Contents

Supersymmetry, extra dimensions, RG running of the Higgs quartic coupling of MSSM/ NMSSM models and the seven faces of the God particle

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Abstract

In this paper, we focus on the calculation of the supersymmetric term for obtaining the mass of the lightest Higgs boson. Thus will provide the scale of supersymmetry. Similarly, entering the exact angle β ,will allow us to calculate the masses of the remaining four Higgs bosons , m_A, m_{H_0}, $m_{H^\pm}$ and the stop mass $\simeq$ 422.9 Gev

Was used for this, the well-known model of a one-dimensional string, or a dimensional box. We believe that the results obtained consistent with the observation, carry a string model mathematically satisfactory of a n-dimensional string, well known to all physicists. The main novelty of this model is the introduction of dimensionless ratios between the Planck length and the length n dimensional, as the length of the string. An extension of the Heisenberg principle to extra dimensions, will derive a principle of equivalence between mass, time and space so that it showed that the mass is actually another dimension. This principle of equivalence, so described, anger further and allow the equivalence between spin, probability, fluctuations and dimensions. Successive breaking symmetries-topology geometry involved, appears to be the cause of the distinguishability between spins, number of particles, dimensions, etc.; to the observer to make measurements of observables.

1 Introduction

In this paper, using the extension of the Heisenberg uncertainty principle to extra dimensions, allows the calculation of the logarithmic term of the standard model MSSM, for the mass of the lightest Higgs boson.

Likewise, this principle implies that the mass itself is a dimension more, and reverse geometric or metric terms, the spatial length. This directly implies T-duality of the theory of superstrings.

The extent of the uncertainty principle with the extra dimensions is not a fad, or an arbitrary idea, but it is dictated by the interaction of the observer to lengths of alleged extra dimensions.

Put more clearly: If the term of uncertain length. and if this length one-dimensional at scales very large, is actually an n-dimensional length at very small scales, then to preserve the Heisenberg uncertainty principle, (a length scales for length n-dimensional observer appears as one-dimensional) and its minimum value of uncertainty, 1/2, a modification is necessary both qualitative and quantitative to preserve him.

These changes lead directly to the principle of equivalence of mass-energy-space-time on an equal basis.

Some mathematical expressions which have been deduced from present semi empirical way, but based on the model of a vibrating string that uses the well established result for quantum mechanics: a string or particle in a box n dimensional. The main equations are obtained by applying the principle of equivalence mass-space-time, which is deducted from the extension of the principle of Heisenber to extra dimensions. Using this principle and the above mentioned model of n-dimensional string in a box. The empirical results are of such accuracy and self-consistency that can not be ignored, and treated as mere numerology. We have the conviction that these expressions are the derivation of a string theory, whose mathematical basis is unknown, except that one of its foundations, resulting in the well-known model of a string in a box n dimensional.

2 The Heisenberg uncertainty principle and extra dimensions

2.1 The scaling law

In one of our previous work (God and His Creation: The Universe), we deduce the scaling law, which allowed us the calculation of the baryon density, fully compatible with the experimental results.

We will quote this result: *(3.1.2 "Correction of the total particle count of applying the change of scale and the Heisenberg uncertainty principle", pg 13-14)*

The Heisenberg uncertainty principle states that:

$$\triangle x \triangle p \geq \frac{\hbar}{2} \quad (8)$$

If we consider a scale change $x_1, \ x_2, \ p_1, \ p_2 \quad x_1 > x_2$; by simple algebraic manipulation yields the following equation, considering the minimum limit of uncertainty given by the factor 2:

$$2\left(\frac{\triangle x_1}{\triangle x_2}\right) = 2\left(\frac{\triangle p_2}{\triangle p_1}\right) = 2\left(\frac{\triangle m_2}{\triangle m_1}\right) \quad (9)$$

Being m_2 , m_1 , the respective masses of the particles, whether real or virtual.

If there is an infinite number of particles would exist an infinite number of jumps of scale given by (9). This would imply the existence of infinite energy and therefore the appearance of infinite quantities in the calculations, as is currently the unsatisfactory, although very efficient use of ad hoc method of renormalization.

For this reason we think that space-time has to be quantified with a minimum scale length. The minimum scale length should be the Planck scale.

If this minimum length is defined as:

$$\sqrt{\frac{\hbar G_N}{c^3}} = l_p = l_0 \quad (10)$$

Thus, if we consider a length l_1 ,and its uncertainty $\triangle l_1$ interpreted as a differential and considering particle-antiparticle pairs, or two real pairs of particles produced by two photons of sufficient energy, it must be for the amount of particles with respect to the minimum length scale of Planck:

$\triangle l_1 = dl$, $l_0 = l_p$, $n(p) =$ number of pairs $\quad \frac{2dl}{l_0} = \frac{2dl}{l} = 2 \cdot dn(p)$

$2 \cdot \int_{l_0}^{l_1} \frac{dl}{l} = 2 \cdot \int dn(p) \qquad 2 \cdot n(p) = 2\left|\ln\left(\frac{l_1}{l_0}\right)\right| = 2\ln\left(\frac{m_p}{m_1}\right) \quad (11)$

Being m_p the Planck mass. Using (11) we have that the maximum number of pairs
for the electron in the lowest energy state of vacuum is: $2\ln\left(\frac{m_p}{m_e}\right) = 2np(e^-)$

Thus the maximum number of particles to the vacuum state of minimum energy, and using the previous result by (6) and (5), with the most accurate known value of universal constants:

$Sn_t = 2\ln\left(\frac{m_p}{m_e}\right) + (n_r(\gamma) = \alpha^{-1}) = 240.09168122877 \quad (12)$

$2\ln\left(\frac{m_p}{m_e}\right) = 103.05568214477$

$\alpha^{-1} = 137.035999084$

With the above result is obtained the value of the density of baryons:

$\Omega_b = (240.09168122877 - 240)/2 = 0.045840614385$

2.2 Calculation of the value of vacuum Higss (Fermi constant) and the boson mass Higss m_h

In our two previous works(God and His Creation: the Universe , The God Particle: the Higgs Boson, Extra Dimensions and the Particle in a Box), we calculated the mass of the lightest Higgs boson using two different methods:

1. The model of a particle in a spherically symmetric potential: (pg 70-71 God and His Creation: the Universe). We quote :

The radial potential derived from the solution of the Schrodinger equation:

$-\frac{\hbar^2}{2m_0 r}\cdot\frac{d^2u(r)}{dr^2}+V_{eff}(r)u(r)=Eu(r)$

Which is precisely a Schrodinger equation for the function u(r) with an effective potential given by:

$V_{eff}(r)=V(r)+\frac{\hbar^2 s(s+1)}{2m_0 r^2}$

V(r) = 0, or solving the vacuum in the basis of spherical harmonics.

$V_{eff}(r)=\frac{\hbar^2 s(s+1)}{2m_0 r^2}$

The Higgs vacuum, and specifically the value of the Higgs boson mass of less massive (minimum energy state) to be consistent with a spin value neutral, or zero, necessary for the matter-antimatter symmetry, must be, necessarily a function of the sum of the value of energy due to the sum of these energy value for the value of angular momentum of the spins. The projection, by convention the z axis, of all possible states of the spins for all possible spins, 0, 1/2, 1, 3/2 and 2 should be zero counting antimatter. There are thirty states. A self-interaction of this vacuum that eventually decays to a state of minimum mass, nonzero, electric charged and stable, that is: the electron. This decay must comply with the change of scale, according to equation (11)

The thirty states of matter-antimatter self-interaction of the Higgs vacuum: $30=2\sum_s 2s+1=1^2+2^2+3^2+4^2\approxeq l_p^2(7D)+R_H^2(7D)+l_\gamma^2+1^2$

Energy value by the angular momentum: $V(r)=\frac{\hbar^2 s(s+1)}{2m_0 r^2}=E_s=\frac{\hbar^2 s(s+1)}{2m_0 r^2}$

Isolating the spins, and having a radius of self-interaction $l_p^2/l_p^2=l_p^2(7D)/l_p^2(7D)=R_H^2(7D)/R_H^2(7D)=l_\gamma^2/l_\gamma^2=1$; equation can be written as:

$s(s+1)=\frac{E_s 2m_0 r^2}{\hbar^2}\quad : E_s 2m_0 r^2=(E\cdot t)^2\quad ; s(s+1)=\frac{E^2t^2}{\hbar^2}$

The Heisenberg uncertainty principle states that: $\triangle x\triangle p\geq\frac{\hbar}{2}$; whereby the above equation can be written as:

$s(s+1)=\frac{(\triangle x\triangle p)^2}{\hbar^2}$

Performing the sum for all spins, we have: $\sum_s s(s+1)=\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}$

The states corresponding to antimatter, or the second solution of Dirac:

$\sum_s s(s+1)_{(-)}=\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}(-)$; And the total sum: $2\sum_s s(s+1)=\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}+\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}(-)$

Since the Higgs vacuum decays to its minimum energy state with nonzero mass (and stable) and electric charge: the electron. It must meet the equation (11) by changing the scale, so you can see the following equation:

$\frac{dx^2}{x^2}=\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}+\sum_{x_1,p_1}^{x_5,p_5}\frac{(\triangle x\triangle p)^2}{\hbar^2}(-)=2\sum_s s(s+1)$

$\frac{dx^2}{x^2}=2\sum_s s(s+1)=\frac{dm^2}{m^2}\quad ; \int_{X_1}^{X_0}\frac{dx^2}{x^2}+C=\ln(m_{X_0}^2/m_{X_1}^2)+C=\ln(m_H^2/m_e^2)+C=2\sum_s s(s+1)$

$\ln(m_H/m_e)=\sum_s s(s+1)\ -C$; Using Tables VI and VII, the number of symmetry between fermions and bosons of the standard model, 12 = 4!/ 2, the constant C : $C=1/\ln(m_Z/m_e)$

So they finally holds: $\ln(m_H/m_e)=\sum_s s(s+1)\ -1/\ln(m_Z/m_e)=12.41730112$

$m_H=m_e\exp[\sum_s s(s+1)\ -1/\ln(m_Z/m_e)]\rightarrow m_H(Gev)=126.2366059\ Gev$

2 The calculation by the use of the extra dimensions and string-dimensional model in a box. quote (The God Particle: the Higgs Boson, Extra Dimensions and the Particle in a Box , “5 Calculating mass of less massive Higgs boson”) :

Since, at higher wavelength corresponds to a mass smaller, then, applying equation (1), a model of particle in a box, using the major length of seven-dimensional torus as a measure of the box with a value for x, the minimum possible, to the vacuum zero point (x = 2), we have:

(1) $P(x) = |\psi(x)|^2$; (1) $P_n(x) = \begin{cases} (2/L)\sin^2(n\pi x/L) \ ; \ 0 < x < L \\ 0 \ ; \ otherwise \end{cases}$

$P(2, l_P(7D)) = (2/l_P(7D))\sin^2(2\pi/l_P(7D)) = \lambda_{VH}/\lambda_H$

- (9) $\lambda_{VH}/\lambda_H = (2/3.0579009561024)\sin^2(2\pi/3.0579009561024) = 0.51245749179704$
- $m_H(Gev) = (246.22\ Gev)0.51245749179704 = 126.177\ Gev$

The small difference between the value âĂŇâĂŇobtained by these two methods is likely to be due to the effect of CP violation phase angles $\delta_{13} = 1.2 \pm 0.08°$, by the interaction of change in flavor between the top and bottom quarks, the CKM matrix.

In this way, appears to be satisfied that : $126.177\ Gev/\cos^2(\delta_{13}) \approxeq 126.2366059\ Gev$

2.2.1 Breaks symmetry

With this method you start implementing the principle of equivalence mass-space-time, which later develop as a whole.

The sum of the spins is equivalent to half the dimensions, less time,

of a 10 dimensional space time. Stated equivalently, the sum of the spins matter-antimatter is equivalent to 10 dimensions.

$2\sum_s s \Leftrightarrow 10d$

The matrix of five Higgs bosons is equivalent to the amount of particles of the standard model, the scale where there are no supersymmetric particles. Count the value of the vacuum itself as a state-Higgs particle.

$3l + 3\nu + 6q + w^+ + w^- + z + \gamma + 8g + Higss\ Vacuum \Leftrightarrow 5H \times 5H$

The continuous operation of transformation of a particle with spin 1/2, to the spin 2, the graviton, is of dimension 10, counting in steps of spin transformation 1/2

$\left\{(0 + \frac{1}{2}) = \frac{1}{2} \ ; \ (\frac{1}{2} + \frac{1}{2}) = 1 \ ; \ (\frac{1}{2} + \frac{1}{2} + \frac{1}{2}) = \frac{3}{2} \ ; \ (\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}) = 2\right\} \Leftrightarrow 10d$

Theorem 1. The duplication of the group SU (5), involves directly the group SU (7)

$2dim[SU(5)] = dim[SU(7)]$ (1)

The above equality has the following physical effects:

1. The two copies, SU (5), of 24 +24 particles directly involves the supersymmetry of the 24 standard model particles, 24 particles and 24 s-particles. Are not themselves counted Higss bosons, 5 which are the generators by two copies of $5 \times 2 = 10$

2. The application of the principle of equivalence mass-space-time generates a symmetric equivalence between the number of jumps total spin 1/2, from a particle of spin 0 (boson Higss) to reach the largest particle of spin possible, or graviton, and the number of dimensions factorable, 10, discounting the time.

3. The equality of the expression (1) and points 1. and 2. necessarily imply that the supupersimetria should manifest as a double copy of the group SU (5), being the single copy of the group SU (5) the manifestation of vibrating strings in five dimensions, or 5 dimensional brane.

4. The spins are equivalent to jump from a minimum uncertainty factor of 1/2, and also establishing an equivalence ratio given by: $(l_p/l_p)/2$; where 2 is the minimum value derived by the length value of zero point energy and obtaining the minimum value of uncertainty, using the one-dimensional model of a string with a length of the box of 4, equivalent to the sum of coordinates spherical four-dimensional Cartesian, due to the four non-zero spin and vice versa (principle of equivalence mass-space-time), ie:

a) $4 = \sqrt{2^2 + 2^2 + 2^2 + 2^2}$

b) $\psi^2(L = 4, x = 2) = (2/4) \cdot \sin^2(2\pi/4) = 1/2 = \sin^2(2\pi/8d)$

For equality $2dim[SU(5)] = dim[SU(7)]$; and the equality : $dim[SO(7)] = 7d \times 3d$; $7d + 3d = 10d$;and considering that the maximum amount of particle-antiparticles of vacuum is : $240 = 1/\zeta(-7) = 1/(2\zeta(-3))$

Where, -7 and -3, are the total of negative value of the squares of the octonions and quaternions.

The above statement implies directly dimensional compactness as torus, having at most 7 dimensions compacted as the volume of a torus 7d, is equivalent to the surface of a sphere 8d. In turn, the maximum amount particles-antiparticles of the vacuum, are the maximum amount of hyperspheres in mutually touching to a central , 8d, 240.

Therefore, the calculation of the mass of Higgs lighter as a direct function of the square of the density of a string dimension 7, using the length of the string with a value of :

$$l_P(D)/l_P = \frac{\left(\hbar G_{d+4} \Big/ c^3\right)^{1/(d+2)}}{\left(\hbar G_N \Big/ c^3\right)^{1/2}} = \left(2(2\pi)^d \Big/ \left[2\pi^{d/2}/\Gamma(d/2)\right]\right)^{\frac{1}{d+2}}$$; $l_p(7d)/l_p$; assures us that the value of the mass of the lightest Higgs boson is correct, perhaps counting a small effect of correction for the angle CP violation δ_{13}

The smaller radius of the torus will be using the Kaluza-Klein circular compactification :

$$R_P(D)/l_P = \left(4(2\pi)^d \Big/ (d+1)\left[2\pi^{d/2}/\Gamma(d/2)\right]\right)^{\frac{1}{d+2}}$$

The product $-7 \times -3 = 21$; represents all possible positive value of the relativistic energy equation, taking into account the compactification to 8d, with holography in 7d (torus)

In fact: $\sqrt{p^2c^2 + m^2c^4} = E$, compacted into a space, we have the following number of standard solutions with the octonions: 4 dimensions, $\{e_1^4, ..., e_7^4\} = \{1, 1, 1, 1, 1, 1, 1\}$; $\{(-e_1)^4, ..., (-e_7)^4\} = \{1, 1, 1, 1, 1, 1, 1\}$

To 8 dimensions: $\{e_1^8, ..., e_7^8\} = \{1, 1, 1, 1, 1, 1, 1\}$; $\{(-e_1)^8, ..., (-e_7)^8\} = \{1, 1, 1, 1, 1, 1, 1\}$

In total there are 28 states: $28 = dim[SO(8)]$

These states have to subtract the negative energy, given by: $\{e_1^2, ..., e_7^2\} = \{-1, -1, -1, -1, -1, -1, -1\}$

Finally having a total of: $28-7=dim[SO(7)]=21$

Being the number of states-particles, the integer part of the inverse of the baryon density of the universe must be precisely 21: $21=\left\lfloor \Omega_b^{-1} \right\rfloor = \left\lfloor ((240.09168122877-240)/2=0.045840614385)^{-1} \right\rfloor = \left\lfloor 21.81471635 \right\rfloor$

Its fractional part is a function of dimensionless factor value of model uncertainty of a particle in a box and the commutator of canonical Heisenberg expression , assuming the principle of equivalence that develop later.

Finally we have: $\Omega_b^{-1}=dim[SO(21)]+\sqrt{(\frac{2\Delta x\Delta p}{\hbar})^4-(\frac{xp-px}{\hbar})^4}$; $(\frac{2\Delta x\Delta p}{\hbar})^4=(\frac{\pi^2}{3}-2)^2$; $(\frac{xp-px}{\hbar})=i$

$\Omega_b^{-1}=dim[SO(21)]+\sqrt{(\frac{2\Delta x\Delta p}{\hbar})^4-(\frac{xp-px}{\hbar})^4}=21.81471455$

Reconciliation with general relativity is, among other things, that the quantum curvatures are precisely the densities of baryons, vacuum energy and dark matter.

Effectively, as we saw in our previous work(God and His Creation: The Universe), there is, that by using string length derived from the fine structure constant:

$\Omega_b^{-1}=2l_\gamma^2/\cos\delta=2l_\gamma^2/\cos(\theta_{13}/8)$

Where δ is the angle of violation, CP, depending on the eight states of polarization of the photon for each of the three dimensions. Angle very close to the CKM matrix of quarks.

θ_{13} is the mixing angle of neutrinos, whose value conjecture, with some confidence, which is: $\theta_{13}=\arccos(\sqrt{R(7D)/l_\gamma})/2$; $R(7D)=2.95694905822$ (smaller radius compacted torus 7d).

Being the integer part of the inverse of the fine structure constant, 137, a direct function of the sum of the possible states of polarization of the photon for 7, 3 and the time dimension.

$\left\lfloor \alpha^{-1} \right\rfloor = 2^7+2^3+2^0=137$

2.2.2 Principle of equivalence mass-space-time

The concept that is exactly the mass, not well defined, in our opinion.

Mass is a physical entity which is not known its exact nature. Definitions such as that is the resistance of a body movement, just do avoid deeper understanding of the mass, but its character of being a scalar quantity.

There are several apparent paradoxes and inconsistencies in quantum mechanics that would be resolved if one considers that the quantum-mechanical phenomena are actually the manifestation of a single unitary physical entity, with a descriptive correspondence by mathematics.

In fact, everything would be reduced to pure geometry, topology, with its invariants, groups, etc.

Moreover, we think that a string theory will require extensive use of all the math.

Number theory, for its performance characteristic of being a pillar foundation of mathematics, will surely play a role.

This character unit would solve, for example, the apparent paradox of action at a distance and the collapse of the wave function. Likewise, we would resolve the inconsistency of the sum of infinite paths with a finite dimensional quantization.

If space-time-mass is a physical entity in itself, and perhaps not separable and switchable in the sense that they are interchangeable or exchangeable space, time and mass.

If this were so, it should consider both the mass, space and time are in fact dimensions of a space whose metric, invariant, transformations, etc., know its exact nature.

The space and time and were unified by special relativity, treating time as a dimension more.

We believe that if the mass is treated as a dimension compacted, would explain his character scale, on large scales. Only at very small scales of the order of the Planck length, their true nature appear dimensional.

The key to this mystery may lie precisely in the core foundation of quantum mechanics. Specifically, two key results:

1. The well-known model of a string vibrating in one dimension, or n dimensions.
2. The study of the commutability of the mass in the fundamental expression switch Heisenberg uncertainty principle.

2.2.3 Switchability of mass in the equation of the commutator of the Heisenberg uncertainty principle.

The singularity of the photon particle, which allows the disintegration of any particle-antiparticle pair in a pair of photons, or a photon, when virtual particles, along with obtaining the value of the baryon density of the universe, break the vacuum at its photonic and electronic, obtained in our previous work, we reaffirmed the idea that nature has two reference mass scales, namely the Planck mass, as the upper limit, and the mass of electron, because the charged particle less massive and stable, does not interact with particles. Besides being linked to the emission and absorption of photons. As the photon its own antiparticle, it seems perfect to describe the particle vacuum. Thus we consider the vacuum studying these particles that travel at the speed of light, and therefore its speed is fully determined,

The fundamental equation switch Heisenberg uncertainty refers only to the space and time, but says nothing about the commutability of the mass or separately, independently.

Since the switch expression appears to be invariant Heisenberg commutation of the mass relative to the spatial coordinate, then we can lead to the conclusion that the mass is switched with the dimension of the spatial coordinate. We do not have to worry about speed, since we are dealing with photons, and therefore knowledge of its velocity is completely deterministic.

And although its value, the Heisenberg switch is the same, it is not the nature of the permutation. Put another way: the permutation of the mass (at rest, regardless of speed) would be a turn or exchange with the spatial dimension. In this case, this shift could well be interpreted as a compactification circle. Since the mass is a "scale", we can switch the mass relative to the speed, or with respect to the coordinate space (the coordinate space velocity), leaving invariant the position of the speed, totally determined, c

Be the Heisenberg switch:

$xp - px = i\hbar$

The commutations of the above equation, would be four:

$x \cdot mc - mc \cdot x = i\hbar$; $x \cdot mc - cm \cdot x = i\hbar$; $x \cdot cm - cm \cdot x = i\hbar$; $x \cdot cm - mc \cdot x = i \cdot \hbar$

A total of four turns or commutations that leave invariant the space-time commutator.

We can perfectly interpret these four different states, but of equal value, as dimensions of a state space: the space of states of mass commutator-speed spatial coordinate of the moment. These four states can represent a full rotation of a circle, ie: a compactification of one dimension.

Since these commutations stop the commutator of Heisenberg invariant space-time, we can write the following equations:

$(x \cdot mc - mc \cdot x)/\hbar = i$; $(x \cdot mc - cm \cdot x)/\hbar = i$; $(x \cdot cm - cm \cdot x) = i$; $(x \cdot cm - mc \cdot x)/\hbar = i$

$i^4 = ([Am, mB]/\hbar) \cdot ([mA, mB]/\hbar) \cdot ([mA, Bm]/\hbar) \cdot ([Am, Bm]/\hbar)$ (1) ; $m = mass$

$Am = mA = xp_x$, $Bm = mB = p_x x$

Now, for the switch antisymmetric, we have: $[p_x, x] = -i\hbar$

This will have four other states unified in the analogous expression given by (1):

$(-i)^4 = i^4 = 1 = i^8$ (2)

x	m	c	-	m	c	x
x	m	c	-	c	m	x
x	c	m	-	c	m	x
x	c	m	-	m	c	x

m	c	x	-	x	m	c
m	c	x	-	x	c	m
c	m	x	-	x	c	m
c	m	x	-	x	m	c

antisymmetric commutator

The two tables above show as obtained 16 states, 8 positive mass (left side of the two tables) and other mass 8 "negative" (right side of the two tables).

Samples in both tables by mass change space between the commutator and antisymmetric. Colored.

Here is where the equivalence to the group SO(16). dim [SO (16)] = dim [SU(11)].

Strictly, since the relation of the canonical commutator does not distinguish between the spatial coordinate and mass. This forces us to admit the possibility that mass is a dimension equal to the space and time. Its scale module, would by its compactness.

It is the observer perceives how different the three observables, most likely by changing the scale of observation and the demonstration of "ruptures" of symmetry, as a result of this change of scale. Thus, for the breakdown of entanglement by the interference of the measure of the observer.

If these states are extended to the canonical relation of the switch for the three space coordinates and with antisymmetric states of the switch, you have a total of 24 states.

In general: as, d, the number of dimensions have the following number of states:

$8d = n_+(d)$; $counting\ states\ of\ antimatter:$ $16d = n_{+-}(d)$

The ground state is considered as: $8 \cdot 3 = 24 \rightarrow SU(5)$

Counting antimatter: $8 \cdot 2 \cdot 3 = 48 \rightarrow SU(7)$

The following table summarize all states, highlighting specials, ie those who are a group SU(d) or a multiple of a group SO(d)

$8 \cdot 3 = 24 = n_+(3) \rightarrow SU(5)$
$8 \cdot 2 \cdot 3 = 48 = 2dim[SU(5)] = n_{+-}(6) \rightarrow SU(7)$
$8 \cdot 4 = n_+(4) = 32 = 2^5$
$8 \cdot 5 = 40 = n_+(5) = K(5d)$
$8 \cdot 7 = n_+(7) = \sum_{d=2}^{7} SO(d) = 2dim[SO(7)] = 56$
$16 \cdot 7 = n_{+-}(7) = 112 \rightarrow roots\ with\ integer\ entries\ E8$
$16 \cdot 4 = n_{+-}(4) = 64 = n_+(8) \rightarrow SU(4) + SU(7) + U(1)$
$128 = 2^7 = n_{+-}(8)\ ;\ n_{+-}(8) + n_{+-}(1) + [n_{+-}(0) = 2^0] = \lfloor \alpha^{-1} \rfloor$
$8 \cdot 9 = 72 = n_+(9) = 3dim[SU(5)] = K(6d)$
$8 \cdot 10 = 80 = n_{+-}(5) = n_+(10) \rightarrow SU(9)$
$8 \cdot 11 = n_+(11) = 88$
$16 \cdot 11 = n_{+-}(11) = 176$
$2 \cdot 11 = 22 = 11 \cdot n_{+-}(0) = 11 \cdot 2 \cdot 2^0$

The choice of the photon is adjusted to the states, so that the states are a direct function of the states of polarization of the photon for three and four dimensions. $2^3 = n_+(1)\ ;\ 2^4 = n_{+-}(1)$

The space-time-mass appears to behave as a form of quantum computation.

Immediately understood, as the integer part of the inverse of the fine structure constant, is the sum of the photon polarization states for seven, three and zero dimensions.

The above table has very special value, which would be:

$8 \cdot 4 = n_+(4) = 32 = 2^5 \rightarrow \left\{\widetilde{\chi_1}^0, ..., \widetilde{\chi_4}^0\right\} \cup \left\{\widetilde{\chi}_1^+, \widetilde{\chi}_2^+\right\} \cup \{\widetilde{e}_{\overline{R}}, \widetilde{e}_{\overline{L}}, \widetilde{\nu}_e, \widetilde{\mu}_{\overline{R}}, \widetilde{\mu}_{\overline{L}}, \widetilde{\nu}_\mu, \widetilde{\nu}_\tau\} \cup \{\widetilde{\tau}_1, \widetilde{\tau}_2\} \cup$

$\cup \left\{\widetilde{u}_R, \widetilde{u}_L, \widetilde{d}_R, \widetilde{d}_L, \widetilde{s}_R, \widetilde{s}_L, \widetilde{c}_R, \widetilde{c}_L,\right\} \cup \left\{\widetilde{b}_1, \widetilde{b}_2\right\} \cup \left\{\widetilde{t}_1, \widetilde{t}_2\right\} \cup \left\{m_h, m_A, m_{H_0}, m_{H^+}, m_{H^-}\right\} = \{n_+(4)\}$

$8 \cdot 7 = n_+(7) = \sum_{d=2}^{7} SO(d) = 2dim[SO(7)] = 56 \rightarrow \{n_+(3)\} \cup \{n_+(4)\} = \{n_+(7)\}$

$\{\mathbf{n_+(3) + 5H}\} = \left\{\mathbf{6\ quarks, 6\ leptons, 8\ gluons, 9\ Bosons}\ (\mathbf{w^+, w^-, Z}, \gamma, \mathbf{h, A, H_0, H^+, H^-})\right\}$

$\{n_+(7) + 5H\} = [(6 + 0i)(6 - 0i) + (5 + i)(5 - i)] = 61\ \ 6d + 5d = 11d\ ;\ 6d \cdot 5d = 1^2d + 2^2d + 3^2d + 4^2d$

$(6 + 0i)(6 - 0i) + (5 + i)(5 - i) = (6 + 0i)(6 - 0i) + (2 + i)(2 - i)(1 - 2i)(1 + 2i)$

$1d \cdot 2d \cdot 3d \cdot 4d = 4d! = 24d \rightarrow SU(5)$

And here appears the group of permutations of 4 dimensions and the group SU (5), with 4 being the uncertainty principle observables, space, time, speed and mass.

The factorization of dimension 5, of $SU(5) = SU(3) \times SU(2) \times U(1)$; and the relation (2) forces us to consider negative states given by (equivalent to states of negative energy) inversion of time, ie: make it negative.

It is to point out that it is considering the virtual vacuum. That is, a space where the particles are not observable, and therefore the uncertainty principle corresponds to what we are describing. But this well determined experimentally (Casimir effect, etc, etc) that although the virtual particles are not observable, if they produce measurable effects.

If we include inversion of time, exclusively for the Heisenberg uncertainty relation given by: $\triangle E \triangle t \geqq \hbar/2$

If we extend the three space coordinates, so that three-dimensional space to expand in all three coordinates, it will have three states of negative energy. And we think we say well, since an expansion, as actually happens in the universe, is considered a negative pressure and thus a negative energy.

$-\triangle t_x \triangle E \geqq -\hbar/2$; $-\triangle t_y \triangle E \geqq -\hbar/2$, $-\triangle t_z \triangle E \geqq -\hbar/2$

The total sum of states will then: $24 - 3 = 21 = dim[SO(7)]$

In this way is changed $8 \cdot 3 = 24$; $8d + 3d = 11d$; by $7 \cdot 3 = 21$; $7d + 3d = 10d = 5d + 5d$

The dimensional factorization in two copies of five dimensions, allowing the "break" of

non-dimensional factorization of 11 dimensions, since it is a prime number is not yet factorizable by the Gaussian integers. In contrast, 5 dimensions, but is a prime number, it is not in the Gaussian integers, because: $5d = (2+i)(2-i)$; $5d = (2i+1)(-2i+1)$

The Gaussian integers can have a fundamental role, since they offer two very interesting properties from the point of view of a physical theory. On the one hand allow the expression of spherical coordinates by complex numbers, which in turn implies, apparently a mixture of compacted and uncompacted state. On the other hand allows the factorization of integers prime numbers that are not in the set of integers. This may mean breaking of symmetry for factorization in the integers, while the factorization of uncertainties.

The primes have to play a key role, as will be seen later, the quantum entanglement.

Definitely, there are toric compacted as 7 dimensions (sphere of 8 dimensions), we propose as dimensions that correspond to the mass-space. Four dimensions are not compacted, that quantum entangled at the moment. obey the canonical relation of the switch.

If the particles are not observable, we know, neither his position nor his time.

This could mean, perhaps, the commutability of space, time and mass. In other words: non disntinguibilidad between space. time and mass. Would be interchangeable, would form an interlacing of a single entity physico-mathematical.

2.2.4 Application of the scaling law to the relationship canonical Heisenberg commutator

The two copies of 5 dimensions generates two copies $2dim[SU(5)] = SU(7)$

Apply scaling to the switch canonical, and its antisymmetric commutator:

$d([x,p_x]/\hbar)\Big/([x,p_x]/\hbar) = i$; $d([p_x,x]/\hbar)\Big/([p_x,x]/\hbar) = -i$

If we integrate and use the self-adjoint operators, for the sum of "states", we have:

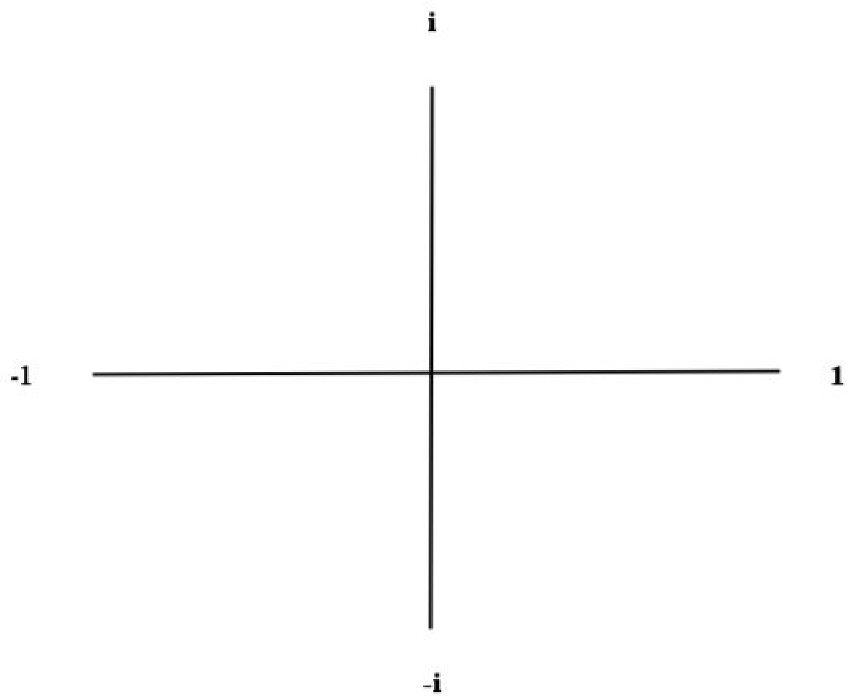
(3) $\left(\int d([x,p_x]/\hbar)\Big/([x,p_x]/\hbar) + \int d([p_x,x]/\hbar)\Big/([p_x,x]/\hbar)\right)\Big/ 2 = (\exp i + \exp -i)/2 = \cosh i = \cos(2\pi/2\pi)$

For the "difference" of states:

(4) $i\left(\int d([x,p_x]/\hbar)\Big/([x,p_x]/\hbar) - \int d([p_x,x]/\hbar)\Big/([p_x,x]/\hbar)\right)\Big/ 2 = i(\exp i - \exp -i)/2$; $i \sinh i = \sin(2\pi/2\pi)$

Multiplying the relation (4) by i, which is being done is to complete a turn from the relation (3), through (4), so that for the four differentials, we have: $i, -i,\ i \cdot i,\ , i - i$

In conclusion:



It is thus that the application of scale change to the two canonical switches, as the sum of average states, results in a dimension compactification and 11, in reverse, as only the number 11 has the property such that : $2\pi/11 = 0.5711986643... \simeq 0.570796327... = (\pi/2) - 1$;

$2\pi/((\pi/2) - 1) = 11.0077537$; So it has: $\cos(2\pi/11) \simeq \sin(2\pi/2\pi)$; $\sin(2\pi/11) \simeq \cos(2\pi/2\pi)$

The relations (3) and (4) indicate a turn in hyperbolic space, except that to make it effective, it is necessary to introduce an imaginary operator within hyperbolic compactification, which corresponds to a rotating vertical axis. Normalized to unity with respect to the Planck length, there are finally two rotational coordinates, admitting the conjugate:

$$\left.\begin{array}{l} \boxed{x_1 = \cosh i + i \sinh i = (\cos 1 + \sin 1) \simeq (\sin(2\pi/11) + \cos(2\pi/11))} \\ \boxed{x_2 = \cosh i - i \sinh i = (\cos 1 - \sin 1) \simeq (\sin(2\pi/11) - \cos(2\pi/11))} \end{array}\right. \quad (5)$$

The two coordinates obtained by (5) have the following property: $\cosh i = \cosh(1/i)$; $-i \sinh i = i \sinh(1/i)$

These two properties, obvious, suggest a kind of duality similar to T-duality of string theory.

A type T duality similar to that of string theory, is obtained directly from the observation that the ratio of the compacted mass Kaluza-Klein type, in circles, we have:

$$m_p/m_p(d) = \frac{\left(\hbar G_{d+4} \Big/ c^3\right)^{1/(d+2)}}{\left(\hbar G_N \Big/ c^3\right)^{1/2}} = \left(2(2\pi)^d \Big/ \left[2\pi^{d/2}/\Gamma(d/2)\right]\right)^{\frac{1}{d+2}} \quad m_p/m_p(d) = (l_p(d)/l_p)^{-1} \; (6)$$

It shows string theory, with its compact expression for the mass, the mass acts as a reverse dimension to the space dimension. And this mass is always greater than the Planck mass, to avoid inconsistencies.

Relation of the mass of the string theory: $m^2 = \frac{n^2}{R^2} + \frac{w^2 R^2}{\alpha'^2} + \frac{2}{\alpha'}(N + \widetilde{N} - 2)$ (7)

The number of times that the closed string wraps around that dimension is called the winding number w. Where N and $\tilde{N}$ are the excitations for the left- and right-movers of the closed string, and Îś' is the slope parameter. This spectrum is invariant under the interchange $R \longleftrightarrow \alpha'/R \;\; n \longleftrightarrow w$

Here are some interesting empirical relationships:

- Taking only the main part of (7). $11^2/l_p^2(11) = 11^2/3.95612456659^2$
- $(7 \cdot l_p^2(11)/11^2)^2 + dim[SO(21)] = dim[S0(6)](1 + \cosh i \cdot i \sinh i) \approxeq \Omega_b^{-1}$ (8)
- $R_p(7) = 2.95694905822 \;\; ; \;\; (7^2/R_p^2(7)) - \sqrt{15} + 6 \approxeq 11^2/l^2(11d) = 11^2/3.95612456659^2$
- $6 \equiv_{s=2} (s+1)s$
- $l_p(8) = 3.292297488 \;\; ; \;\; P(2, l_p(8d)) = \sin^2(2\pi/l_p(8))(2/l_p(8)) = 0.5408122436 \approxeq \cos(2\pi/2\pi) = 0.5403023059$
- $1/[\cos^2(2\pi/l_p(8)(2/l_p(8))] = 15.00008819 \approxeq 15 = \sum_s 2s + 1 = dim[SU(4)] = dim[SO(6)] \; ; \; 6 \cdot 4 = 24 \; ; \; 6 + 4 = 10d$
- $l_p(7) = 3.0579009561 \;\; ; \; -\cos(2\pi/l_p(7)) = 0.4652718269 \approxeq 0.4652576133 = (\pi^2\sqrt{2})/30 = \rho(5d)$
- $(\pi^2\sqrt{2})/30 = \rho(5d)$ (packings of spheres density in five dimensions)

Where: $(1 + \cosh i \cdot i \sinh i) = \int (\cosh i + i \sinh i)(\cosh i - i \sinh i) di$

This last expression we interpret as the integral of a surface (hyperbola parametric equation or light cone), whose inverse is a quantum curvature, derived from the principle of equivalence mass-time-space, as a function of angle of rotation i

He had 21 and 24 states, by the application of the principle of equivalence mass-space-time,

as the difference between the 24 states positive and 21 negative, 3: $(3/(21+24))^{-1} = 15 = dim[SO(6)] = \sum_s 2s + 1$; As a mixture of states: $21 + 24 = dim[SO(10)]$

$dim[SO(6)] = dim(dim[SO(4)]) \quad dim[SO(10)] = dim(dim[SO(5)])$

$dim[SO(5)] \cdot dim[SO(4)] = dim[SU(11)]/2 = dim[SO(10)] + dim[SO(6)]$ (9)

The angle β used in calculating the mass of Higss boson, depending on the model MSSM, we will demonstrate later with more precision, is $(\pi/2) - (2\pi/dim[SU(11]/2) \longleftrightarrow 84^\circ$

The total number of particles in the vacuum, less antimatter: $dim[SU(4)] \cdot dim[SU(3)] = dim[SU(11] = \zeta^{-1}(-3) = dim[SO(16)]$

Where: $dim[SU(4)] = dim[SO(6)]$ seems to correspond to the space of rotations of the 6 canonical switching operators, with the antisymmetric, of the three spatial coordinates. In turn equivalent to the group SU (4), the four commutations of the mass for a single operator canonical switching. And SU (3) would correspond to the 8 switching states of mass for the two canonical operators switching, counting the antisymmetric. Correspondence with the quaternions and octonions and four, eight dimensions: $4 \longleftrightarrow \{i, j, k, 1\} \;\; 8 \longleftrightarrow \{e_o, ..., e_7\}$

2.2.5 Possibility of reality the principle of equivalence mass-space-time

The value of the Heisenberg uncertainty principle of the ground state, n = 1, derived from the model of a string in one dimension is:

$(\triangle x\triangle p)/\hbar = (1/2)\sqrt{\frac{\pi^2}{3} - 2} \rightarrow [(2\triangle x\triangle p)/\hbar]^8 = (\pi^2/3 \ \ -2)^8$

$(\pi^2/10)^{1/8}(\pi^2/3 \ \ -2)^8 \approxeq 2(\cosh i + i\sinh i)\ (10) \quad (\pi^2/10)^{1/8}(\pi^2/3 \ \ -2)^8 = 2.76355888356703$

$2(\cosh i + i\sinh i)\ (10) = 2.76354658135207$

If indeed the principle of equivalent mass-space-time is fulfilled in vacuum, and therefore, at a length scale 11 appears compactifiacion dimensional, then satisfy the relationships (3), (4) and (5) .

The factorization dimensional uncertainty principle, taking into account the principle of equivalence, and the natural symmetry breaks that arise, SU (5), SU (7), SU (3), SU (4), SU (8), SU (2), U (1), and SU (11), lead to the factorizations by sum of the dimensions of the groups SU (n), as follows:

(11) $\triangle^4 x_1 \triangle^4 m \triangle^2 x_2 \triangle^{-1} x_t$, Where $\triangle^1 x_t$ represents the time coordinate.

And $\triangle^2 x_2$; represents the spatial coordinate of the velocity, which has to be squared, to preserve the dimensional sum : $4+4+2+|-1| = 11$

Apparently appears a contradiction, since the amount of movement is dimensionally the following expression, admitting the principle of equivalence: $\triangle^4 m \triangle^2 x_2 \triangle^{-1} x_t$

But this may not be strictly correct, if we admit that space-time-mass is actually fluctuating waves, vibrations n dimensional, which thus produce a curvature, undulation, according to general relativity. This curvature is precisely what the term would appear as $\triangle^2 x_2$

We have shown previously as the introduction of a quantum curvature, to calculate the density of baryons in the universe.

The dimensional relationship (11) has interesting properties:

Be the representation given by the number of dimensions: $4, 4, 2, 1$

- $4 \cdot 4 \cdot 2 \cdot 1 = 32 = 2^5$; This number is important, as is the maximum possible number of supercharges if the space-time-mass is precisely 11 dimensions.
- $4! = dim[SU(5)] \quad (4! + 4! = dim[SU(7)]) + 2! + 1 = \lfloor \ln(m_p/m_e \rfloor = 51$
- the dimension of moment: $4+2+1 = 7$
- The dimension of energy by time: $4+4+2 = 10 = 2 \cdot 5H$ (five Higss bosons)
- $4! \cdot 4! \cdot 2! \cdot 1! - \cos(2\pi/7) \approxeq (8\pi^2/3) l_p^4(5) = 1151.376974$ (Volume torus 5d). Where $l_p(5)$ is the lenght Planck in five dimensions. $l_p(5) = 2.571800436 \quad 4! \cdot 4! \cdot 2! \cdot 1! - \cos(2\pi/7) = 1151.37651$
- $P(2, x_1 = x_2 = x_3 = x_4 = x_5 = l_p(5d)) = [(2/l_p(5d))\sin^2(2\pi/l_p(5d))]^5 \quad \delta_5 = 2\pi P(2, x_{1,..,5}) \approxeq \delta_c \approxeq 1.2^\circ$

$(2 + (2\pi/11))/\cos\delta_5 \approxeq l_p(5)$

$([(\sqrt{4} + \sqrt{3} + \sqrt{2} + \sqrt{1})/10] + 6)^{1/2} = 2.571891607 \approxeq l_p(5d) \quad 1 \cdot 2 \cdot 3 \cdot 4 = dim[SU(5)] \quad 1+2+3+4 = 10d$

$(1^2 + 2^2 + 3^2 + 4^2) \cdot 4 = dim[SU(11)]$

- $4^2+4^2+2^2+1^2=(6+i)(6-i)\approxeq \ln(m_p/m(susy))$
- $3+5+7+11=26=(5+i)(5-i)$; $3\cdot 5\cdot 7\cdot 11-3=4!\cdot 4!\cdot 2!\cdot 1!$ $\sqrt{(3^2+5^2+7^2+11^2)/4}=4!+4!+2!+1!$

If we want to preserve the dimensionality of the Heisenberg uncertainty principle for speed, you should consider that the dimension four for mass and space, is actually the dimension of the volume of a torus in five dimensions. Therefore, the dimensionality ordinary uncertainty principle is restored by: $\triangle^5 x_1 \triangle^5 m \triangle^1 x_2 \triangle^{-1} x_t$

Thus, the sum of the powers dimensional $5+5+1-1=10D$

Thus, the mass is of dimension 5 (reduced to 4 by the compactification on a torus). space also has dimension five, preserving the dimension seven, for the moment.

This dimensional structure has the following properties, analogous to the scheme 4,4,2,1

1. $5!5!1!1! \approxeq [R(5)+10]V(T5D)\cdot l_p^4(5)\ +\sqrt[4]{\pi/5}$; where $R(5)=\sqrt{2\pi}$ is five-dimensional torus minor radius. $V(T5D)=(8\pi^2/3)$ is volume factor of five dimensional torus.
2. $[R(5)+10]=12.50662828 \approxeq \sum_s (s+1)s$; $s=spin$
3. $5^2+5^2+1^2+1^2=\lfloor \ln(m_p/m_e\rfloor+1=dim(F4)$
4. $5!+5!+1!+1!=11^2\cdot 2$
5. $5\cdot 5\cdot 1\cdot 1=25=2\cdot\sum_s (s+1)s$

Again the principle of equivalence, establishes a correspondence: $5d \longleftrightarrow \sum_s s \longleftrightarrow 5H$

$mc^2t \longleftrightarrow 10d \longleftrightarrow 10H \longleftrightarrow 10$ terms to complete an operation that converts a single supersymmetry particle, a Higgs boson, for example, a graviton, covering all the spins.

The dimensional factorization

Of the five prime numbers with which they can break the symmetry in eleven dimensions by groups SU (n): 2, 3, 5, 7, 11, only the number of dimension five is factorizable in the gauss integers, and thus the ten dimension is also factorizable , which, except for the same 10, has eleven factors in the Gaussian integers.

The factorization of 5d in the Gaussian integers: (2 + i) (2-i), (1-2i) (1 +2 i)

This factorization allows us to obtain the minimum uncertainty value 1/2, or the minimum value of the spin jump, with the following relationships:

1. 2 dimensions $\sin(1/(1+i))\sin(1/(1-i))=0.50138916447355$
2. 10 dimensions, (1+i)(1-i)(2+i)(2-i)=(3+i)(3-i)=10 : $[\sin(1/(3+i))\sin(1/(3-i))]/[\sin(1/(2+i))\sin(1/(2-i))]=0.50662990925681$
3. 8 dimensions: 8= (2+2i)(2-2i), $4\cdot\sin(1/(2+2i))\sin(1/(2-2i))=0.50008680663202$

The variance of the space dimension to the model of a vibrating string in one dimension is:

$Var(l) = (l^2/12)(1 - \ 6/\pi^2)$ And this variance must be expressed by: $Var(l) = (l^2/12)(120/\pi^5)$; where, $\pi^5/120$; is the volume of a sphere of 10 dimensions normalized to the unit, or with respect to the Planck length $l = l_p/l_p$; where: $l^2 = (l^{10})^{1/5}$ One might find a match factor 12 as equivalent to the twelve states of the mass switch to three dimensions, but not the value of their antisymmetric. Dimensional symmetry breaking by 5,5,1, 1, which we have previously shown, would be consistent if one considers 10 mass value switching to a rupture of symmetry with two copies of SU(5), 5-dimensions, adding, and two for the remaining dimensions, space-time. That is $(2 \cdot 5 = 5 + 5 + \ 2 \cdot 1) = 12 = 6 \cdot 2$

For the variance of the moment of a string oscillating in one dimension, we have the following factor: π^2 There is only one possibility to obtain dimensionally quadratic factor, the product of the variance of moment and position. The factor π^2 , would correspond to the volume of a 5-dimensional sphere, such that: $(8\pi^2/3)(dim[SU(4)])^{\frac{1}{5}}\Big/ dim[SU(3)]) = \pi^2$

$dim[SU(4)]dim[SU(3)]dim[U(1)] = dim[SU(11)] = 120$; $4 \cdot 3 \cdot 1 = 12$; $4 + 3 + 1 = 8 = 4 + 4$

$dim[SU(4)] + dim[SU(3)] + dim[U(1)] = dim[SU(5)]$;$dim[SU(4)] = dim[SO(6)]$

Definitely has to be the breaking of symmetry and the manifestation of supersymmetry should occur in 5-dimensional strings. This symmetry breaking is produced by the splitting of the group $dim[SU(7)] = 48 = 2dim[SU(5)]$; $\{n_+(7)\} = 2dim[SO(8)]$

For the group$SU(7)$; will have 48 states, which have to subtract 3 from negative energy, fulfilling: $dim[SU(7)]{-}3 = dim[SO(10)]$ The basic group for mass switching states of a single canonical operator: $dim[SU(4)] = 15 = \sum_s 2s+1 = (3/45)^{-1} = dim^{-1}[SO(6)]$

$dim[SO(6)] + dim[SO(10)] = dim[SO(5)]dim[SO(4)] = 60 = dim[SO(16)]/2 \ \sum_{d/24} d = 60$

The angle $\beta = 2\pi/dim[SO(SO(4))] \ \ + \ 2\pi/dim[SO(4)] \ \to 84°$

$dim[SO(10)] = dim[SO(SO(5))]$; $dim[SO(SO(4))] = dim[SU(4)] = 15 = \sum_s 2s + 1 = (3/45)^{-1} = dim[SO(6)]$

$\Omega_b^{-1} \approxeq (\sum_s 2s + 1)(1 + \sin(2\pi/2\pi)\cos(2\pi/2\pi))$

The matrix generated by the commutation of the mass in a single switch, 4, produces the maximum number of possible states, which is a direct function of the states of polarization of the photon to four dimensions: 2^4

These states can be considered fully equivalent to virtual photons which disintegrate into particle-antiparticle pairs, so the baryonic density should be also expressible as a function of 2^{-4} In fact: $\Omega_b \approxeq (2^{-4})/(\sin(2\pi/2\pi)\cos(2\pi/2\pi)\cos\theta_{13})$

The ratio baryons-antibaryons difference with respect to the number of photons, can be expressed by applying the change of scale, such as: $\cos(2\pi/2\pi)\Big(d([\overline{nb} - nb]/n\gamma)\Big)/(\overline{nb} - nb)/n\gamma = -\Omega_b^{-1}$

$\cos(2\pi/2\pi) \approxeq (\triangle x \triangle p)/\hbar \approxeq \sin(2\pi/11)$

Integrating, have: $\cos(2\pi/2\pi)\int\Big(d([\overline{nb} - nb]/n\gamma\Big)/(\overline{nb} - nb)/n\gamma = -\Omega_b^{-1}$

Finally: $(\overline{nb} - nb)/n\gamma = \exp -(\Omega_b^{-1})/\cos(2\pi/2\pi) = 6.21368 \cdot 10^{-10}$ (12)

Value in excellent agreement with experimental observations.

Uncertainty in the extra dimensions The dimensional scheme of the eight switches of the mass is split between space and mass dimensionally as: $\triangle^4 x \triangle^4 m$; speed is not necessary, first that is fully determined, c, and second that uncertainty has been isolated that corresponds only to the space as an entity mass interchangeably.

To preserve the minimum value of the uncertainty principle, 1/2, and space and mass being interchangeable, necessarily have to comply: $(\triangle x \triangle m)^4/\hbar c \geqq (2^{-1/4})$ (13)

The above relationship is to be understood as mass-space are intertwined.

When the break of symmetry, for $2dim[SU(5)]$; there is space-mass separation, and the minimum uncertainty is given by: $\triangle^4 x/x^4 = \Delta^4 m/m^4 = 2^{1/8}$ (14)

The relation (14) immediately implies that the constant of Newton gravitation does not vary over time because: $G_N \triangle m_p/\triangle l_p = c^2$

A result derived from the previous relationship of uncertainty: $2\Omega_b \approxeq 2^{-1/8}/10$

You get an accurate result, if you enter an angle of CP violation, equal to :

$\delta_8 = \theta_{13}/8 = 9.433531269°/8$; thus we have: $(\cos\delta_8 2^{-1/8})/10 = \ 2\Omega_b = 0.09168098429$

Where, he division by ten. comes from the partition of the density by the number of dimensions "static" because the other two dimensions are the observable velocity, c, fully deterministic (virtual photons)

$(2^{-1/4}) \approxeq sin^4(2\pi/2\pi) \approxeq \cos^4(2\pi/11) \approxeq \left(1 - \sin^4(2\pi/l_p(8))(2/l_p(8))^2\right)^4 = (1 - P^2(2, l_p(8))^4$

Where: $P(2, l_p(8)$ is the probability of a one-dimensional string length of the eight dimensional length (Planck Kaluza-Klein), and a minimum value given by the zero point energy.

If you enter all the states of the matrix, 4×4 ; then the uncertainty space-mass has a value that comes from the relationship: $(\triangle x \triangle m)^{16}/\hbar c \geqq 1/2^{1/16} \rightarrow min_{16}(\triangle x \triangle m) = 2^{-1/16}$

The previous relationship, would explain the reduction of 26 dimensions to 10, more time. The space-time-mass breaks its initial symmetry, reducing its size, by compactness in 11 dimensions, with minimum uncertainty allowed for the matrix of the 4 operators base.

We will see, below, that this result has direct practical effects for the calculation of the value of the Higgs field vacuum, or its equivalent, the Fermi constant.

The scaling of the canonical switches as a dimensionless ratio has its equivalent in the model of a particle in a spherically symmetric potential, as we showed in our previous work, (pg 70-71God and His Creation: the Universe).

For this model, by the principle of equivalence between spins, as purely dimensional states, is caused by scaling of the spins, a vacuum contribution that depends on these spins, the probabilities of a string of dimension five, and the lengths of five compacted dimension (Kaluza-Klein), with a smaller radius and a larger one corresponding to a torus.

The spins, the change of scale, the model of spherically symmetric potential: Calculating the value of the Higgs vacuum The virtual vacuum of the Higgs field of spin zero, occurs with equal probability particle-antiparticle pairs of any spin.

We can think of virtual processes in which a virtual Higgs boson generates a particle-antiparticle pair of any spin. If there are five bosons, the minimum number of particle-antiparticle pairs of any spin, generated with equal probability for the five bosons H, will be ten. $10d \longleftrightarrow 2\sum_s s \longleftrightarrow 2 \cdot 5H \longleftrightarrow supersymmetry\ operation\ (2SO)$

$2SO = 2[(0 + \ 1/2) + (1/2 + \ 1/2) + (1/2 + \ 1/2 + \ 1/2) + (1/2 + \ 1/2 \ + 1/2 \ + 1/2)]$

$2SO \longleftrightarrow 10d$

First, the lengths will be introduced circular, compacted, Kaluza-Klein, in five dimensions.

$l_p(5) = 2.571800436$; $R_p(5) = \sqrt{2\pi}$

Ten being the terms of a complete operation supersymmetry, SO, equivalent to ten dimensions, in turn equivalent to twice the sum of all spins, and also equivalent to particle-antiparticle five pairs, of any spin, we have:

$$10 + R_p(5) \approxeq \sum_s (s+1)s = 25/2 \;\; ; \; 10 + R_p(5) = 12.50662828$$

Be the model of a particle in a potential of spherical symmetry. V(r) = 0, or solving the vacuum in the basis of spherical harmonics.

$$V_{eff}(r) = \frac{\hbar^2 s(s+1)}{2m_0 r^2} \to s(s+1) = \frac{(\triangle x \triangle p)^2}{\hbar^2} \;\; ; \; 5H\sum_s s(s+1) = 5H\left[\sum_{x_1,p_1}^{x_5,p_5} \frac{(\triangle x \triangle p)^2}{\hbar^2}\right] \;\; , \; 5H\sum_s s(s+1) = A$$

$$5H\left[\sum_{x_1,p_1}^{x_5,p_5} \frac{(\triangle x \triangle p)^2}{\hbar^2}\right] = B \;\; ; \; A/5H + \; (dA/A)\bigg/\left[(\textstyle\sum_s (s+1)s)\sin(2\pi/l_p(5))(\sqrt{2/l_p(5)})\right] = d(m(VH)/m_e \; = D)$$

$$A/5H \;\; + \int (dA/A)\bigg/\left[(\textstyle\sum_s (s+1)s)\sin(2\pi/l_p(5))(\sqrt{2/l_p(5)})\right] + C = \int_{m_e}^{m(VH)} dD/D$$

$$\sum s(s+1) + \quad \ln(5\sum s(s+1))\bigg/\left[(\textstyle\sum_s (s+1)s)\sin(2\pi/l_p(5))(\sqrt{2/l_p(5)})\right] \; + C = \ln(m(VH)/m_e)$$

$$\ln(5\sum s(s+1))\bigg/\left[(\textstyle\sum_s (s+1)s)\sin(2\pi/l_p(5))(\sqrt{2/l_p(5)})\right] = 0.5833595817 \; ; \; \sum s(s+1) + 0.5833595817 = 13.08335958$$

$$13.08335958 + C = \ln(m(VH)/m_e) \;\; ; \; \exp(13.08335958) \; + (8\pi^2/3)l_p^4(5)\sin(2\pi/2\pi) = 481842.3788$$

$$481842.3788 = \left[(1.166364 \cdot 10^{-5} GeV)^{-1/2}/\sqrt[4]{2}\right]\bigg/ 5.109989276 \cdot 10^{-4} GeV$$

Calculation of the mass of boson m_h by the method of the vacuum contribution to the scaling of the spins As in the case of calculating the value of the Higgs vacuum is used the same method, except that in this case, we must subtract the value of the sum of the module of the spins, the contribution of the other four remaining Higgs bosons.

$$5H\sum_s s(s+1) = A \; ; \; 5H\sum_s s(s+1) = 5H\left[\sum_{x_1,p_1}^{x_5,p_5} \frac{(\triangle x \triangle p)^2}{\hbar^2}\right]$$

$$d(m_h/m_e = E) = A/5H - \; (dA/A)\bigg/\left[4 \cdot \textstyle\sum (s+1)s\right]$$

$$A/5H \;\; - \int (dA/A)\bigg/\left[4 \cdot \textstyle\sum (s+1)s\right] + C = \int_{m_e}^{m_h} dE/E \quad ; \; (25/2) - \ln(5 \cdot (25/2))/[4 \cdot (25/2)] + C = \ln(m_h/m_e)$$

$$\ln(m_h/m_e) = 12.41729667 \;\; ; \; m_e(GeV) \cdot \exp(12.41729667) = (5.109989276 \cdot 10^{-4} GeV) \cdot 247037.8073 = 126.236 GeV$$

This result simply confirms that obtained in our previous work, using a string in dimension seven.

3 The Higgs vacuum as the manifestation of vibrations of strings in five dimensions torus

3.1 Calculating the value of the Higgs vacuum using the principle of equivalence and the toric strings in five dimensions

Be the string length for the smaller radius of a torus in five dimensions, $R_p(5)$

Previously showed the linking of this length with the spins, a complete operation of supersymmetry, and / or disintegration of the virtual vacuum of boson-paired Higss antiboson, 10

$10+R_p(5)\approxeq\sum_s(s+1)s=25/2$; $10+R_p(5)=12.50662828$ (17) ; $l_p(5)=2.571800436$

In the method used in the scaling of the spins, as the main contribution to the Higgs field, according to the principle of equivalence, there is necessarily the existence of five bosons as a contribution to this vacuum. It should be noted that these strings are five dimension, but that the volume of a torus 5d has four dimensions; therefore must apply the uncertainty extended to four dimensions, following the principle of equivalent mass space.

It is that applying the change of scale and taking into account the correspondence between the circular turns and the number of Higgs bosons / spins sum: $5\cdot R_p(5)/\sin^{1/4}(2\pi/2\pi)=dD/D$

$D=m(VH)/m_e$; $\int_{m_e}^{m(VH)}dD/D\ +C=5\cdot R_p(5)/\sin^{1/4}(2\pi/2\pi)$; $\arccos(\sqrt{R_p(7)/l_\gamma})/2=\theta_{13}$

$$[\exp(5\cdot R_p(5)/\sin^{1/4}(2\pi/2\pi))]\cos^2(\theta_{13}/8)\cdot(5.109989276\cdot10^{-4}GeV)=246.2210071\,GeV\ (15)$$

But the surprising thing is to check the empirical relationship of extraordinary beauty:

$$[\exp\exp(l_p(5))\ -\exp(2[l_p-2]l_p^2)\ -2]=481842.9363\ ;\ 481842.9363\cdot(5.109989276\cdot10^{-4}GeV)=246.2212237GeV$$

The model of a d dimensional string $\psi(d)=\left(\sqrt{2^d/\prod_d l_d}\right)\prod_d\sin(k_dd)$ Where our choice for $k_dd=2\pi/l_p(d)$, $n=1$ fundamental state; and 2 is the minimum value for the zero point wave lenght,

In this section we apply the probabilities and densities of strings in five dimensions, to obtain the above results, and then calculate the masses of other Higss bosons.

That the Higgs field potential is a function of a fourth power is fully explained by relying on a volume of a torus in five dimensions (volume of dimension 4)

The jump of minimum energy of the Higgs vacuum, from a symmetry-breaking jump it, which corresponds to the boson newly discovered, the lowest mass, has been shown to depend on the scaling of the sum of the modules of all possible spins and can not be spin greater than 2.

With the relation (15) has shown that the field of vibration Higss is a torus in a five-dimensional compaction, the volume of the associated torus is of dimension four.

Applying these facts, the minimum break the symmetry energy from the vacuum value of Higgs (246.221 GeV) to the first mass less massive, or boson m_h ; we have:

$$\ln(m(VH)/m_h)=5H\cdot\sum_s(s+1)s\cdot\left[\sin^2(2\pi/l_p(5))\cdot[2/l_p(5)]\right]^4=5\cdot(25/2)\cdot(0.3215831735)^4=0.6684259225$$

$$246.221202\,Gev/\exp(0.6684259225)=126.1919\,GeV$$

$$\ln(m(VH)/m_h)=5H\cdot\sum_s(s+1)s\cdot P^4(2,l_p(5))\ (16)$$

$$2\cdot5H\longleftrightarrow2\sum_s s\longleftrightarrow10d\ ;\ 10\cdot\sin^2(2\pi/l_p(5))\approxeq\ln[5H\cdot\sum_s s(s+1)]\approxeq4.135238729$$

Scaling law $m(VH)/m_h=\left[\exp(P(2,l_p(5))\ -1\right]^{-2}-5=1.950436012\rightarrow m_h\approxeq126.23\,GeV$

$$m(VH)/m_e=\exp\left[(\exp(\sin^2(2\pi/R_p(5))\cdot(2/R_p(5))-1)^{-1}+2\cdot5H\right]-\exp(5H)=\exp[(\exp(P(2,R_p(5))-1)^{-1}+10H]-\exp(5H)$$

$$\exp[(\exp(P(2,R_p(5))-1)^{-1}+10H]-\exp(5H)=481841.9599\rightarrow m(VH)\,GeV=246.2207\,GeV$$

$a)\ \ln(m(VH)/m_h) = \sum_s (s+1)s - [l_p(5) \cdot P(2, l_p(5)]/10 = (25/2) - [2.571800436 \cdot 0.3215831735]/10 = 12.41729523$

$b)\ 2 \cdot 5H + [2 - \tan(2\pi/dim[SO(6)])]^2 = \ln(m(VH)/m_h) = 12.41731384\ \ ; a), b) \to m_h = 126.23\ GeV$

Higgs boson mass calculation m_h **by two copies of SU (5)**$\to SU(7)$ $\quad (dim[SU(7)] \cdot \left\{\sin^2[2\pi/R_p(5)](2/R_p(5)\right\}^5)^{-1} - 2 \cdot 5H = [dim[SU(7)] \cdot \left\{P(2, R_p(5))\right\}^5]^{-1} - 2 \cdot 5H = 1.95147829$;

$1.95147829 \approxeq [\sin^2(2\pi/l_p(7))(2/l_p(7)]^{-1} = 1.951381365 \approxeq m(VH)/m_e$

4 The angle β used in the supersymmetry

This angle is essential for calculating the mass of the Higgs boson m_h , among other things.

Show, because we think that this angle should be, practically equal to: $(\pi/2\ - 2\pi/60)$

One of the main reasons, among several, is that this angle meets a very special requirements, from a standpoint of the groups SU (n) and SO (n), and deep relationship with the amount of particles from the vacuum and standard model.

$(\pi/2\ - 2\pi/60) = \beta\ ;\ 60 = SO(6) \cdot SO(4) = \sum_{d/24} d\ ;\ 4! = 6 \cdot 4 \to SU(5)\ ;\ 6d + 4d = 10d$

$2 \cdot SO(5) \cdot SO(4) = SO(16)$

Packing density of spheres in five dimensions: $\rho(5d) = \pi^2\sqrt{2}/30\ ;\ 2\pi/\sqrt{\rho(5d)} = \beta$

The spins can be obtained with these empirical relations sufficiently precise and highly significant: $R_p(7) = 2.95694905822$

$1/[\exp(R_p(7))] \sin\beta \cos\beta] = 0.4999935 \approxeq 1/2\ ;\ \beta = 84^\circ$

$[\exp(R_p(7))] \sin\beta \cos\beta] - [\exp(R_p(7))] \sin\beta \cos\beta]^{-1} = 1.50003211 \approxeq 3/2$

$2P(R_p(7)) = 2 \cdot \sin^2(2\pi/R_p(7))(2/R_p(7)) = 0.9782299848 \approxeq \sin^2\beta = 0.9782669826$

1. $dim[SU(6)] + dim[SU(4)] = 2\sum_s s(s+1)\ ;\ dim[SU(4)] = \sum_s 2s + 1$
2. $(2^{1/8})^{26} = 9.513656996 \approxeq \tan\beta$
3. $\sin(2\pi/dim[SO(6)]) + \sin(2\pi/dim[SO(10)]) = \sin\beta$
4. $\exp(\sqrt{\tan\beta} + 10) + \exp(6) - (\sin(2\pi/2\pi) + \cos(2\pi/2\pi) - 1)/\sqrt{2} = m(VH)/m_e$
5. $(l_p(5)/5) + 3^2 = \tan\beta = 9.514360087 \to 83.9999972^\circ \to (90^\circ - 6^\circ) \to (\pi/2\ - 2\pi/60)$
6. $[(\tan\beta/10) + 1]\cos^2(\theta_{13}/8) \approxeq m(VH)/m_h = 246.221202\ GeV/126.23\ GeV$
7. $[(\tan^4\beta/10^4) + dim[SO(7)]\ ]/dim[SO(6)] \approxeq \Omega_b^{-1}/15$
8. $\Omega_b^{-1}/15 \approxeq \int[\cos(2\pi/x) + \sin(2\pi/x)] \cdot [\cos(2\pi/x) - \sin(2\pi/x)]dx\ ;\ x = 2\pi$
9. $\beta \approxeq \theta_w + \theta_w(GUT) + \theta_c + (\pi/2\ - \beta) - \delta_{CP}\ ;\ \beta \approxeq 2\theta_w(GUT) + \theta_{13} - \delta_{CP}\ ;\ \delta_{CP} = \theta_{13}/\pi^2$
10. $(\tan\beta + 20)^{-1} = \alpha_2 = \alpha_{EM}/\sin^2\theta_w$

11. $\cos\beta = \sin^2\theta_{13}(neutrino\, mixing\,) = (l_\gamma - R_p(7))/l_\gamma\ ;\ l_\gamma = \sqrt{\alpha^{-1}/4\pi}\ ;\ R_p(7) = 2.9569490582$

12. $\sin^{88}\beta = \pi^2/16 = \rho(4d)$ $(\, packing\ density\ of\ spheres\ in\ four\ dimensions\,)$ $89 \cdot 23 = 2^{11} - 1$

$120 - 8 = 89 + 23 = 112 = 4dim[SO(8)]$

$(\exp\sqrt{88 \cdot 2})/([(l_p(7) + R_p(7))/2] - 2) = m(VH)\sqrt[4]{2}/m_e$

5 Scale of supersymmetry

As mentioned earlier in this work, the principle of equivalence implies that

distinction between spatial dimension, temporal dimension or mass, is purely due to the breaking of symmetries, scaling observation and geometric-topological changes associated with this. Vacuum virtual particles, which is that of which we are concerned, since they can not be observed, so are virtual, must obey the principle of equivalence as symmetrized spin concepts, dimensions, number of particles, groups. In other words, what the observer perceives as interference by the observable, is a partial vision of a physical entity, which itself is a unitary system, interconnected and intertwined. I really think it is pure geometry, topology, and changes in a well-defined metric.

The distinction between spins, electric charges, etc, is a partial perception of a unitary physical entity. It is the observer can not, simultaneously, measure all the observables as a whole, and therefore does not perceive the unit correlations.

5.1 Spins, electric charges and symmetry

With the principle of equivalence, we obtained eight states of mass commutation. It has been seen as the uncertainty associated with the dimension of these eight statea has appeared in some relationships built before. The number 32, the supercharges, which implies the existence of eleven dimensions, $32 = 2^{(11d-1d)/2} = 2^5$, could be interpreted in an equivalent manner as all possible polarizations of the photon in five dimensions, and equally as all possible sets

five spines. But this goes beyond equivalence. All electrical loads seem possible

can be expressed as a function of spin and four states that could correspond either to the four basic states of mass switching to a dimension, canonical switching operator, or four dimensions. This number increases by one unit to take into account the electric charge 1/3 of bosons Y.

The scheme of generation of electric charges would be as follows, with the effect of compactification (negative or positive curvature):

$\left\{q = \frac{(i^2)^{2s}2s}{3}\right\} = \left\{\frac{-1}{3}\ ,\ \frac{2}{3}\ ,\ -\frac{3}{3}\ ,\ \frac{4}{3}\right\}$ The electric charge 1/3, corresponding to the boson Y, must be

expressible as $\frac{1^{2s}}{3}$, $s = 0$ Only if this set of charges, incorporating the octonions, we obtain 32 states: $2^3 = 8$, $\sum_{e_n=0}^{7}\left\{q = \frac{(e_n^2)^{2s}2s}{3},\ \frac{1^{2s}}{3}\right\} \rightarrow \{32q\}$

Incorporating anti-matter: $\sum_{e_n=0}^{7}\left\{q = \frac{-(e_n^2)^{2s}2s}{3},\ \frac{1^{2s}}{3}\right\} \rightarrow \{-32q\}$

Thus, 64 states are obtained, which is the integer portion of: $\sqrt{\hbar}/e_{\pm}$

Similarly, the spins except the spin 0, are equivalent to sums of consecutive inverse minimum length, derived from the zero point energy 2 ; ending with a maximum in the spin 2, graviton. That is: $s = 2 \longleftrightarrow min\, l = 2l_p/l_p$ This equivalence, for the spin 1/2, would be exactly equal to the ratio of the Planck mass and Planck mass zero point: $1/2 \longleftrightarrow m_p(0)/m_p = 1/2$

Un boson de spin 0, que se transforma desde su spin, recorriendo todos los spines, hasta alcanzar el maximo spin posible, 2 (graviton) , requiere un conjunto de diez operadores de spin 1/2

$s = 0\,;\; 0 + 1/2 = 1/2\,;\; 1/2 + 1/2 = 1\,;\; 1(1/2 + 1/2) + 1/2 = 3/2\,;\; 3/2(1/2 + 1/2 + 1/2) + 1/2 = 2$

So we have an equivalence between the 32 possible sets of spins, and the set of 32 electric charges, if incorporated eight dimensions, equivalent to the mass-space extension of the uncertainty principle to the extra dimensions. The scheme would correspond to: 4.4,2,1

The integer part of scaling the mass of the electron pair antielectron respect to the Planck mass: $\lfloor 2 \cdot \ln(m_p/m_e) \rfloor = \sum_{F_n/240} F_n^2 = 103$ Recalling that : $\lfloor 2 \cdot \ln(m_p/m_e) \rfloor + \lfloor \alpha^{-1} \rfloor = 240$

As the electron a fundamental state of the mass, the decomposition of the vacuum by the maximum amount of particle-antiparticles, as was shown in our previous work, which represents the ratio? $\sqrt{103/10}$; or the approximate equivalent $32/10$

103 being the sum of spherical coordinates, due to the Fibonacci numbers, divisors of 240, and being 10, the maximum spin operators 1/2 that should go a spin zero boson (bosons Higss) to become a particle in this case, a graviton, the ratio $\sqrt{103/10}$, suggests that should be the minimum ratio involved in the renormalization of the mass of the Higgs boson, m_h , the effect of the logarithmic term between the stop and the top quark.

The ratio $32/10 \approxeq \sqrt{103/10}$, is precisely the maximum overall density of spins, for the most of spin operators to transform a Higgs boson, sfermion of spin zero in a graviton. Since the Higgs boson and the graviton are directly related to the mass, leads us to believe that $\sqrt{32/10} \approxeq \sqrt[4]{103/10} \approxeq \ln(m_{\tilde{t}}^2/m_t^2)$

In fact, as we show below, the ratio of the squares of the masses of the stop and the top quark would be very close to the module of the graviton, $s = 2 \rightarrow s(s+1) \approxeq (m_{\tilde{t}}^2/m_t^2)$ It is logically so, under a supersymmetry full operation from a spin 0 boson to a graviton, which requires 10 jumps of spin 1/2

The dimension four for the mass and space, for the breaking of symmetry of the eleven dimensions, holography would correspond to a five-dimensional torus, which is four-dimensional volume. Thus was obtained the scheme 5, 5, 1.1

The equivalence extends to the number of switching states mass-space to four dimensions: $8 \cdot n_+(4) = 32$

In a state of highest symmetry, the mass-space becomes ten dimensions.

Recent experimental results on the disintegration of the Higss boson m_h in difoton channel indicate that the MSSM model should be discarded in favor of the NMSSM model or some flavor of it. These models support the discrepancy of the muon anomalous magnetic moment, compared to experimental results confronted with the theoretical estimate, among other problems.

Given these models, the number of particles to the scale of supersymmetry, would be 58, with the two bosons H that adds the NMSSM model. This amount is exactly equal to: $26 + 32$

The amount of squarks-antisquarks dimension is twenty-four and twenty-six, adding a gluino pair-antigluino. We think that the stop mass can be calculated with approximation, by the probability of a string in dimension 26, representative of anti-squak virtual pairs, and gluino-antigluino.

This idea we sustain in the fact that the value of the Higgs vacuum, $m(VH)$ can be expressed as a volume 10d, as a double copy of 5d, with a radius of compactification mass $R_p(5)$; being the volume of eleven-dimensional torus. Likewise, the mass of the electron, can be expressed as the volume of a torus of 26 dimensions with a compactification radius of the mass dimension $R_p(26)$ Volume as a ratio between the Planck mass and the mass of the electron.

In these relations are extended to uncertainties extra dimensions, which have been previously shown. These volumes are referred to the scale of the mass of the electron, as ratios between the Planck mass and the mass of the electron to the volume of twenty-six dimensions, and the ratio of value, mass of the Higgs vacuum and the mass of the electron for two copies of dimension five, ten. The two relations have been obtained from semi-empirical way, but the exact equivalence and similarity of the two, leave no doubt about its physical sense.

The smaller radii of a torus of eleven and twenty-six dimensions appear to be the following relationships:

$R_p(11) = 3.821172533\ ;\ R_p(26) = 6.439897304$

$[R_p(11)/\sin(2\pi/R_p(5))][m(VH)/m_h\ -1]^{1/(\frac{11\cdot 26}{2})} = 6.439893303$

$(11\cdot 26)/2 = dim[SU(12)]$

Higgs vacuum value as a function of the volume of a torus in 11 dimensions

a) $l_p(5) = 2.571800436\ ;\ R_p(5) = \sqrt{2\pi} = m_p^{-1}(5)\ ;\ min(\triangle^8 x) = 1/2^{1/8}\ ;\ Volume\,Torus\,11d = (64\pi^5 r^{10}/945)$

$m(VH)/m_e \approxeq [(R_p(5)\cdot min^{-1}(\triangle^8 x))^{10}\cdot(R_p^{-1}(5)l_p(5))^{1/16}\cdot 64\pi^5]/945 = 483482.8500432174$

$\left\{[(R_p(5)\cdot min^{-1}(\triangle^8 x))^{10}\cdot(R_p^{-1}(5)l_p(5))^{1/16}\cdot 64\pi^5]/945\right\} - [(\pi^4-1)l_p^3(5) + (10\cdot\sin 2\theta_{13})^{-4}] = 481842.894$

$481842.894 \to 246.221202\ GeV$

b) $R_p(11) = 3.821172533\ ;\ l_p(11) = 3.9562145665$

$\left\{[(R_p(11)\cdot min^{-1}(\triangle^8 x))^{10}\cdot(R_p^{-1}(11)l_p(11))^{1/16}\cdot 64\pi^5]/945\right\}\Big/[15(\sin 1\cos 1+1)-21]^{-1}\cdot(dim[SO(11)]+\frac{2}{l_p(5)})] =$
$m(VH)/m_e\quad ;\ (2/l_p(5))\cos(\theta_{13}/4) = \cos^2\theta_w = m_W^2/m_Z^2 = 0.777006621\ ;\ \theta_{13} = 9.433531269°$

$8\cdot\cos(2\pi/5) - 2 = \sin\theta_W\ ;\ 8\cdot\sin(2\pi/5)/2 = \lambda(h)\ ;\ m_h^2 = \lambda(h)m^2(VH) \to m_h(GeV) = 246.221202/\sqrt{\lambda(h)}$

Higgs vacuum value as a function of the volume of a torus in 7 dimensions $m(VH)/m_e = \Big\{[(R_p(7)\cdot min^{-1}(\triangle^8 x))^6\cdot (R_p^{-1}(7)l_p(7))^{1/16}\cdot 16\pi^3]/15\Big\}\cdot\Big(\exp[P(2,R_p(5)]\cdot R_p(7)\cdot l_\gamma\Big)$

Value of the mass of the electron as a function of the volume of a torus in 26 dimensions $l_p(26) = 6.612405391\ ;\ R_p(26) = 6.439897304 = m_p^{-1}(26)\ ;\ V_T(26d) = \pi^{13}r^{25}/239500800$

$l_p(26) \approxeq l_p^2(5)\ ;\ R_p(26) \approxeq l_p(5)R_p(5)$

$m_p\Big/(\alpha^{-1}\pi^2\ +[\psi^{-1}(2,l_p(26)]/10)\cdot\Big\{(R_p(26)min^{-1}(\triangle^8 x))^{25}\cdot V_T(26d)\cdot(l_p(26)/R_p(26))^{1/16}\Big\} = 9.10938039861\cdot 10^{-31}$

The relationships between the dimensions 5, 7, 11 and 26 $R_p(11)+l_p(11) = 7.7772970995$

$[R(11)+l_p(11)]\sin(2\pi/R_p(26))]/\cos^4(\theta_{13}/v(H))$

$v(H) = [\sin(2\pi/2\pi)+\cos(2\pi/2\pi)]^4/8\quad +\Big\{[\sin(2\pi/2\pi)+\cos(2\pi/2\pi)]^2/2\Big\}+6$

$l_p(7)[15(\sin 1\cos 1+1)\ -21] = 2.506655291 \approxeq \sqrt{2\pi} = R_p(5)\ ;\ 1 = 2\pi/2\pi$

5.2 The relationship between trigonometric expressions of the equivalence principle, the potential field Higss and mass of the boson m_h

When we consider the Higgs field "Mexican hat" potential energy:

$V = \frac{\lambda}{8}|h|^4 - \frac{m^2}{2}|h|^2$; empirically, we see this exact equivalence: $h = \sin(2\pi/2\pi) + \cos(2\pi/2\pi)$; $m^2 = (\frac{xp-px}{\hbar})^2$; $\lambda = 1$; replacing and adding the term $\cos(2\pi/2\pi)$;we have: $[\sin(2\pi/2\pi)+\cos(2\pi/2\pi)]^4/8 \quad +\Big\{[\sin(2\pi/2\pi)+\cos(2\pi/2\pi)]^2/2\Big\}(\frac{xp-px}{\hbar})^2 \quad +$ $\cos(2\pi/2\pi) = 1.950628$ =246.221202 $GeV/126.2266\,GeV$; $126.2266\,GeV = m_h$

5.2.1 Scale of supersymmetry

Are the four observable dimensions of uncertainty, such that: $s =\ spin$; $s \neq 0$; $\Big\{\Delta x_1, \Delta x_2, \triangle x_3, \triangle x_4\Big\} =$

$$= \sum_{n=1,s}^{4} \Big\{(i^2)^{2s}/2^{1/8}\Big\} = \Big\{-1/2^{1/8}, +1/2^{1/8}, -1/2^{1/8}, +1/2^{1/8}\Big\}$$

$\Delta x_1 \equiv \triangle x$; $\Delta x_2 \equiv \triangle m$; $\triangle x_3 \equiv \triangle x(c)$; $\triangle x_4 \equiv \Delta t(c)$

These four dimensions of uncertainty, according to relations (13) and (14), satisfies:

18) $(\Delta x_1 \triangle x_2 \triangle x_3 \triangle x_4)^2 = min(\,\Delta x \triangle p/\hbar) = 1/2$ 2) $\Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4 = 0$

Obtaining the spins: the principle of equivalence $a) \Big\{s\Big\} = \Big\{\Delta^8 x_1,\ \Delta^8 x_2 + \Delta^8 x_1,\ \Delta^8 x_2 + \Delta^8 x_1 + \triangle^8 x_3,\ \Delta^8 x_2 + \Delta^8 x_1 + \triangle^8 x_3 + \triangle^8 x_4\Big\}$

The spin zero is equivalent to: 1) $s = 0 \equiv \Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4$ 2) $s = 0 \equiv \Delta^8 x_a - \Delta^8 x_b$; $(a, b) \leqq 4$

(19) $b)$ $(\Delta x_1 \triangle x_2 \triangle x_3 \triangle x_4)^2 \equiv s = 1/2$; $2(\Delta x_1 \triangle x_2 \triangle x_3 \triangle x_4)^2 \equiv s = 1$, $3(\Delta x_1 \triangle x_2 \triangle x_3 \triangle x_4)^2 \equiv s = 3/2$

$4(\Delta x_1 \triangle x_2 \triangle x_3 \triangle x_4)^2 \equiv s = 2$; $\Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4 \equiv s = 0$

Obtaining all the spins except spin zero, needs ten terms, equivalent to

transform a boson with spin 0 in a graviton, through all possible transformations

spin. In conclusion: We performed a complete operation supersymmetry.

The 32 possible sets of spins are obtained with the introduction of the octonions. Thus, it has now including zero spin:

(20) $\displaystyle\sum_{e_o}^{e_7} \sum_{n=1,s}^{4} \Big\{(e_n^2)^{2s}/2^{1/8}\Big\} - {}_{s=0}\Big\{(e_n)^{2s}/2^{1/8}\Big\} \equiv \Big\{32\Big\}$ (All possible sets of spins)

Precisely the cardinal of the set : $card\left\{\displaystyle\sum_{e_0}^{e_7} \sum_{n=1,s}^{4} \Big\{(e_n^2)^{2s}/2^{1/8}\Big\}\right\} \equiv K(5d)$ (Kissing number for five dimensions)

As for the spin zero, it holds that: $(e_n)^{2s}/2^{1/8} = 1/2^{1/8}$;then holds:

$\displaystyle\sum_{e_o,s=0}^{e_7} (\Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4) = 8/2^{1/8}$ Undoubtedly, the latter result implies the existence of seven Higgs bosons (torus dimension d = 8 - 1), and explains why the result is correct for the mass of m_h ; as a function of a string in seven dimensions of the field holography 8d, or compactification on a torus with volume seven dimensions $SU(7) \to 2 \cdot SU(5)$

With the above relation is obtained Higgs vacuum value.

$8/2^{1/8} \equiv 8 \cdot min(\triangle^8 x)$ It is the uncertainty value of the sum of spherical coordinates of a sphere of eight dimensions of unit radius l_p/l_p And the difference $\sqrt{8/2^{1/8}} - l_p/l_p = \sqrt{8/2^{1/8}} - 1 = \triangle r$ is a minimum. If the change is made to comply with the minimum value of uncertainty: $(\frac{1}{2}\triangle r)$ Applying mass-space duality, ie $(\frac{1}{2}\triangle r)^{-1} = \frac{1}{2}\triangle m$; immediately obtain the value of the Higgs vacuum, using the scaling law:

$$\ln(m(VH)/m_e) = \sum_s s(s+1) + \left(\int \frac{dx}{2\sqrt{x}}\right)^{-1} + C \ ; \ x = \sqrt{8/2^{1/8}} - 1$$

$$m(VH)/m_e = \exp\left[\sum_s s(s+1) + \ 1/\left(\sqrt{8/2^{1/8}} - 1\right)\right] + 2^5 + 1$$

Equivalences $\quad 32 \equiv 4^2 + 4^2 \equiv two\ matrices\ , the\ operators\ of\ mass\ commutation$

$s = 2$; $32 \equiv s \cdot 4^2$; $\equiv (3/2\ +\ 1/2)4^2 \equiv \sum_{x_1}^{x_8} (x_n = 2)^2$ (Sum spherical coordinates of the minimum length, a value of zero point vacuum)

The value of the integer part, obtained by the decomposition of the vacuum, the term logarithmic scaling of the electron, relative to the Planck mass $103 = \left\lfloor 2 \cdot \ln(m_p/m_e) \right\rfloor \equiv$ a virtual electron-anti-electron pair

$$\left\lfloor 2 \cdot \ln(m_p/m_e) \right\rfloor + \left\lfloor \alpha^{-1} \right\rfloor = 240 \equiv 2 \cdot SU(11)$$

$$103 = \left\lfloor 2 \cdot \ln(m_p/m_e) \right\rfloor = 3^4 + 2^4 + 1^4 + 1^4 + 1^4 + 1^4 + 1^4 + 1^4 \equiv$$

$$\equiv (2 \cdot \tfrac{3}{2})^4 + (2 \cdot 1)^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4$$

$$+(2 \cdot \tfrac{1}{2})^4 \equiv (2(2 - \tfrac{1}{2}))^4 + 2(\tfrac{3}{2} + \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4 + (2 \cdot \tfrac{1}{2})^4$$

The above equivalences, which are the 32 possible sets of spins, and ten being the terms of spin $1/2$, to transform, in a continuous operation, a spin zero boson and / or sfermion spin zero, a graviton, we suggests that the scale of supersymmetry, for the logarithmic term of correction of the mass of the boson m_h , in the ratio of the NMSSM models, is a value dependent on the law of change of scale, very close to $\sqrt{32/10} \approxeq \sqrt[4]{103/10}$

Surprisingly, it has this very approximate relationship:

$$\exp[\psi^{-1}(2, l_p(5)]/\sqrt{\sin(2\pi/l_\gamma)}] = \exp(\sqrt[4]{103/10}) \approxeq \exp\left[\sqrt{\sinh(2^{-1/8}) + \cosh^2(2^{-1/8})}\right]$$

$$\psi^{-1}(2, l_p(5) = \left[\sin(2\pi/l_p(5))\sqrt{2/l_p(5)}\right]^{-1} = 1.763410172 \ ; \ \exp[\psi^{-1}(2, l_p(5)] = 5.83229264281383$$

$$\sqrt{\sin(2\pi/l_\gamma)} = \sqrt{\sin(2\pi/\sqrt{\alpha^{-1}/4\pi})} = 0.97233113208923 \ ; \ \exp[\psi^{-1}(2, l_p(5)]/\sqrt{\sin(2\pi/l_\gamma)}] = 5.99825764118248$$

$$\exp(\sqrt[4]{103/10}) = 5.99825765404572 \ ; \ \exp\left[\sqrt{\sinh^2(2^{-1/8}) + \cosh^2(2^{-1/8})}\right] = 5.99823425291042$$

5.2.2 The mass of the stop

The coordinate system of uncertainty $\Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4 \equiv s = 0$, is that necessarily must allow the collection of the mass of the stop, since it is a leap into the supersymmetry, and describes the value of spin zero field virtual vacuum Higss. The supersymmetry and the coordinates of uncertainty, relations (18) and (19) generating the spins and electric charges (just enter the terms 2s and 3) are therefore completely correlated.

These coordinates, we assume, must comply with special relativity. It must consider two coordinates: one with positive imaginary time, and one with a negative imaginary time, because: $x_1^2 + x_2^2 + x_3^2 + (cti)^2 = 0 \equiv \Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4$; $x_1^2 + x_2^2 + x_3^2 + (ct - i)^2 = 0 \equiv \Delta x_1 + \triangle x_2 + \triangle x_3 + \triangle x_4$

Having a unit length given by l_p/l_p , and taking into account an imaginary time positive and negative, have the following coordinates relativistic:

$$min(\triangle^8 x, m) = 2^{-1/8} \ \ , cti = i(l_p/l_p), \ x = \cosh[min(\triangle^8 x, m)] + i\sinh[min(\triangle^8 x, m)] \ \ (21)$$

$$y = \cosh[min(\triangle^8 x, m)] - i\sinh[min(\triangle^8 x, m)]$$

These two relativistic coordinates are equivalent to a change of scale of the instability of the vacuum, the spin zero. This change of scale, introducing a positive and negative fluctuation (vice versa), the minimum value of uncertainty, $min(\triangle^8 x, m)$; for mass coordinates and time, respectively, for example. That is:

$$d\triangle y_1 = \frac{1}{2}\frac{d\triangle x_1}{\triangle x_1} - \frac{1}{2}\frac{d\triangle x_2}{\triangle x_2} + \frac{1}{2}\frac{d\triangle x_3}{\triangle x_3} + \frac{1}{2}\frac{d\triangle x_4}{\triangle x_4} \ ; \ d\triangle y_2 = \frac{1}{2}\frac{d\triangle x_1}{\triangle x_1} + \frac{1}{2}\frac{d\triangle x_2}{\triangle x_2} + \frac{1}{2}\frac{d\triangle x_3}{\triangle x_3} - \frac{1}{2}\frac{d\triangle x_4}{\triangle x_4} \ ; \ d\triangle y_1 \equiv d\triangle y_2$$

$$\int d\triangle y_1 = \frac{1}{2}\int\left(\frac{d\triangle x_1}{\triangle x_1} - \frac{d\triangle x_2}{\triangle x_2} + \frac{d\triangle x_3}{\triangle x_3} + \frac{d\triangle x_4}{\triangle x_4}\right) \ ; \ \exp(\triangle y_1) = \cosh(2^{-1/8}) + \sin h(2^{-1/8})$$

$$\sinh(2^{-1/8}) = x_5 \ ; \ \cosh(2^{-1/8}) = x_6$$

$$x_6^2 + x_5^2 = \Big(\cosh[min(\triangle^8 x, m)] + i\sinh[min(\triangle^8 x, m)]\Big)\Big(\cosh[min(\triangle^8 x, m)] - i\sinh[min(\triangle^8 x, m)]\Big)$$

$$x_6^2 + x_5^2 = \cosh^2(2^{-1/8}) + \sinh^2(2^{-1/8})$$

Applying the scaling law:

$$\exp(\sqrt{x_6^2 + x_5^2}) = \ln(m_{\tilde{t}}^2/m_t^2) \ (22) \qquad , \ \ln(m_{\tilde{t}}^2/m_t^2) \simeq (2\ln(m_p/m_e)\sqrt[4]{2})\alpha = 2\sin(\arctan 2) \ \ ;$$

$$\ln(m_{\tilde{t}}^2/m_t^2) \approxeq \exp[\cos(2\pi/2\pi)]$$

5.2.3 Calculation of the mass of the stop using the string model

In the virtual vacuum, the Higgs field, we can admit the appearance equiprobable of pairs-antisquarks squarks, plus a pair gluino-antigluino. The amount, in this mode of variation of the symmetry of the vacuum, peer, it would be of dimension twenty-six. Accepting that the mass is a compactification dimension with a torus radius, then the dimension of the probability of the oscillation of the string must be of dimension twenty-five. And the derivative of this oscillation probability would give us the mass of the stop, as a minimum energy of this state of the vacuum.

$$R_p(26) = 6.439897304 \ ; \ l_p(26) = 6.612405391 \ ; \ D[P^{25}(2, R_p(26)] = D(X^{25} = P^{25}(2, R_p(26)) = 24 \cdot P^{24}(2, R_p(26))$$

$$m_{\tilde{t}} = \frac{1}{2}m_p \cdot \Big\{\sin^2(2\pi/R_p(26)) \cdot (2/R_p(26))\Big\}^{24} \ \ (23)$$

Since they are particle-antiparticle pairs, and there are twenty-four pairs squark-antisquark, then the mass of the stop would be:

$$[m_p \cdot P^{24}(2, R_p(26))]/2 = \frac{1}{2}m_p \cdot \Big\{\sin^2(2\pi/R_p(26)) \cdot (2/R_p(26))\Big\}^{24} = \frac{1}{2} \cdot 2.176437508 \cdot 10^{-8} Kg \cdot \Big\{\sin^2(2\pi/R_p(26)) \cdot (2/R_p(26))\Big\}^{24} =$$
$$\frac{1}{2} \cdot 2.176437508 \cdot 10^{-8} Kg \cdot (7.5678584558066 \cdot 10^{-17}) = 8.23548549922 \cdot 10^{-25} Kg$$

Now it seems that it is necessary to introduce a small term of correction by $\cos(2\beta)$ This correction would be due to the relation (23) is expressible as a function of the angle of the cone, the spin two, the graviton, and the value of the Higgs vacuum.

$$(24) \ \left[\left(\sqrt{2/2(2+1)}\right) \cdot (m(VH)/m_e)\right]^{1/24} \cdot m(VH) \approxeq \frac{1}{2}m_p \cdot \Big\{\sin^2(2\pi/R_p(26)) \cdot (2/R_p(26))\Big\}^{24} \cdot \cos^4(2\beta) \ , \ 2\beta = 28\pi/30$$

$$28 = dim[SO(8)] \ \ ; \ 30 + 28 = 58 \ \ ; \ 8 \cdot 7 = n_+(7) = \sum_{d=2}^{7} SO(d) = 2dim[SO(7)] = 56 \rightarrow \{n_+(3)\} \cup \{n_+(4)\} = \{n_+(7)\}$$

56 + 2H (model NMSSM) = 58

We have two alternative outcomes for the mass of stop: 1) $\exp(\sqrt{x_6^2+x_5^2}) = \ln(m_{\tilde{t}}^2/m_t^2)$

$\ln(m_{\tilde{t}}^2/m_t^2) = \exp\left[\sqrt{\sinh(2^{-1/8})+\cosh^2(2^{-1/8})}\right] = 5.998234248 \to m_{\tilde{t}} = \sqrt{(172.7\ GeV)^2\cdot 5.998234248} = 422.9646272\ GeV$

2) $\ln\left(\left[\frac{1}{2}m_p\cdot\left\{\sin^2(2\pi/R_p(26))\cdot(2/R_p(26))\right\}^{24}\cdot\cos^4(2\beta)\right]^2\Big/m_t^2\right)\to m_{\tilde{t}} = 422.90009\ GeV$

Results 1) and 2), appear matched by: $(422.9646272\ GeV)\cdot\sin(2\pi/l_p(11)) = 422.90044\ GeV$

Our choice will be the result obtained by the method of the strings.

5.2.4 The adequacy of the choice of lengths of strings, $R_p(26)$; $l_p(26)$, and its close relationship to the Higgs vacuum

The value of the Higgs vacuum, one can obtain a very clear by the lengths on twenty-six dimensions, and a term of correction of the contribution of the spins by the greater length of the torus in five dimensions.

$\ln(m(VH))/m_e = l_p(26)+R_p(26)+[\sin(2\pi/l_p(5)]/\sum_s s(s+1)] - 2\ln(l_p(4))$; $l_p(4) = 2.324894703$

$2\ln(l_p(4)) \approxeq [\sin(2\pi/2\pi)\cos(2\pi/2\pi)+1]^{-1}+1$

5.2.5 Checking the value of the stop mass to calculate the mass of the boson m_h with the angle $\beta = 28\pi/60 \equiv 84^\circ$ and the generic model NMSSM.

$\sin^{88}\beta \approxeq \pi^2/16 = \rho(4d)$; $\beta = 28\pi/60$; $60+28 = 11\cdot 8 = n_+(11)$; $(\pi/2)-(2\pi/60) = \beta$

$28 = dim[SO(8)]$; $60 = dim[SO(5)]\cdot dim[SO(4)]$; $dim[SO(8)]+dim[SO(5)]+dim[SO(4)] = n_+(11)/2$

$n_+(11)/2 = 44 = 3c\cdot 12\ squarks + 8\ gluinos$; $44\cdot\sin(2\pi/R_p(5)) = 26.098$ (6 quarks·3c + 8 gluons)

$dim[SO(8)]\cdot dim[SO(5)]\cdot dim[SO(4)] = 2dim[SO(41)]$, $K(5D) = 40$ (Kissing number 5D)

$60\cdot\rho(5d) = 60(\pi^2\sqrt{2}/30)$ $60\cdot\rho(5d)+\ln(m(VH)/m_e)-26/2 = 28.0008301$

$\left\{\cos(2\pi/[\exp(2\cdot 28/10)])\cdot(\pi^2/16)\right\}^{1/88} = \sin\beta$

$V_T(7d) = (16\pi^3)/15$; $[V_T(7d)\cdot l_p^6(7)\cdot\sinh^6(R_p(7)/l_p(7))\sin\beta\tan\beta]/\cos(2\pi/15)\cos(2\pi/45) = (m(VH)\sqrt[4]{2})/m_e$

$15+45 = 60 \longleftrightarrow SO(6)+SO(10)$; $60 = 6\cdot 10$

The generic relationship model NMSSM, for the mass of boson m_h $m_h^2 \simeq m_Z^2\cos^2 2\beta+\lambda^2v^2\sin^2 2\beta-\frac{\lambda^2}{k^2}v^2(\lambda-k\sin 2\beta)^2+(3m_t^4/4\pi^2v^2)[\ln(m_{\tilde{t}}^2/m_t^2)+\frac{A_t^2}{m_{\tilde{t}}^2}(1-\frac{A_t^2}{12m_{\tilde{t}}^2})]$ (25)

A theory with random parameters, is an incomplete theory. Undoubtedly, these parameters should be constant, deductibles accurately in a more general theory.

For the parameter λ, we have chosen a value that is twice the "constant" electroweak coupling, $\approxeq (29.568/2)^{-1} \approxeq (20+\tan\beta)^{-1}$ The reason for this choice will be seen below, when you deduct the value of the boson A_0

Automaticamente, al hallar el valor de λ ,gets the value of k , using the relation (25)

This value appears to be very close, if not equal to: $[10\sin^2(2\pi/l_p(5))(2/l_p(5))]^{-2} = k$

$246.2212\ GeV \cdot \exp((29.568/2)^{-1}) \simeq 1324\ GeV = m_t/[4 \cdot P^2(2, l_p(5)) \cdot 4 \cdot P^2(2, R_p(5))] = A_t$

The result obtained by the relation (25), with a mass of 422.9 GeV stop and angle $\beta = 84°$, $A_t = 1324\ Gev\ or,\ 626\ Gev$, is:

$$m_h^2 \simeq 91.1876^2 \cdot \cos^2 168° + \lambda^2 174^2 \sin^2 168° - \frac{\lambda^2}{k^2} 174^2 (\lambda - k \sin 168°)^2 + [3 \cdot 172.7^4/(4\pi^2 174^2] \cdot ....$$
$$\cdot [\ln(422.9^2/172,7^2) + \frac{1324^2}{422.9^2}\left(1 - \frac{1324^2}{12 \cdot 422.9^2}\right)] = (126.2)^2 GeV$$

6 On semiempirical relationships based on toric strings in five dimensions. Possible masses of some bosons Higss

In this last section we present a set of relationships, which by its symmetry, the possibility to calculate the mass of boson newfound m_h , and its basis in the principle of equivalence leads us to believe that any of the calculated masses are in agreement with reality. Especially the boson masses m_{A^0} , m_{a_1} , m_H , $and\ m_{H^\pm}$

With the principle of equivalence we stated that the physical reality, when it is not observed, is not interfered with by fthe measure, especially, speak of the virtual vacuum, the difference between dimensions, spins, number of particles as the inverse of probability, the reverse of this, as ratio between mass / particle lengths. not exist. The space-time-mass would be more geometric and symmetrical than we think. The density of packing of spheres in d dimensions plays an important role. The space-time would not be as random as we suspect, on the contrary: The unitarity property is ensured by maximum packing hyperspheres that have connectivity to a central, at a time. This connectivity, these tangential points of contact would be equivalent to the nodes-vertices of Feynman diagrams. The different paths of the vibrations of these hyperspheres or hyper torus would be all possible paths by receiving the contact points of these hyper torus. As far as there is a finite number of paths, since the contact points are finite, the load would be reduced to combinatorial processes, based on the rules of quantum geometry involved.

The so called ghosting effect would not be a paradox. A space-time continuum consists of a connected, hyper bulls, in a virtual vacuum, the change would allow a remote part of a point instantly, since in the virtual vacuum is not allowed "friction" of energy.

It's like turning several balls at once, with associated sprockets, except that in the virtual vacuum there is no loss of energy.

Dimensions, odd premiums less than or equal to eleven, only five of dimension can be factored in Gaussian integers (spherical Cartesian coordinates). This directly implies that the probability models based on strings of a particle in a box n dimensional, only and exclusively, these odds are factorable complex densities when the dimension is five. Obviously, all dimensions are factorable pairs.

But we are referring to a singular and unique fact :

$$3d + 5d + 7d + 11d = 26d\ ;\ 3d + 5d + 7d = 15d = dim[SO(6)] = \sum_s 2s + 1\ \ dim[SU(3)] + dim[SU(5)] + dim[SU(7)] = dim[SU(9)]$$
$$dim[SU(9)] = 2K(5d) = 80\ \ ;\ 3K(5d) = dim[SU(11)] = dim[SO(16)]$$

$$240 = 2dim[SO(16)] = \sum_{d=3}^{7} K(d) - K(5)\ \ ;\ [(11! + 5! + 7! + 3!) + (8 + \tfrac{\pi}{4})5!]/(m(VH)/m_e) = 2 \cdot R_p^2(26)$$
$$3^2 d + 5^2 d + 7^2 d \approxeq 2 \cdot (1 + \sin(2\pi/2\pi)\cos(2\pi/2\pi))^{10} - 1 - \sin(2\pi/2\pi) = 83.00060$$

Equivalence of the maximum quantity of particles of vacuum as the sum of spherical coordinates of dimensions 5, 7, 26 and 4. Lengths associated toric

1. $2\Big\{l_p^2(5)+R_p^2(5)+l_p^2(7)+R_p^2(7)+l_p^2(26)+R_p^2(26)+l_p^2(4)-[1+\sin(2\pi/R_p(5))]\Big\}+e^{-(7+20\Omega_b)}=240$

2. $2\Omega_b\approxeq 0.09161821$

3. The ten dimensions of unit length, as a sum of spherical coordinates.

$$\sqrt{l_p^2(5)+R_p^2(5)+l_p^2(7)+R_p^2(7)+l_p^2(26)+R_p^2(26)}\Big/[(l_p(4)-2)^{-1}-2]\ +\ [1+\sin(2\pi/2\pi)\cos(2\pi/2\pi)]/10^4=9.9999997$$

6.0.6 The complex power density of the string in five dimensions and the Heisenberg uncertainty principle

It is a simple relation showing the direct connection of the uncertainty of a particle in a one-dimensional string and the density of a one-dimensional string of length O-rings in five dimensions.

The relationship of uncertainty of a classical one-dimensional string to the ground state, n = 1:

$$\triangle x\triangle p/\hbar=\frac{1}{2}\sqrt{\frac{\pi^2}{3}-2}=0.5678618085\approxeq\psi(2,l_p(5))=0.5670830393\approxeq arg([\psi(2,l_p(5))]^{-i})=0.5672495322$$

6.0.7 The scaling of the ten dimensions and the Higgs vacuum

The equivalence principle mass-spacetime, implies that the virtual vacuum, the vacuum is not observable, and therefore there is no interference of the observer as there is no distinction between mass coordinates, space and time, being dimensions interchangeable.

The maximum number of particles in the vacuum (maximum number of sphere packing in eight dimensions, which play a central), 240; is a quintuple duplicate, the ground state of particles generated by the group SU(5)

A more fundamental state of the Higgs vacuum corresponds to the arithmetic mean due to the partition of the mass equivalent of the value of the Higgs vacuum, between the twenty-four particles of the first level, or fundamental level of particles in the vacuum. This amount of particles corresponds to the standard model particles to the maximum level of the top quark mass, and without Higgs bosons, generators of these masses.

$$10d\cdot 24=K(8d)\equiv 10d\cdot K(4d)\ \ ;\{24\}\equiv\big\{6l+6q+8g+1\gamma+Z+W^{+}+W^{-}\big\}$$

Since: $K(8d)/10=24\equiv SU(5)$; then the principle of equivalence requires that the arithmetic mean of the Higgs vacuum, it would be a function of the scaling of the ten dimensions.

And indeed so is:

$$24(\exp(10)-2^7)\cdot 10\cdot 2\Omega_b=481842.629=m(VH)/m_e\ \ ;\ 2\Omega_b=(2\ln(m_p/m_e)+\alpha^{-1})-240$$

But it can be shown that precisely the value of the Higgs vacuum is a mass loss due to the matter-antimatter asymmetry, which deforms the exact value of $dim[SU(5)]=24$

$$[(2\Omega_b^{-1})/\psi^{1/2^7}(2,R_p(7)]\cdot\exp(10)\ \ -l_p(5)\sin\beta=481842.894=m(VH)/m_e=246.221202\ Gev/(5.109989276\cdot 10^{-4}GeV)$$

Number of states mass basic switching of canonical operator for five dimensions, counting only mass commutations xp or px. $10d\equiv n_{+}(5d)$

6.1 The mass of the boson m_h and equivalence of scaling ten-dimensional

$\arctan 2 = \beta_2$; $\beta_2 \exp(P(2, R_p(5)) = 83.9928^\circ \approxeq \beta = 84^\circ$; $10d + (\tan\beta_2 - \tan[2\pi/dim[SO(6)]])^2 = 12.41731384$

$10d + (\tan\beta_2 - \tan[2\pi/dim[SO(6)]])^2 = \ln(m_h/m_e)$; $dim[SO(6)] \equiv \sum_s 2s+1 \equiv SU(4)$

$SU(4) \equiv basic\ operators\ group\ switching\ matrix\ mass$

6.2 Relations to the masses of the Higgs boson as a function of the ten dimensions, as equivalent to number of particles, and the probabilities of strings in five dimensions.Equivalence principle mass-space-time

In section 6.0.6, was established the following relationship:

$\triangle x \triangle p/\hbar = \frac{1}{2}\sqrt{\frac{\pi^2}{3} - 2} = 0.5678618085 \approxeq \psi(2, l_p(5))$

6.2.1 Interpretation of the inverse of the probability of a string as a fraction of the number of particles that contribute to certain states of the vacuum

The vacuum itself has to be considered as a state of space-time-mass. And this state is the unit, ie: $1 \equiv 2[(2/4)\sin^2(2\pi/4)] \rightarrow 2E(0) = 2(\frac{1}{2}\hbar\omega) \rightarrow (p, \overline{p})$ $\frac{1}{2}\left(\frac{2E(0)}{2(\frac{1}{2}\hbar\omega)}\right) = n(E(0)) = 1$ A pair virtual particle-antiparticle.

Therefore: $1/P(2, l_p(d)) \equiv n(p)$

$\hbar/\triangle x\triangle p \approxeq 1/\psi(2, l_p(5)) \approxeq\rightarrow 1/(2\psi(2, l_p(5)))^2 \equiv n(p)$; $n(p) = 1/4P^2(2, l_p(5))$

In paragraph 6.0.7, it was verified that the minimum of the vacuum state depends directly on the scaling of the ten dimensions. $10d \equiv 2(\sum_s s) \equiv$ ten terms of spin 1/2, to complete an operation of supersymmetry, which transforms a spin 0 boson in a graviton.

Finally, the total contribution to vacuum would be the sum of the dimensional contribution, and the inverse square of the probability of the string: $10 + 1/4P^2(2, l_p(5))$

Applying the scaling law, obtain the lowest boson mass Higss m_h , since the other state, $[10 + 1/4P^2(2, R_p(5))] > [10 + 1/4P^2(2, l_p(5))]$

Indeed, applying the law of change of scale, we obtain the mass of the Higgs boson, m_h

$10 + 1/4P^2(2, l_p(5)) = 12.41742704$, $\exp[10 + 1/4P^2(2, l_p(5))] = 247070.0157$

$(247070.0157/481842.894) \cdot 246.221202\ GeV = 126.252\ GeV$

Boson mass next to the smaller radius of the torus into five dimensions:

(26) $\exp[10 + 1/4P^2(2, R_p(5))] = \exp(13.17252574) = 525720.8987$; $(246.221202\ GeV) \cdot \frac{525720.8987}{481842.894} = 268.6428152\ GeV$

As demonstrated below, this is the boson $mA_0 = 268.6428152\ GeV$

6.2.2 Calculation of the mass of the Higgs bosons: m_{h_2} ; m_{h_3} ; m_H , $m_{H\pm}$

Seven Higgs bosons exist, it will show that the following with a mass greater than $m_h \approxeq 126.2\ GeV$; can be calculated as a function of the probability of a string of seven dimensions and other string in five dimensions.

The detail is very simple: if you got the Higgs boson mass of newly discovered as a direct function of the probability of a string in seven dimensions, with a length of $l_p(7)$; iimmediately follows that the following Higgs boson must be obtained by the smaller radius of compactification $R_p(7)$; necessarily exist as seven Higgs bosons, five of whom are the five spins equivalence, equivalence of the five dimensions that generate the group SU(5), then necessarily two Higgs bosons are string vibrations into seven dimensions. Therefore the following Higgs boson has to be completely dependent on a probability dependent minor radius of the torus, or a compound probability as a product of the probability densities of the two radii toric in seven dimensions.

$a)\ \ m_H = m_h/[\psi(2,l_p(7))\cdot\psi(2,R_p(7))] = 126.2\ \ GeV/(0.7158613636)(0.6993675658) = 252.132\ GeV$

$b)\ \ m_H = m_h/P(2,R_p(7)) = 126.2\ \ GeV/0.4891149921 = 258.017\ GeV$

As you can see the difference is very small, only 6 GeV. This difference appears to be expressible as: $(258.017\ GeV)\cdot\sin^4\beta = 252.409\ GeV$

Probability, that the product consists of two different densities, would give such mass is not a unique case, because the newly discovered Higgs boson can be calculated similarly as the product of the densities of a string in five dimensions and a string of dimension seven, the radius of the latter, the radius depends on the electromagnetic fine structure constant for a momentum = 0, that is: $\alpha^{-1} = 137.035999074$

Applying the same method as that used for obtaining the mass of the Higgs boson, mA_0 ;

in this case the dimensional change of scale is the sum of the dimensions of both strings, five and seven.

Calculation of the mass of the Higgs boson m_h as a function of the probability composed of strings in five and seven dimensions. String length: $l_\gamma = \sqrt{\alpha^{-1}/4\pi} = 3.3022686622 = R_p(7)/\cos^2\theta_{13} \approxeq R_p(7)+2+\cos^2\theta_{13}$

$l_\gamma \approxeq [(5\cdot l_p(5)\cos^2\theta_{13})^{-1}+1]l_p(7) = 3.302268056\ \ ;\ l_p(7)-l_\gamma = [\psi(2,R_p(5))R_p(5)]^8 + (m_{\tilde{t}}/m_t)^{-4}$

$m_h/m_e = \exp[7+5+\psi(2,l_p(5))\psi(2,l_\gamma)] = \exp[7+5+0.5670830393\cdot 0.7357617029] = 247023.3091$

$m_h = (246.221202\ GeV)(247023.3091/481842.894) = 126.228\ GeV$

Calculation of the mass of the Higgs bosons m_{h_2} , m_{h_3} , m_H , $m_{H\pm}$; the sum of the inverses of the probabilities of strings in five dimensions and dimensional constant, 10. Subsequently apply the law of change of scale. In this case, the probabilities are a function of the root of $1/4P^2(2,l_p(5))]$ and $1/4P^2(2,R_p(5))]$

$\sqrt{1/4P^2(2,l_p(5))]}/2 = 2/[d(P^2)]$; $d(P^2) = 2P$; $\sqrt{1/4P^2(2,R_p(5))]}/2$

$\ln(m_H/m_e) = 10 + P^{-1}(2,l_p(5)) = 10 + 3.109615435$; $(5.109989276\cdot 10^{-4}GeV)\exp(13.109615435) = 252.26\ GeV$

$\ln(m_{h_3}/m_e) = 10 + P^{-1}(2,R_p(5)) = 10 + 3.562317078$; $(5.109989276\cdot 10^{-4}GeV)\exp(13.562317078) = 396.69\ GeV$

The charged boson require its probability is multiplied by ten, because of the three colors of quarks and the sum of the absolute value of electrical charges, ie:

$$3\left[|\tfrac{-1}{3}| + |\tfrac{2}{3}| + |\tfrac{-3}{3}| + |\tfrac{4}{3}|\right] \equiv 10d \equiv 2\sum_s s$$

$\ln(m_{H\pm}/m_e) = 10 + 10\cdot P(2,l_p(5) = 13.21583174$; $(5.109989276\cdot 10^{-4}GeV)\exp(13.21583174) = 280.53\ GeV$

In summary, we have the following masses: $m_H = 252.26\ GeV$, $m_{h_3} = 396.69\ GeV$, $m_{H\pm} = 280.53\ GeV$

The mass of the remaining two bosons: m_{h_2} and ma_1 ; be based on the conjecture that these two bosons are a function of the product of probability densities for the two lengths toric.

Thus:

$\ln(m_{h_2}/m_e) = 10 \ + 1/[\psi(2,l_p(5)) \cdot \psi(2,R_p(5))] \to m_{h_2} = 313.91\ GeV$

$ma_1 = (246.221202\ GeV) \cdot f(P(2,l_p(5)) \cdot P(2,R_p(5)) \to ma_1 \leq 22.22\ GeV$

6.2.3 Mass of light CP-even Higgs boson ma_1

Since supposedly know the exact angle β ;then you can get the mass of this boson, using the equation of the correction of the muon anomalous magnetic moment, by the contribution of this mass.

This equation, neglecting the contributions of the masses $m_{H\pm}$, mA_0 ,is:

$$\frac{m_\mu^2 \cdot G_F}{4\pi^2\sqrt{2}} \tan^2\beta \left\{ \frac{m_\mu^2}{ma_1^2} \left[\ln\left(\frac{m_\mu^2}{ma_1^2} \right) - \frac{7}{6} \right] \right\}$$

As the difference between the experimental value of muon anomalous magnetic moment, and the theoretical value $\simeq 2.55 \cdot 10^{-9}$. You can get the mass of this boson, solving the following equation:

$$\frac{m_\mu^2 \cdot G_F}{4\pi^2\sqrt{2}} \tan^2\beta \left\{ \frac{m_\mu^2}{ma_1^2} \left[\ln\left(\frac{m_\mu^2}{ma_1^2} \right) - \frac{7}{6} \right] \right\} - 2.55 \cdot 10^{-9} = 0 \quad , \ G_F = 1.166364 \cdot 10^{-5}\ (GeV)^{-2} \ , \ m_\mu = 0.10565\ GeV$$

$\beta = 7 \cdot 2\pi/30 \approxeq \sqrt{\rho(5d)} = \sqrt{\pi^2\sqrt{2}/30}$, $\rho(5d)$ (packing density of spheres in five dimensions)

The solution of the equation gives two solutions : a) 2.11096176 GeV. b) 0.1931875 GeV

We support the solution a), because it can be expressed as :

$a)\ ma_1 = \left\{ (246.221202\ GeV) \cdot [P(2,l_p(5)) \cdot P(2,R_p(5)] \right\} \Big/ (10 + \psi(2,R_p(5)) = 2.1108869\ GeV$

$b)\ [P(2,l_p(5)) \cdot P(2,R_p(5)]^{-1} / \cos 2\theta_{13} = 11.70640477 \simeq \sqrt{\alpha^{-1}} = 11.70623761$

6.3 Verification test of some masses obtained by applying the equations of the model MSSM and NMSSM

The first test is done with bosons mA_0 , $m_{H\pm}$

According to the models MSSM and NMSSM, we have the following relations:

1. MSSM $m_{H\pm}^2 = mA_0^2 + m_W^2$; $mA_0^2 + m_W^2 = 268.64^2 + 80.378^2 = 78628.07\ (GeV)^2$
2. $m_{H\pm}^2 = 78697.08\ (GeV)^2$, $\delta m = 78697.08 - 78628.07 = 69.01\ (GeV)^2$
3. NMSSM $m_{H\pm}^2 = mA_0^2 + m_W^2 - \frac{\lambda^2 v^2}{2}$; $(\lambda^2 v^2)/2 = (29.568/2)^{-2}(174.104)^2 = 69.34\ (GeV)^2$
4. $69.34\ (GeV)^2 \approxeq \delta m = 78697.08 - 78628.07$
5. MSSM test masses $m_h^2 + m_H^2 = mA_0^2 + m_Z^2$; $m_h^2 + m_H^2 = 126.22^2 + 252.26^2 = 79566.596\ (GeV)^2$
6. $mA_0^2 + m_Z^2 = 268.64^2 + 91.1876^2 = 80482.62\ (GeV)^2$ $\delta m = 80482.62 - 79566.596 = 916.03\ (GeV)^2$

7 Conclusion

The results obtained for the value of the Higgs vacuum, and the newly discovered boson mass of about 126 GeV, using probabilities of strings in five and seven dimensions, we makes us think that the masses obtained for the rest of bosons, especially: mA, MH + -, MH, and ma1, are likely to be correct. Similarly, the theoretical mass obtained for the stop, think that is correct. However it must be very cautious, because they are using a device string theorist, very partially developed, using semiempirical arguments The equivalence principle mass-space-time, on the contrary, we are sure of being right

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