Tetrons, Antimatter and Redshift

John Caywood

ABSTRACT

Four tetrons make matter and anti-matter. Quarks are tetrahedrons with a tetron at each vertex. Besides two-quark mesons, three-quark particles form baryons and leptons. Two new quarks and their anti-quarks are components of leptons. Beta decay is a misinterpretation of the beta reaction because antimatter velocity is opposite of cause-effect velocity. Helium-4 nucleus is shown with the six attachment points for added neutrons and four attachment points for added protons, which matches the known isotopes of helium. Electrons and positrons exit from the spherical shell of the atom. Electron plus and minus spins are the two polarities of light. Lorentz formulas are modified to become Lorentz-Pythagorean circles with half for matter and half for antimatter. All matter has parity, charge and time reversed antimatter coexisting congruently with it. Two nested half sphere universes exist. One is dominated by matter and the other is dominated by antimatter. The strong force present in the gluon is the cancellation of iso spin in the four tetrons in a gluon. Energy removed from iso spin cancellation is stored as curvature of space, which creates gravity. History of time passage is different from rate of time passage. Varying rates of time passage for an object accumulate to its history of time passage. Redshift of distant objects is an artifact of the observer being in space rotated with respect to the space wherein the photon was created. The uncertainty of one photon going thru two slits is explained by considering the congruent anti-photon going backwards in its time.

Keywords: *Special Relativity; General Relativity; Lorentz; Length Contraction; Time Dilation; Beta Decay; Quark; Red Shift; Antimatter; Uncertainty; Gravity*

INTRODUCTION

The spin, charge and time are the root unit rotations which exist at the universe center and connect all points in the universe. The 3D distance from every 3D point to the universe center is zero, but the angular separation of all 3D points is measured from the universe center.

• Four tetrons are neither matter nor antimatter, but make all matter and antimatter. They are the permutations without repetition of unit spin, charge and time such that the mutual cross products: time X spin=charge, spin X charge=time and charge X time=spin.

• Quarks are tetrahedrons with a tetron at each vertex. Each quark has a congruent anti-quark PCT opposite with PCT opposite tetrons at each vertex.

• All particles have Parity, Charge And Time (PCT) reversed antiparticles coexisting congruently in macroscopic time and oscillate between matter and antimatter in a quantum period

• All reactions have congruent PCT reversed particles and motions.

• Lorentz time dilation and length contraction equations are written as squares of velocities. Taking the square root of the equations reveal negative velocities which go with positive velocities.

• Three quarks form most particles, including leptons. Three-quark particles have three quarks arranged in a triangle with gluons at the three central vertices of each quark.

• Two-quark particles have a congruent matter quark and its antimatter quark in each of the two positions.

• Two new quarks and their anti-quarks are components of leptons.

• Two nested half sphere universes exist. One is matter and the other is antimatter.

• The weak force does not exist. Beta decay is a misinterpretation of the beta reaction because antimatter velocity is opposite of its cause-effect velocity.

• Helium-4 nucleus has six specific attachment points for added neutrons and four specific attachment points for added protons.

• Electron plus and minus spins are the two polarities of light.

• When antimatter particles are visible, their matter pair half becomes invisible.

• The "strong force" present in the gluon is the cancellation of iso spin in the four tetrons in a gluon. Energy from the iso spin becomes a spin field. This spin field is recognized as a gravitational field when tetrons respond to it.

• A unit of spin field is the cross product of a unit of plus spin and a

Independent Researcher, 3719 Deedham Dr, San Jose, CA 95148, USA

Correspondence: John Caywood, Independent Researcher, 3719 Deedham Dr, San Jose, CA 95148, USA, e-mail john_caywood@hotmail.com

unit of minus spin.

• Each tetron's unit spin reacts to the unit spin field or unit anti-gravity field. Response to anti-gravity is time reversed, so the net cause-effect response gravity appears to be one directional.

• Unit gravity explains the Galileo gravity experiment, because the creation of a gravity field is treated separately from the response to the gravity field.

• History of time passage is different from rate of time passage.

• Varying rates of time occur as an object accumulates its elapsed time history.

• Redshift of distant objects is due to time dilation between the observer and the observed space rotated with respect to the space wherein the photon was created.

• There is no age difference in the twin paradox because time dilation is reciprocal between observer and observed. The observed time rates and the accumulated elapsed time return to being the same as the earthbound twin when velocity stops.

• General relativity has nothing to do with distance or gravity. It has to do with separating time rate and elapsed time, which have a reciprocal relationship.

• The uncertainty of one photon going thru two slits is explained by considering the congruent anti-photon going backwards in its time and the electric fields the emitting and absorbing electron shells have.

• Cause-effect direction is the same as matter velocity direction. Cause-effect direction is opposite of antimatter velocity direction. Without congruent matter and antimatter, cause-effect cannot occur.

• The half fractional matter cause-effect dimension combines with the half fractional antimatter cause-effect direction to make a unified cause-effect dimension where entropy has many states but not a time direction.

• The mass difference between the neutron and proton is due to 2 tetron pairs on the neutron that are in a gluon connecting it to the remainder of the nucleus compared to 1 tetron pair on the proton that is in a gluon connecting it to the remainder of the nucleus. Because the extra tetron pair on the neutron has opposite spins that cross to create a spin field. When this created spin field is reacted to with a receiving tetron's spin, it is perceived as a gravity field and weighs more.

• The Equivalence Principle states that slowing of the time rate of an object is the same, whether it is accelerated by gravity or a mechanical means. This is only true at the tetron level, because when a loosely connected system of various components and linkages is accelerated mechanically, each piece of it will have a different acceleration history and thus elapsed time history.

Order of Presentation

The order of presentation will be Redshift, Antimatter, then Tetrons. This presentation will be delivered as a sequence of postulates, and will reference experimental evidence as required. When experimental evidence can be interpreted different ways, this will be discussed. One way may be referred to as the Standard Model. The other way, which I

modestly call the "Caywood Model", is a collection of postulates that work together. The whole of physics approach is employed to test the Caywood Model, to see if it holds up.

Previous Work

The text and diagrams are substantially the same as my paper posted on the physics archive https://vixra.org/abs/2209.0057. The term Sub-quarks are used in that online document. In this paper, the term "Tetrons" is used to emphasize they are a discovery and to avoid usage of a generic term "sub-quarks". Other authors have published using "subquarks" with different characteristics. The word "tetron" is descriptive because this entity is located at a vertex of a tetrahedral quark. Four tetrons are the four vertices of a quark, as explained in detail later.

This presentation omits some equations that are in the published paper and attempts to portray the same conclusions with diagrams.

METHODS AND MATERIALS

Methods

One procedure employed is to make lists of all possible non-repetitive permutations instead of just making a calculation of the quantity. For example, one can either write an equation like 43 or make a list of the resulting 64 results. Such a list is helpful in identifying new particles made from quarks.

A mental procedure is to consider an "all of physics" approach when doing simultaneous pattern matching of unsolved problems. For example, the two-slit experiment is helpful in understanding neutrino oscillation.

Tools

All of the illustrations are done with Autodesk AutoCAD LT 2021. The ability of AutoCAD to make blocks allowed easy creation of a library of particle symbols. Text and spreadsheet material was done with Microsoft Office Professional Plus 2016, which automates captions, references, the table of contents and index.

The computer used is a Microsoft Surface Book connected to two external 27" diagonal monitors. This allows the internal display to be turned off for longevity. The best feature of this model is no disk drive, meaning you can leave it running all the time. My printer is an HP Color LaserJet Pro M254dw, which has four toner cartridges.

Microsoft Access is a part of the Office suite and was used to create a database of tetrons, quarks, particles, particle and anti-particle pairs and atoms. Using Access, I created a report which is a pattern of a three-quark particle. The notation on the pattern changes depending on the particle being printed. Fortunately, this three tetrahedron particle model can be folded from a flat pattern of thirteen triangles. The most useful folded models have colored sub-quark vertices with colored pipe cleaners, hot melt glued to the interiors of the quarks and extending out the vertices. This allows connection of particles into nucleus, reaction and photon models.

These models in turn where photographed and the digital images traced in AutoCAD and refined. In Appendix B is an assortment of particle patterns for folding, instructions for assembly and photographs of finished models. Email me for a free copy of this 12 Mb database. If you update it with more data, please send your improved database back so I can distribute it to those who request it.

Definitions

Stationary Observer

Stationary observer is the same as freefall observer, meaning going in the same frame of reference as an object that has not accelerated in that frame of reference.

Elapsed Time and Time Rate

Elapsed time is different from rate of time. An object at a distance from an observer has a history of time passage which has recorded the rate of time passage and distance traveled at that rate.

The Minkowski diagram has a geometrized treatment of time and does not separately record the rate of time passage and the distance traveled at that rate. Rate of time for an observed object slows due to acceleration or gravity, therefore a Minkowski diagram is not a true record of elapsed time for the observed object.

Spin

Isospin, hereafter called spin, is the expression of time rate that is present in all particles. Spin is a tri-directional constant angular velocity. For hadrons, positive spin is matter and negative spin is antimatter.

The Feynman diagram is a particle version of the Minkowski diagram, where only a qualitative understanding of direction of travel is necessary. The Feynman diagram does not account for spin, which this proposal does.

Gluon

In standard model, "Gluons, the vector gauge bosons, carry the color charge of the strong nuclear force." In the same article, "Like the proton, most of mass (energy) of the neutron is in the form of the strong nuclear force energy (gluons)". The published paper, "Upper Limits on a Possible Gluon Mass" 2010 by Nussinov and Shrock states, "The literature on gluon mass limits is unsettled"

The Caywood model does not use color charge, or consider the gluon to be a vector gauge boson. It does hijack the word "gluon" because it aptly describes the gluing together of quarks, except in a different way. This is described in detail later. This definitions entry is a forenotice of the difference.

Naming Conventions

This paper uses 3 different tools (MS Access, MS Excel and AutoCAD), each of which has a unique set of formatting choices. The following have identical meaning:

A-1   any variable with a subscript -1 = antimatter

A^2 = A**2

p+ // p-   means a proton paired with an anti-proton

To accommodate the Access lack of subscripts:

Ve' = positron neutrino

<e- = electron, where the < is meaningless and serves to sort matter and antimatter separately

2B3 electron means electron with the #2 isotope and the #3 isomer.

Mathematical Foundation

This paper does not refer to tensors, which are useful in rotations and boosts in the same coordinate system in the same dimensions. Spacetime mixes space with a single understanding of time, which I believe are necessarily left separate, given the reciprocal relationship of time rate and elapsed time. 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 generating function technique

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

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

Multiplication

We do multiplication with numbers so readily and always come up with the correct answer. When we do a unit analysis of multiplication, thought is required. Take for example the formula for gravitation.

F = G * (m1 * m_2 /r^2)

Neglecting the constant to make the units correct, the gravitational force is m1 * m_2/r^2

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

The inverse square law: F = 1 / d^2, which we visualize as the spherical wavefront coming from a light source where intensity at the wavefront is the inverse square of distance. This makes sense because if a certain number of photons are emitted per unit of time, the density of photons landing on a spherical surface is per the inverse square law. The same number of photons is less dense (less intensity) the further from the source.

What are the "m/r" units? Kilogram per meter or kg*m^{-1}

The units of the gravitational constant G are m^{3}*kg^{-1}*s^{-2}

m^{3}*kg^{-1}*s^{-2} * kg * kg * m^{-2} = m*kg*s^{-2}

What does "m/r" mean? The best description is the gradient (slope) of a mass field. What is the cross product of two mass fields as in (m_1/r) X (m_2/r)? The best description is the attractive force between two objects due to their mass. Their response to this force depends on their inertia and all other forces acting on the tetrons.

Another instance is the electromotive force. The gradient (slope) of a charge field is q/r. The electromotive force between two charges bodies is (q_1/r) X (q_2/r). The attractive force is electrostatic force. The gradient of a magnetic field is B/r. The magnetism between two magnets is (B_1/r) X (B_2/r).

The net force vector on a tetron is the sum of mass, charge, magnetism fields:

F = (m_1/r) X (m_2/r) + (q_1/r) X (q_2/r) + (B_1/r) X (B_2/r)

In a later section, it is claimed tetrons are the four building blocks of quarks. Each tetron has a unit charge and unit spin, and each tetron both creates fields and responds to fields. If the net force vector produced by unit charges and spins in a field creating tetron acts on the unit charge and spin in a field responding tetron, the resulting interaction among any set of tetrons is an "n-body problem"[1], which was difficult to calculate in classical mechanics with just three bodies, given moving charges create magnetism and vice versa.