Predicting Spin, Other Characteristics of New Higgs-Like Boson by Using Temporal Energy Theory Concepts

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(Dated: November 30, 2012)

Large Hadron Collider (LHC) experiments this year have shown the existence of a new boson that resembles the Higgs boson. Although it is known that this particle has couplings to other particles that increase with their masses, the spin of the newly discovered boson is undetermined as of yet. The Higgs boson has been predicted to be a spin 0 particle. The LHC boson is not a spin 1 particle, suggesting that it is likely spin 0 or spin 2. Using concepts from Temporal Energy Theory, this paper proposes that the LHC's Higgs-like boson will likely be found to be a non-elementary spin 2 particle with positive parity, suggests what the particle is, and describes how this information relates to the predicted Higgs boson of the Standard Model and the generation of mass in objects.

1. Introduction

Investigators working on the Large Hadron Collider (LHC) experiments ATLAS [1] and CMS [2], with support from researchers conducting the TeVatron experiments CDF and D0[3], have discovered a new particle with a mass of approximately 125 GeV, consistent with the predicted Higgs boson of the Standard Model. This newly discovered particle, hereafter referred to as particle X, couples to other particles in a mass-dependent manner similar to the Higgs boson. Although it is understood that particle X cannot have a spin of 1, it has yet to be determined if it has a spin of 0 or 2. Spin 0 would mean that there is an extreme likelihood that particle X is indeed the Higgs boson of the Standard Model. Using concepts from Temporal Energy Theory* (TET) [4], this paper suggests that particle X will actually be found to be a non-elementary spin 2 particle with positive parity, suggests what the new particle is, and describes how this information relates to the predicted Higgs boson of the Standard Model and the generation of mass in objects.

2. Temporal Energy Theory

TET is a quantum description of gravity that provides a possible basis for uniting General Relativity and Quantum Mechanics. In the theory, the gravitational field consists of a field of two-dimensional, dot-like, faster-than-light particles,† referred to as "temporal particles," because they have a role in the passage of time from both a relativistic and quantum mechanical perspective. But not only are these particles components of the gravitational field, they also play important roles in the mass and spin of matter particles and force carriers.

In TET, matter particles and force carriers have structure, being composed of three elements: a frame, mass, and spin (Figure 1).‡ Particle frames are one-dimensional strings of energized space—they are energized in the sense that they stand out from the greater vacuum. These strings may exist as straight lines, waves, or loops. They are the skeleton of a particle, contain the particle's electric charge, and are responsible for a particle behaving as a particle or as a wave.

If frames are the skeleton of particles, mass is the muscle. In TET, temporal particles condense around the particle frames and in so doing bestow mass on the frames. This is related to the Higgs field of Quantum Mechanics, which also is based on tachyons. If the temporal particles surround a closed or semi-closed particle-frame loop, the particle represented by the frame will appear to have rest mass. If the particle frame is a straight line or open wave, it will not appear to have rest mass.

The spin field of matter particles and force carriers, in TET, refers to a volume of moving space within them. As with the particle frames, this area of moving space is associated with a condensed field of temporal particles.§ Temporal particles are spin 0, being point like (i.e., having no internal structure) and thus having no area of moving space within them. In Figure 1, each arrow labeled as "spin" represents ½ spin, even the arrow curved back onto itself on the right. Thus, photons and similar bosons are spin 1 as they are composed of two ½ spin sections, and leptons and quarks are spin ½.

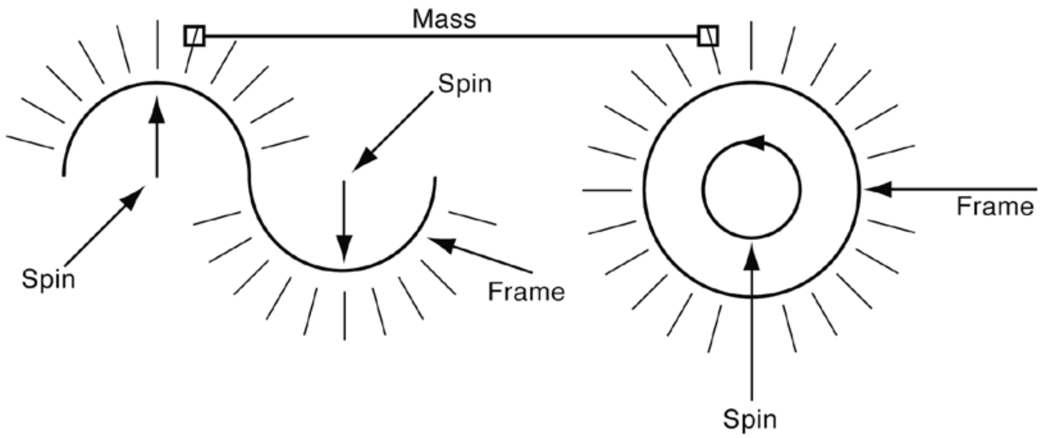

Figure 1. TET concept of the basic structure of a photon (left) and lepton or quark (right). In TET, matter particles and force carriers are composed of a frame (a one-dimensional string of energized space in the shape of a straight line, wave, or loop), a mass field (consisting of a condensed field of tachyons), and a spin field (composed of a volume of moving space that also is associated with a condensed field of tachyons. In

TET, the spin of leptons and quarks actually forms a cross pattern with the frame, meaning the clockwise or counterclockwise motion occurs in an area defined by the y and z axes. It is shown in an area defined by the x and y axes for convenience.) The photon is a spin 1 particle, consisting of two ½ sections—each section is represented by an arrow. The lepton (or quark) is a spin ½ particle—like a single arrow wrapped back onto itself.

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3. Spin of LHC's Particle X

In TET, the only fundamental particles that exist beyond those of the Standard Model are temporal particles, sterile neutrinos, and very short-lived exotic particles, such as lepton-like particles (non-quarks) with fractional charge. The Higgs boson, as it is currently characterized—an elementary, spin 0 particle that bestows mass on other particles—does not exist. The question then is, What is the nature of the LHC's particle X?

One of the principal ways that particle X decays is into two photons. From the TET perspective, and extrapolating backward, particle X likely is a compound particle consisting of two photons overlapping in a figure-eight pattern (Figure 2). This pattern is probable because it produces two closed, or nearly closed, particle-frame loops—as stated above, such loops are associated with rest mass. Particle X is known to have a rest mass of approximately 125 GeV. As each photon is spin 1, particle X would be spin 2.

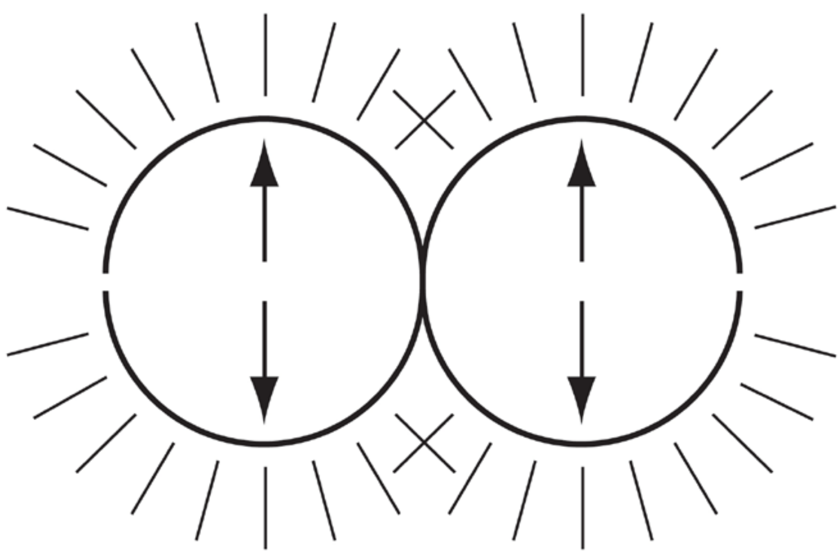

Figure 2. TET concept of Higgs-like boson (particle X) discovered at the LHC. With each arrow representing ½ spin, particle X is spin 2. It consists of two overlapping photons that form a figure-eight pattern.

Another decay mode involves particle X decaying into two Z bosons. This also is consistent with TET, as in that theory, a Z boson is a type of a photon. Thus, a Z boson looks similar to the left drawing of Figure 1. However, a Z boson produced in the laboratory, again from the perspective of TET, is typically vibrating so fast that it forms a standing wave, like a vibrating string bound on both ends, also in a figure-eight formation, giving the effect or illusion of it having a closed frame and thus rest mass.

As photons and Z bosons are closely related, particle X can be viewed not only as a photon-photon composite particle, but as a Z boson-Z boson composite, or even a photon-Z boson composite. Note that in the particle X state composed of two Z bosons, neither Z boson can oscillate normally to produce a standing wave because one Z boson's ability to oscillate is blocked by the other Z boson. The spins of the particles start off by moving away from one another—see the four arrows in Figure 2, the two on the left are moving away from each other, as are the two on the right. In attempting to oscillate, the arrows would change directions such that the two on the left would be pointing toward each other, as would the two on the right. When pointing toward each other, each arrow blocks its partner arrow. The effect of this is twofold: First, the two Z bosons appear lighter (less massive) than normal; the blocking action takes some of the "steam" out of each particle. Second, some of the energy between them is stored, such as when a spring is compressed and held down. Eventually, this energy is released and helps the Z bosons spring apart and further decay into other particles.[¶]

Laboratory-generated W bosons, from the standpoint of TET, are single-loop standing waves produced when the two loops of a Z boson's standing wave separate but remain vibrating. Regarding particle X, the equivalent would be the separation of the left and right halves of Figure 2, producing two circular objects, or W bosons.[‖] The same mechanism described above causing the Z bosons to be lighter than typical Z bosons would cause these W bosons to be lighter than typical W bosons. The spring action also would still occur, helping the W bosons break up and decay into other particles.

4. Parity of LHC's Particle X

If a particle and its mirror image look the same, the particle has positive parity. Considering that particle X, as it is conceptualized in TET, would look exactly like its mirror image, particle X should have positive parity.

5. Conclusion

From the perspective of TET, the Higgs-like boson recently discovered at the LHC is likely a non-elementary spin 2 particle with positive parity. TET suggests that it consists of two briefly joined or entangled high-energy photons or Z bosons that form a distinct composite particle. Note that even if it is actually a spin 2 particle, it would not be a graviton, particularly as it is not an elementary particle. (Gravitons are unlikely to exist.)

As described above, the decay of particle X into two photons, two Z bosons, or two W bosons is in line with TET concepts. For reasons that are beyond the scope of this paper, TET also can be used to show that the two-tauon decay mode of particle X would come close to but not exactly match expectations from the Standard Model for the true Higgs boson, as there would be a release of energy in this decay mode that could not be accounted for via the Standard Model. The two tauons would not have all the energy they should based on that theory. This energy would be discernible through TET concepts. The true Higgs boson is expected to be able to decay into two bottom quarks also based on the Standard Model. However, as with the tauons, it is unlikely that two bottom quarks would be created within Standard Model expectations, from the standpoint of TET.

The Higgs boson as it is currently conceptualized likely does not exist. TET suggests that the particle that actually bestows mass is a point-like, two-dimensional faster-than-light particle. In TET, this particle also plays an important role in electric charge, spin, magnetism, gravity, dark matter, and dark energy. From the perspective of TET, true Higgs bosons may be regarded as small accumulations of tachyons within the greater tachyon field, but not real particles unto themselves.

TET is ultimately a candidate for the "theory of everything." It provides a conceptual framework for uniting General Relativity and Quantum Mechanics, showing how these two theories describe the same basic phenomena but from different perspectives.

References

[1] Aad G. et al. (ATLAS Collaboration). Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC. Physics Letters B, 716, 2012, 1–29.

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[3] Aaltonen T. et al. (CDF and D0 Collaborations). Evidence for a Particle Produced in Association With Weak Bosons and Decaying to a Bottom-Antibottom Quark Pair in Higgs Boson Searches at the Tevatron. Phys. Rev. Lett., 109, 071804, 2012.

[4] Williams L. The Greatest Source of Energy—A New Theory of Time. McNair and Williams, Baltimore, 2010. www.greatestsourceofenergy.com.

Notes

* Disclaimer: Although TET is described as a "theory" for practical purposes, its mathematical formulation has not yet been fully established. As such, it is likely more accurately described as an "idea for a theory" rather than a theory itself.

† Temporal particles move faster than light from creation, consistent with Special Relativity. It would take an infinite amount of energy to stop them. In TET, these particles fill all of three-dimensional space, are continuously connected to one another (with limited exceptions) and are a constituent part of all matter and force fields. As such, every matter and force-carrying particle technically extends throughout the universe, meaning that for any two given particles of matter, for example, there is actually zero distance between them. Accordingly, any signal propagated by an event via the field of the faster-than-light particles takes zero time to be detected by another event, as there is technically zero distance between the events. For two events in which there is a cause-and-effect relationship, causal information is identifiable by all observers in all reference frames, because all observers would immediately be able to discern the effect of one event on the other, although the observers may do this at different times relative to each other.

Note that, from the perspective of TET, the extension of all matter particles and force carriers throughout the universe is related to the quantum mechanical idea that the probability waves of these particles—the probability of finding each of them in a particular place—extends throughout all of three-dimensional space.

‡ As noted in the previous footnote, all temporal particles are a constituent part of all matter and force fields and are connected to one another. Thus, in a scenario in which a force carrier is about to act upon a matter particle, for example, all of the temporal particles of the force carrier and matter particle, as well as those in the intervening space are linked. These bonds allow the force carrier to be as connected to the front of the matter particle as the back, such that when the force carrier acts upon the matter particle, it sets the entire matter particle in motion as a whole. No information needs to be transmitted to the rear of the matter particle over some time.

§ In TET, the field of tachyons surrounding the moving volume of space within force carriers and matter particles is the physical reason the spin of these particles is calculated to be faster than the speed of light. As indicated in a previous footnote (†), no faster-than-light communication occurs through the field of tachyons.

¶ Instead of considering each Z boson to be less massive than normal, one could consider one Z boson to be real and the other to be virtual. This, however, is not needed in TET.

The potential energy that is stored between them, once released, helps tear the Z bosons apart and provides enough force to induce them to further decay.

|| Technically, from the standpoint of TET, these two W bosons are not typical W bosons, in that a typical W boson is akin to a single-loop standing wave produced by one vibrating string, whereas each of these two W bosons is akin to two vibrating strings working together to produce a single-loop standing wave. Note this suggests that a true W boson, again from the perspective of TET, is not a spin 1 particle, but rather a spin ½ particle, as it would be associated with one straight arrow, let us say the left arrow of the left drawing of Figure 1 (now considered to be a Z boson instead of a photon). However, half of a spin 1 particle does not equate to a spin ½ particle, no more than half of a dollar bill equates to fifty cents. More has to happen before it can be said to be a spin ½ particle, like more has to happen to the dollar (i.e., it has to be broken into change) before one can call half of it fifty cents. Half of a dollar bill is half of a dollar bill. If one sought a definite answer as to the spin of half of a spin 1 particle, an adequate answer would be spin 1.