

Is There Higgs' Boson?

A. A. Nassikas

Technological Institute of Larissa

10, Ethnikis Antistasseos str., 41335 Larissa, GREECE

e-mail: a.a.nass@teilar.gr

In the near future on the basis of the CERN experiment it will be known whether the standard model is valid or not. This model requires the existence of Higgs' boson; if not detected a new model should be found. In this paper the model proposed is based on the Minimum Contradictions Physics while experimental and theoretical data as the ones related to Santilli's Etherino and a new proposal as well, can show that Higgs' boson is not necessary for the nature's function explanation. Basic element of this point of view is the interaction of the gravitational (g) with the electromagnetic (em) space-time.

1. Introduction

According to the Minimum Contradictions Physics, the following are valid: [1]

1. *The Claim for Minimum Contradictions: "What includes the minimum possible contradictions is accepted as valid".*
2. *We have minimum contradictions in Physics when it is based only on the basic communication system, i.e. on logic \wedge (classical logic plus sufficient reason principle) and on the "anterior-posterior axiom".*
3. *Statement III: Any matter system can be described in stochastic space-time terms.*

1.1. Hypothetical Measuring Field (HMF)

The basic tool is the Hypothetical Measuring Field (HMF), which is defined as a hypothetical field, which consists of a Euclidean reference space-time, in which at each point A_0 the real characteristics of the corresponding, through the transformations of deformity, point A of the real field exist. In the HMF, we define as relative space time magnitude sr the ratio of the real infinitesimal space time magnitude ds to the corresponding, through the deformity transformations, infinitesimal magnitude ds_0 of the reference space-time; i.e., $sr = ds / ds_0$.

1.2. Stochastic Space-Time

Stochastic space-time derives from the distribution of the properties of a flat relativistic space-time based on the probability density $P(\mathbf{r}, t)$ of Schrödinger's relativistic equation, which is proved as valid. The negative values of $P(\mathbf{r}, t)$ can correspond to the geometry of the anti-matter. The incomprehensible notion of negative probability is compatible with the claim for minimum contradictions (since contradictions are always expected).

1.3. Electromagnetic Space-Time

The electromagnetic (em) space-time is a space-time all of whose magnitudes are considered imaginary and behave exactly like the gravitational (g). Electromagnetic (em) space-time is described by means of space-time wave functions such that:

$$\Psi_{em}(\mathbf{r}_{em}, t_{em}) = \Psi_{em}^g(\mathbf{r}, t) \quad (1)$$

where Eq. (1) has meaning due to the coexistence of (g) and (em) space-time under a scale. On this basis space-time as a whole consists of:

Real (g) space-time distributed according to a $P_g(\mathbf{r}, t)$ function revealing so (g) matter or antimatter for positive or negative values of $P_g(\mathbf{r}, t)$.

Imaginary (em) space-time distributed according to a $P_{em}(\mathbf{r}, t)$ function, revealing (em) matter or antimatter for imaginary positive (+i) or imaginary negative (-i) values of $P_{em}(\mathbf{r}, t)$.

The stochastic space-time has the property of self-similarity, while, at the same time, it is chaotic (contradictory)- non-deterministic. It is something compatible with fractal geometry, which is frequently the geometry of Nature. [2]

2. Basic Properties of Stochastic Space-Time

2.1. Statistical Interpretation

According to the Claim for Minimum Contradictions, in order that further contradictions be avoided, a matter system in general is described through the same principles as a particle field is. This can be valid when a matter-space-time field locally behaves as a space-time-particle field. This implies a statistical interpretation and a distribution of matter space-time according to probability density:

$$P(\mathbf{r}, t) = (i\hbar / 2m_0c^2) \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right) \quad (2)$$

Eq. (2) is valid only on condition that the space-time particle field described extends to infinity. [1] In this case, Ψ function locally is described by an equivalent local space-time particle field wave function Ψ_i , where this field is regarded as extended to the infinity. This can occur when Ψ is differentiable everywhere, but its derivatives are not continuous. A basic property of stochastic space-time is described by the equation: [1]

$$\overline{sr}(\mathbf{r}, t) = \left\langle \overline{sr} \right\rangle_i V_0 P_i(\mathbf{r}, t) = \left\langle \overline{sr} \right\rangle V_{OT} P(\mathbf{r}, t) \quad (3)$$

where $\overline{sr}(\mathbf{r}, t)$ is the mean value of any space-time relative magnitude and where V_0 , $\left\langle \overline{sr} \right\rangle_i$, $P_i(\mathbf{r}, t)$ refer to local particle fields

while V_{OT} , $\left\langle \overline{sr} \right\rangle$. $P(\mathbf{r}, t)$ refer to the whole matter system. In reality the equivalent local particle field is not extended everywhere unless the whole constitutes a particle field. The part of this particle field that exists in reality is an infinitesimal region

around the point (\mathbf{r}, t) ; this region behaves as if this local particle field were extended to the infinity. On this basis the coexistence of (em) and (g) space-time in an infinitesimal area of a point (\mathbf{r}, t) can be studied by the aid of local coexisting (em) and (g) space-time particle fields regarded as extended to the infinity. Thus, the communication between (em) and (g) infinitesimal space-time around a point (\mathbf{r}, t) is studied by the aid of a closed system consisting of (em) and (g) particle fields regarded as extended to the infinity.

2.2. Expectation Values

For the energy and momentum expectation values $\langle E \rangle, \langle \mathbf{P} \rangle$ of a space-time particle field the following are valid: [1]

$$\langle E \rangle^2 = c^2 \langle \mathbf{P} \rangle^2 + m_0^2 c^4 \quad (4)$$

$$\frac{d}{dt} \langle E_g \rangle = 0 \quad , \quad \frac{d}{dt} \langle E_{em-g} \rangle = 0 \quad (5)$$

where $E_{em} = iE_{em-g}$; E_{em-g} can express energy which can be converted from (em) into (g) form. We may notice that if $m_0 = 0$, Eq. (4) is valid both for real and imaginary energy and momentum. Thus, we may assume that only photons ($m_0 = 0$) can convert (g) space-time into (em) one and inversely.

2.3. Closed Matter Systems

In a closed system consisting of a real (g) space-time particle field and a coexisting imaginary (em) one, by definition, there are not photons that flow out the system while energy conversion, according to Eqs. (5), takes place only through photons. [1]

Thus in the case of energy conversion we have:

$$\delta \langle E_g \rangle + \delta \langle E_{em-g} \rangle = 0 \quad (6)$$

$$\langle E_g \rangle + \langle E_{em-g} \rangle = \text{const.} \quad (7)$$

Eqs. (6,7) express the energy conservation principle of the closed system mentioned consisting of a gravitational and a coexisting electromagnetic space-time particle field. Therefore Eqs. (6,7) can apply to the coexisting local space-time particle fields of Sec. 2.1, i.e. they can apply to any closed matter system.

3. Space-Time -Aether Energy Absorption or Elimination

3.1. Energy Conservation

Because of Eqs (5,6,7) we may notice that we can have energy change only through photons. According to Sec. 2.3, we conclude that for a closed system is valid that: [1]

$$\bar{E}_g + \bar{E}_{em-g} = \text{const} \quad (8)$$

This expresses the energy conservation principle for a closed matter system consisting of coexisting (g) and (em) space-time.

3.2. Universal Closed System

If we consider the Universe as a closed system that has been derived from zero, because of Eq. (8) we will have: [1]

$$\bar{E}_g^U + \bar{E}_{em-g}^U = 0 \quad (9)$$

where the superscript U indicates Universe quantities. A basic property of the stochastic space-time is described in the following relation [1]:

$$\bar{V}_g^U \uparrow \Rightarrow \bar{E}_g^U \downarrow \quad (10)$$

Thus, when \bar{E}_g^U is very high, the volume \bar{V}_g^U that contains \bar{E}_g^U will be very small. Expansion of the Universe means increase of \bar{V}_g^U and decrease of \bar{E}_g^U , as well as increase of \bar{E}_{em-g}^U according to the Eq. (9). From Eq. (9) it is derived that for positive value of \bar{E}_g^U the \bar{E}_{em-g}^U value will be negative. Thus, the evolution of the Universe is a process reverse to that of the creation of the Universe, and during evolution the quantity \bar{E}_g^U decreases tending to zero, while the quantity \bar{E}_{em-g}^U increases tending also to zero.

3.3. Gravitational Absorption

We can assume that the charge energy \bar{E}_{em-g}^U is the energy sum of all the positive-negative charges regardless of whether they are joined or not. When there is an approach and coincidence tendency between positive and negative charges, which might be proton-electron couples, there is a tendency for nullification and increase of \bar{E}_{em-g}^U . Thus, the approach between electrons and protons has as a result the increase, according to Sec. 5.2, of \bar{E}_{em-g}^U and due to Eq. (9), the decrease of \bar{E}_g^U . Consequently, we may assume that the following empirical statement is valid. [1,3]

Empirical Statement I: "During the approach of an electron with a proton there is absorption of gravitational energy".

By the term 'Empirical Statement' we mean a statement compatible with the theory proposed and having the possibility to be verified in an experimental way.

4. Verification

4.1. Santilli's Etherino

On the basis of *Empirical Statement I* we can reach to results compatible with the following reaction proposed and theoretically explained according to Hadronic Mechanics by R.M. Santilli: [4]



Reaction (11) corresponds to charge disappearance, to neutron production, and to aether absorption (0,78 MeV) with the aid of the process particle α (0,78 MeV) named etherino; this is compatible with what was mentioned in Sec. 3.3 on condition that the aether is regarded as the matter-space-time itself.

Note that Empirical Statement I derives from Eqs. (6,7) which implies an interaction between the (g) and the (em) space-time aether.

4.2. Electric-Magnetic Attraction or Repulsion

During an electric or magnetic attraction or repulsion we have acceleration of an electric charge carrier or a magnet. This implies a mass acceleration which corresponds to a gravitational

energy increasing. According to the present point of view there is not potential acting at a distance; therefore this is attributed to the conversion of the electric or magnetic energy into gravitational one which is compatible with items mentioned in Sec. 3.

4.3. Various Other Applications

On the basis of Empirical Statement I of Sec. 3 an alternative explanation has been given for light water electrolysis according to Mills [3] and Kanarev [3] as well as for Kozyrev radiation [3] and atoms radiation according to Whitney. [1,5]

It is noted that the energy conservation principle as it has been expressed by the Eqs. (6, 7) is compatible with the 1st Thermodynamic Axiom (conversion of mechanical energy - which can be regarded as (g) energy - into heat emission which constitutes an electromagnetic radiation).

4.4. A New Proposal [6]

An experiment is proposed relative to the (g)-(em) interaction. A magnetic field is developed in the convergent part of the nozzle of fig.1 that is made from a material 1, consisting of superconducting Sm-Ca-Cu-O, by means of the superconducting magnet 3. Superconducting Material 1 traps the magnetic field, which in turn acts as a pressure on it. [7,8] The material mentioned has been tested for its ability to trap the magnetic field and it was successful for density magnetic flow up to 8T. [7,8] If a force F is developed, the system can be accelerated. The over mass acquired can be explained on the basis of the (g) + (em) interaction according to the spirit of this paper; the (g) energy and momentum change required is due to (em)-magnetic energy and momentum change through photons as mentioned in Sec. 2.2 and vice-versa. Note that these photons are mentioned as fluxons. [9]

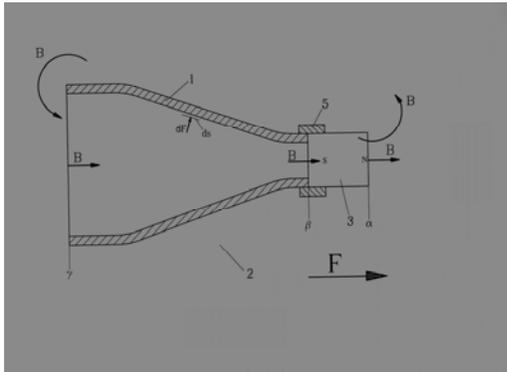


Fig.1. Propulsion by Means of Superconducting Magnetic Field Trapping

5. Conclusion (Higg's Boson)

As is known, neutron decay takes place through the mediation of W and Z bosons. According to what has been accepted

until now, the W and Z bosons in turn acquire mass through the aid of the Higgs' boson, which, however, is hypothetical. [10]

Santilli's reaction could be regarded as the process inverse to neutron decay. Therefore, the etherino should imply an inverse action of W and Z. If this is the case, the Higgs boson should play a basic role as well. According to the present paper, the etherino is explained through the interaction between the (g) and the (em) space-time aether.

Also according to what was mentioned in Sec. 4.2 the interaction of the gravitational (g) with the electromagnetic (em) is adequate to explain the mass increasing without the need of Higg's boson. However the interaction mentioned in Sec. 4.2 might be interpreted through the notion of potential; a more complete explanation might be given through the new proposed device of Sec. 4.4 figure 1, if it works.

All these might have some importance if CERN experiment fails to detect the Higgs' boson. [10]

References

- [1] A.A. Nassikas, **Minimum Contradictions Everything**, Rev. and Ed. M.C. Duffy and C.K. Whitney, ISBN: 1-57485-061-X, Hadronic Press (2008).
- [2] B. Mandelbrot, **The Fractal Geometry of Nature** (Freeman, N.Y., 1977).
- [3] A.A. Nassikas, "The Cold Fusion as a Space-Time Energy Pumping Process", Proceedings of the 8th International Conference on Cold Fusion, Ed. F. Scaramuzzi, Societa Italiana di Fisica (2000).
- [4] R. M. Santilli, "Neutrino and/or etherino?" Foundations of Physics 37, 670 (2007) [1A]; for extensive studies see also R. M. Santilli, Hadronic Mathematics, Mechanics and Chemistry, Volumes I, II, III, IV and V, International Academic Press (2008) also available as free downloads from the web site <http://www.i-b-r.org/Hadronic-Mechanics.htm>.
- [5] C.K. Whitney, "Do Atoms Really Have 'States'?", Proceedings of PIRT VIII, London, Ed. M.C. Duffy (2002).
- [6] A.A. Nassikas, "Minimum Contradictions Physics and Propulsion via Superconducting Magnetic Field Trapping," SPESIF-2010, AIP Conference Proceedings. Volume 1208, pp. 339-349 (2010).
- [7] Ikuta, H. et al, "Melt-processed Sm - Ba - Cu - O superconductors trapping strong magnetic field", Supercond. Sci. Technol. 11, pp 1345-1347 (1998).
- [8] Nariki, S. et al, "Field trapping and magnetic levitation performances of large single-grain Gd-Ba-Cu-O at different temperatures" in the proceedings of the 17th International Symposium on Superconductivity, Elsevier, B.V., pp 654-659 (2004).
- [9] <http://en.wikipedia.org/wiki/Superconductivity>
- [10] www.exploratorium.edu/origins/cern/ideas/higgs