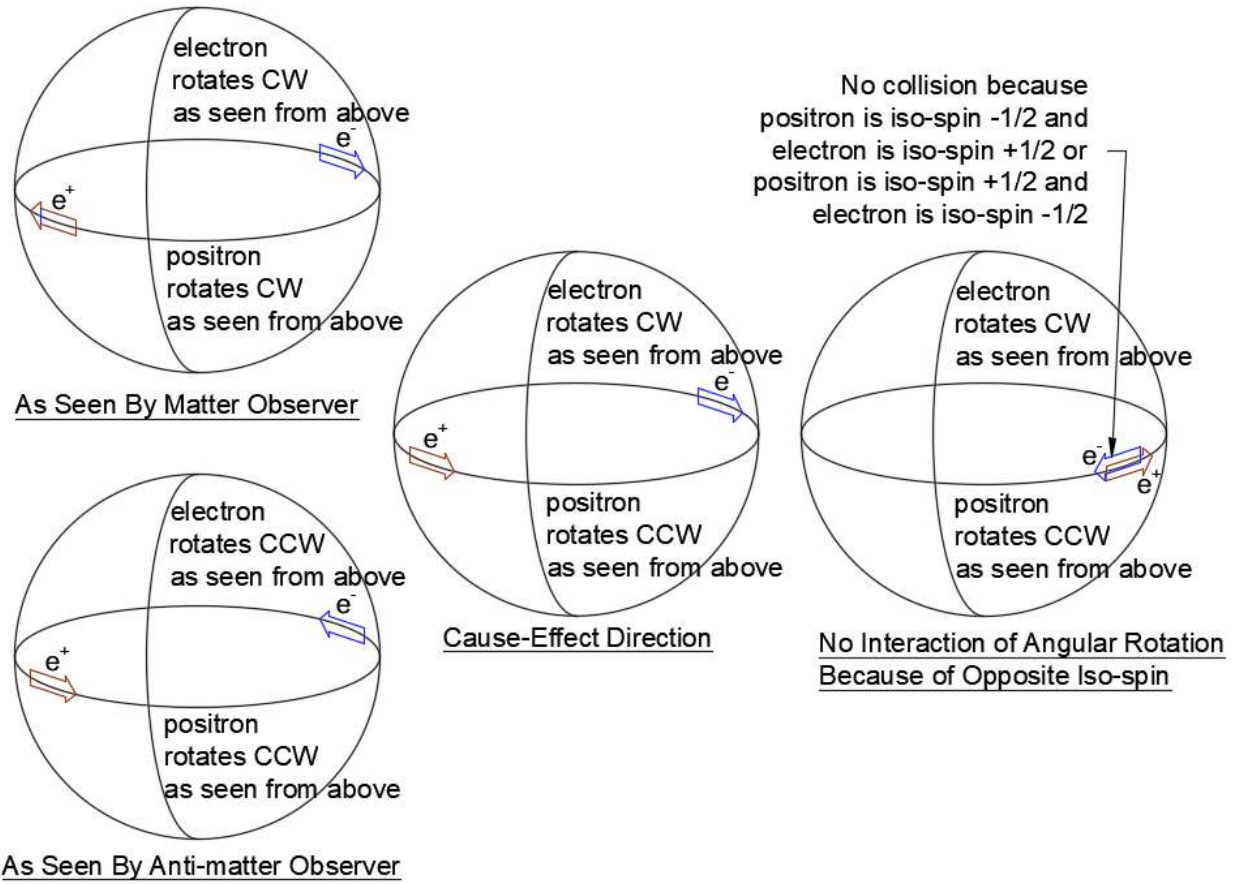


Figure 3 - Electron and Positron Rotation in s1 Shell

Photons Have Constant Velocity, But Different Energy

Electron Orbit Precession

Precession of the polar and equatorial orbits are proportional, and are proportional to the energy of the electron // positron pair. The word “precession” is used without identifying both necessary vectors for precession as in a gyroscope. Only the polar or equatorial circular path is given, which gives one of the two vectors necessary. The second vector is postulated but unidentified as to source.

The energy carried in the photon as measured by its frequency is conferred by the precession of the electron//positron pair’s orbit. Not angular momentum orbit which can have any value. Isospin orbit which has unit value. The isospin orbit is unit value of c velocity at the tangent. The isospin orbit’s precession makes a cross product with the other electron’s isospin precession to create energy. Frequency energy.

The spherical shell is shown, but electron shells have a number of different shapes and represent

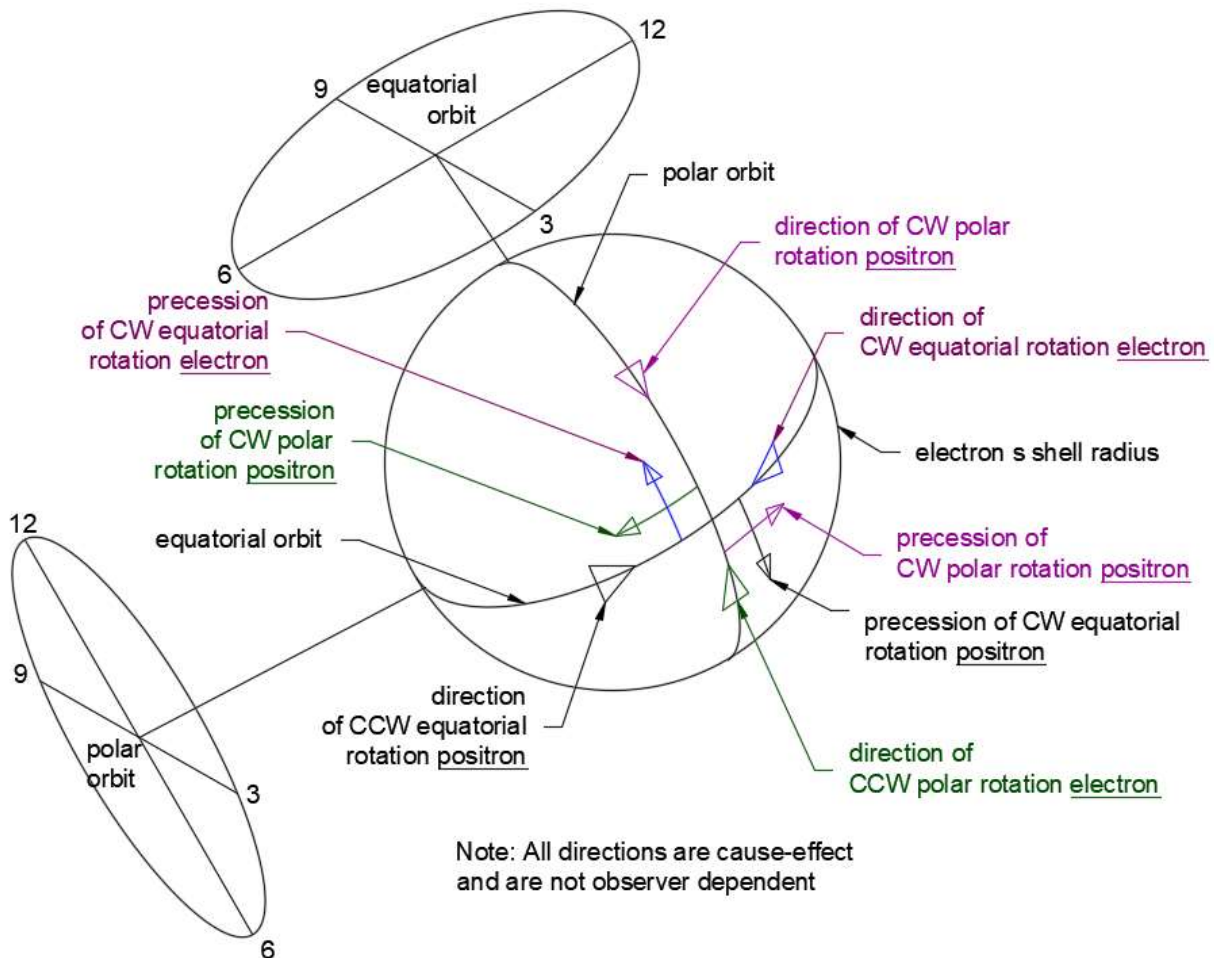


Figure 4 - Electron Orbit Precession

Traveling Photon

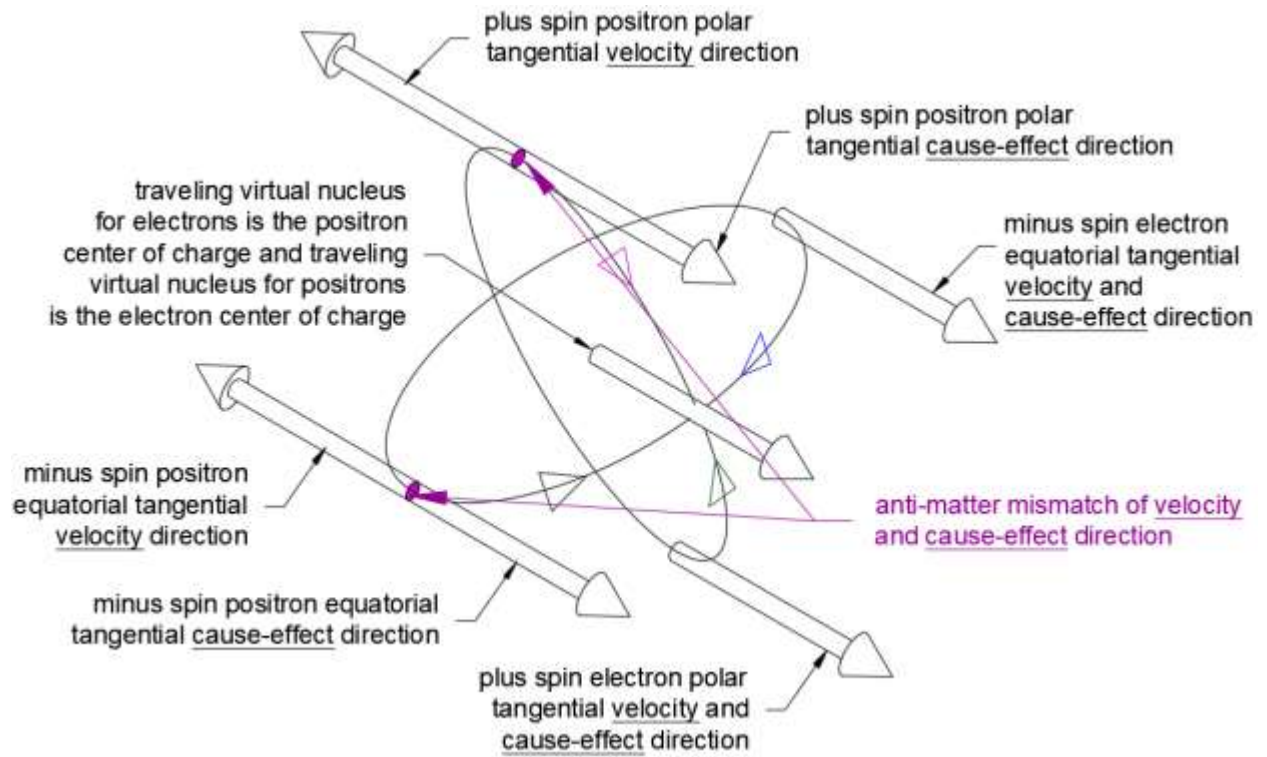


Figure 5 - Traveling Photon

Phase Shifted Sine Waves

Orthogonal circular orbits and quarter wave phase shift keeps electron and positron pairs with plus and minus spin separate.

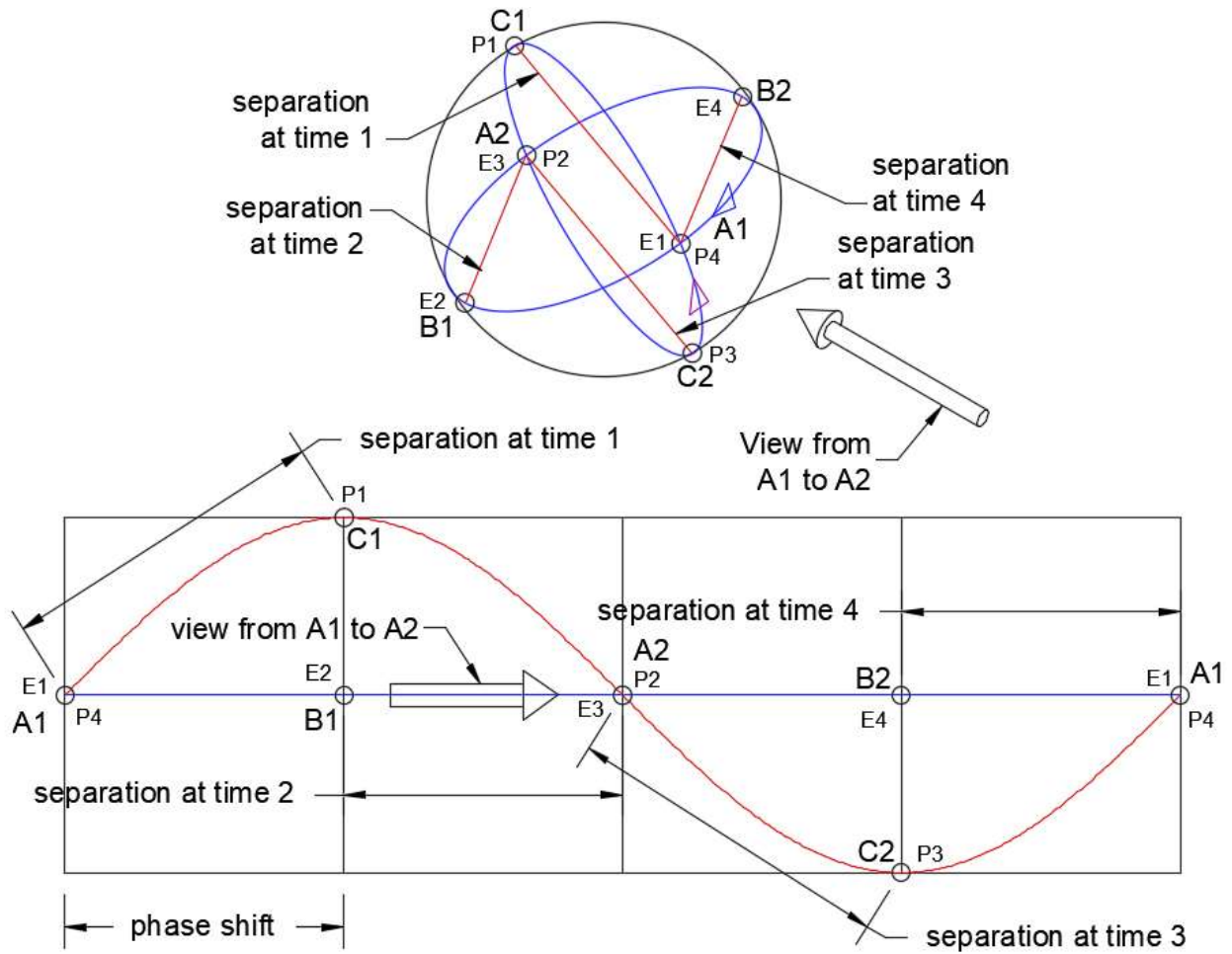


Figure 17- Phase Shifted Sine Waves

Photoelectric Effect as Seen by Matter Observer

- Spin +1/2 electron and positron orbit on opposite sides of the polar orbit.
- Spin -1/2 electron and positron orbit on opposite sides of the equatorial orbit.

Electron and positron cause-effect rotations are opposite in orbit and the same linear direction when exiting / entering the electron shell.

- Electron velocity directions are the same as cause-effect directions.
- Positron velocity directions are opposite from cause-effect directions.

A matter observer sees matter cause-effect direction the same as velocity direction and antimatter cause-effect direction opposite from velocity direction. An antimatter observer sees antimatter cause-effect direction the same as velocity direction and matter cause-effect direction opposite from velocity direction. Both observers see what they are made of with cause-effect direction the same as velocity direction. This allows both observers to be the same observer.

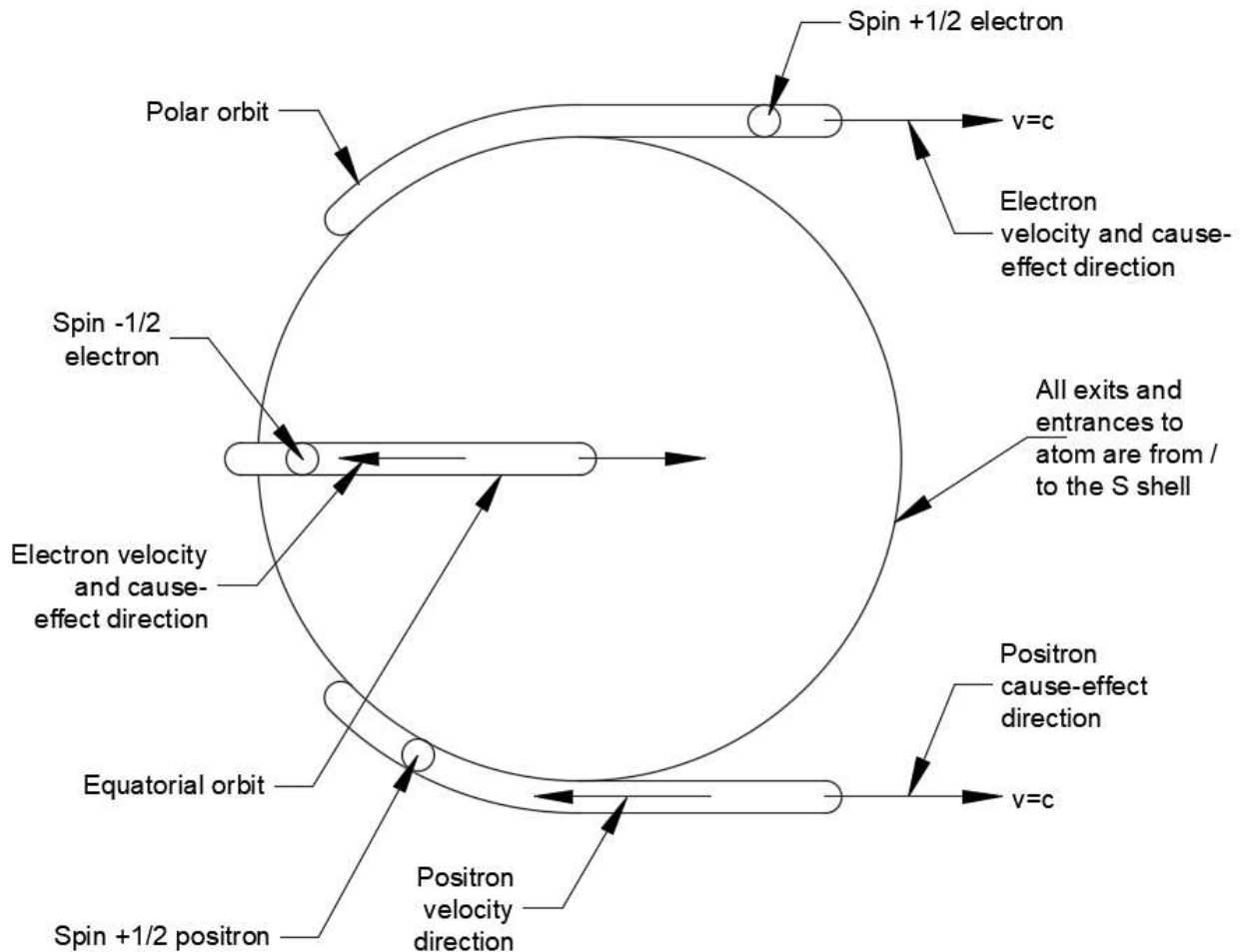


Figure 6 - Photoelectric Effect as Seen by Matter Observer

Particle Nature of Light and Wave Nature of Matter

The major spin precessions of the electron's spins form a cross product " $v \times v$ " that is frequency of light " f ". This diagram is analogous to the gluon because of opposite spins.

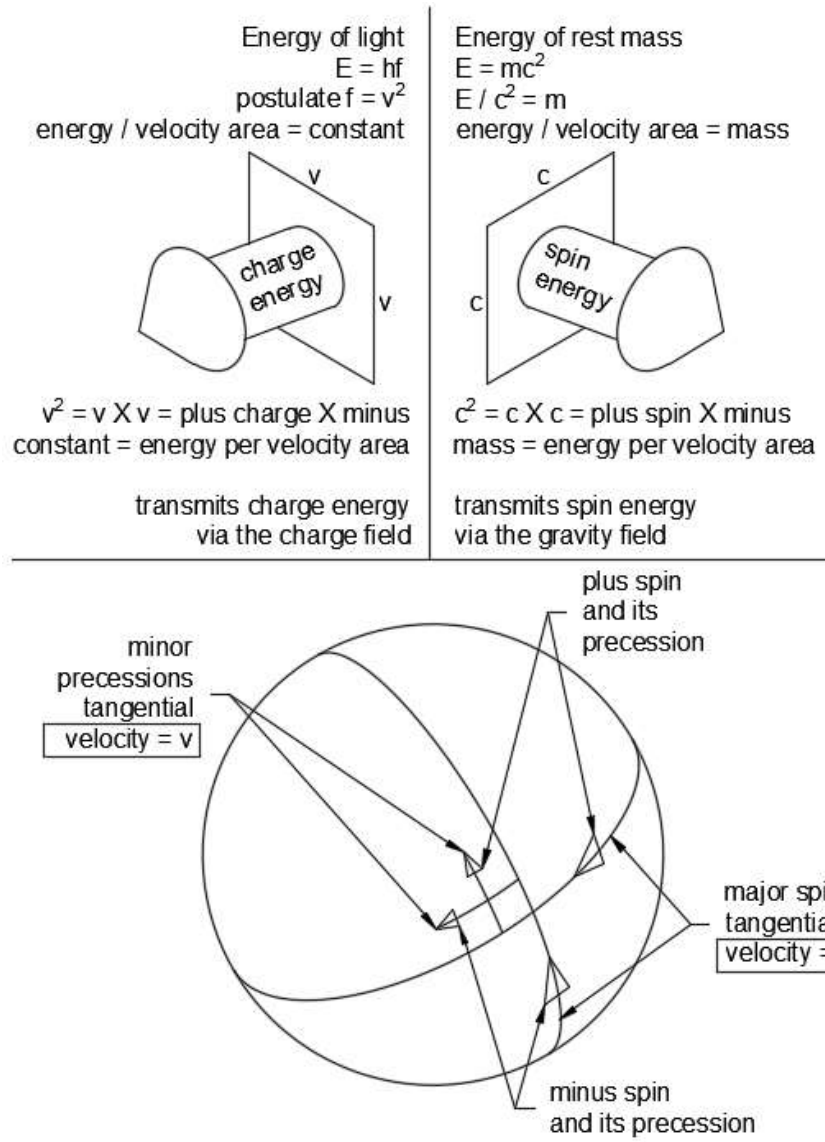


Figure 7 - Particle Nature of Light and Wave Nature of Matter