Contents

The God particle: The Higgs boson, extra dimensions and the particle in a box

Author: A.Garcés Doz

angel1056510@gmail.com

Abstract

In this paper we show as the lightest Higgs boson, is directly linked to the existence of seven dimensions compacted Kaluza-Klein type, and four extended. The model of a particle in a box allows us to calculate, using the extra dimensions as entries in the well-known equations of this model, the mass of the lightest Higgs boson. This estimate coincides with complete accuracy with that obtained in our previous work, "God and His Creation: The Universe", using the well known quantum mechanical model of a particle in a spherically symmetric potential. Both load match and result in a mass for the lightest Higgs boson of 126.23 Gev - 126.17 Gev

1 Introduction

The main feature that comes from getting the value of the mass of the lightest Higgs boson is the uniqueness of the solution. We refer to the uniqueness, as interconnected mathematical properties of some well known groups in unification theories, unique and extraordinary. Ultimately, these are derived from mathematical properties of a single solution that only have certain integers, also well known in the theories of unification. These integers are mainly: 1, 2, 3, 4, 5, 8, 7, 24 and 71. It includes a special way, the numbers of the Fibonacci series, especially those who are dividers of 240. In our previous work these integers of the Fibonacci series are well explained and used.

The properties of octonions and quaternions, which allow the winding in seven dimensions, the toric states derived from the three-dimensional extended

2 Unique and extraordinary properties

These properties, interdependent, one could classify as follows:

1. Properties of specific groups. These principal groups are as follows: E8 group, which allows breaking the vacuum by groups E6 and SU(3). God and His Creation: the Universe

2. The groups SU(11), SU(8), SU(7), SU(6), SU(5), SU(4), SU(3), SU(2) and U(1)

3. Groups of rotations: SO(2), SO(3), SO(4), SO(5), SO(6), SO(7), SO(8), SO(9), SO(13) and SO(26)

- a) $\left(\sum_{n=1}^{7} dim[SO(n)]\right)\Big/2 = dim[SO(8)] = 2dim(G2)$
- b) $\left(\sum_{F_n/240} dim[SU(F_n)]\right) = dim[SU(10)]$; $(8! + 2dim[F_4])/248 = 163 = 240 - dim[E6] + dim[U(1)]$
- c) 5 spins. $5! = dim[SU(11)] = \sum_{n=1}^{9} dim[SO(n)] = 1/\zeta(-3) = 1/2\zeta(-7)$ $\quad dim[SU(4)] = \sum_{s} 2s + 1$
- d) $dim[SO(6)] = dim[SU(4)]$
- f) -7 And -3 are the sum of the squares of the imaginary values of octonions and quaternions. $(-7)(-3) = 21 = dim[SO(7)] = F_8$; F_8 = eight Fibonacci number. $7 + 3 = 10D$; $8 + 3 = 11D$, $8 \times 3 = dim[SU(5)] = dim[SU(3)] \times dim[SU(2)] \times dim[U(1)] = 4!$; $7 + 4 = 11D$, $7 \times 4 = dim[SO(8)]$ 8 octonions, plus the 3 imaginary values of the quaternions. 4 quaternions, plus the 7 imaginary values of the octonions. $dim[SO(8)] + dim[SU(5)] = dim[F_4] = 52 = \left(\sum_{F_n/240} F_n^2\right)\Big/2$
- g) $6! = dim[SU(7)] \times dim[SU(4)]$; $dim[SU(7)] + dim[SU(4)] = dim[SU(8)]$
- h) God and His Creation: the Universe (section, 3.1.1 "Maximum number of particles in the vacuum"). $8! = 240 \times dim[SU(13)]$; $\left[8! + \left(\sum_{F_n/240} F_n^2\right)\right] = dim[E8] \cdot 163$
- $\sum_{n=0}^{6-n} \sum_{F_n/240} F_n^2 = dim[SU(13)] = 240 - dim[E6] + dim[SO(4)]$
- $\{F_n/240\} = \{1*, 1, 2, 3, 5, 8\}$ $\sum_{n=0}^{6-n} \sum_{F_n/240} F_n^2 = dim[SU(13)] = 240 - K(6D)$; $K(nD) = Kissing\ Number\ n\ Dimensions$
- I) Special factorials. It is known that the amount of factorials who meet the property: $n! + 1 = x^2 \iff SU(x) = n!$ has a finite number of solutions, and probably only, the following: $SU(5) = 4!$, $SU(11) = 5!$; $SU(71) = 7!$; $(K(6D))^2 = 7! + 5! + 4!$, $7!/dim[SU(7)] = 1 + \sum_{F_n/240} F_n^2 = 1 \cdot 3 \cdot 5 \cdot 7$
- $7!/dim[SO(7)] = 240$
- $K(24D) = 7!(dim[SU(5)] + dim[SU(4)] = dim[E6]/2) = 196560$
- j) Fundamental angles. Only the partition of the circle by the eight octonions allows a minimum probability of 1/2, fully compatible with the Heisenberg uncertainty principle. Similarly, only with these eight octonions and four quaternions, you can generate the toric states windings. These states are generated by toric multistate three dimensions, plus the time dimension. Since, the equations resulting from the model of a particle in a box, are well known by all, will direct these equations for the relevant calculations.

3 Equations derived from the model of a particle in a box

1. For the particle in a box, the probability density for finding the particle at a given position depends upon its state, and is given by: (1) $P(x) = |\psi(x)|^2$; (1) $P_n(x) = \begin{cases} (2/L)\sin^2(n\pi x/L) \;;\; 0 < x < L \\ 0 \;;\; otherwise \end{cases}$
2. Where, L is the length of the box and n is the number of state. P(x) is the probability.
3. The variance in the position = measure of the uncertainty in position of the particle. (2) $Var(x) = \frac{L^2}{12}\left(1 \;-1/n^2\pi^2\right)$
4. Variance in the momentum. (3) $Var(p) = \left(\hbar n\pi/L\right)^2$
5. The uncertainties in position and momentum. (4) $\triangle x \triangle p = \frac{\hbar}{2}\sqrt{\frac{n^2\pi^2}{3} - 2}$

For dimensionless numbers to the lengths of the box, the ratios of lengths used with respect to the Planck length.

$l_p = \sqrt{\hbar c/G_N}$; $l_p/l_p = 1$ (5) For the ground state of the vacuum, with n = 1, the only possible solution for 1/2 probability of equation (1) is:

(6) $(2/4)\sin^2(2\pi/4) = 1/2$; $x = 2$; $n = 1$; $(2/4)\sin^2(2\pi/4) = \sin^2(2\pi/8)$. Where $2 = 2l_p/l_p = x$, 2 is derived from the zero point energy of vacuum: $E_0 = \frac{1}{2}\hbar\omega$; $\omega = \omega_p = c/l_p$ $E_0 = \frac{1}{2}\hbar\omega \rightarrow c\Big/\frac{1}{2}\omega_p = 2c/\omega_p = 2l_p$

(7) $2l_p/l_p = 2$; $2^2(l_{px}) + 2^2(l_{py}) + 2^2(l_{pz}) + 2^2(l_{pt}) = 16$; $\sqrt{16} = 4l_p/l_p = 4$. Really the result obtained by (6), represents the dimensionless ratio of two lengths about planck length, with a trigonometric factor which gives the probability. This probability of 1/2 is completely equivalent to the minimum possible value of uncertainty, on the principle of Heisenberg. With the condition of knowing precisely the momentum of the particle

Proposition 1. *(8)* $(2/4)\sin^2(2\pi/4) = \sin^2(2\pi/8) = 1/2 = min(\triangle x \triangle p/\hbar)$

3.1 Generation of the eight dimensions as different states of three and four dimensions

The unique solution with probability 1/2, equivalent to the minimum possible uncertainty (Heisenberg principle) implies the division of the circle into eight parts. The octonions are what allow this partition, as well as the generation of toric states, using the multistate three and four dimensions, the winding two-dimensional (square of imaginary values of octonions and quaternions). God and His Creation: the Universe (section, 3.3 “The cosmological vacuum”, pag 34-39)

3.1.1 toric 2- dimensions states

$$\begin{matrix} xy & yx \\ xz & zx \\ yz & zy \\ xx & zz \end{matrix} ; \begin{matrix} xy & yx \\ xz & zx \\ yz & zy \\ xx & yy \end{matrix} ; \begin{matrix} xy & yx \\ xz & zx \\ yz & zy \\ yy & zz \end{matrix} \rightarrow 8 \cdot 3 = 24 \; states = 8D \cdot 3D$$

3.1.2 toric 3- dimensions states

$$\begin{matrix} xyz & xzy \\ yzx & yxz \\ zxy & zyx \\ xxy & xxz \end{matrix} ; \begin{matrix} xyz & xzy \\ yzx & yxz \\ zxy & zyx \\ yyx & yyz \end{matrix} ; \begin{matrix} xyz & xzy \\ yzx & yxz \\ zxy & zyx \\ zzx & zzy \end{matrix} \rightarrow 8 \cdot 3 = 24 \; states = 8D \cdot 3D$$

3.1.3 toric 4- dimensions states

$P!(xyzt) \rightarrow 8 \cdot 3 = 24 \; states = 8D \cdot 3D$

3.1.4 Quaternions and Octonions

Cuaternions Four and three dimensions (two solutions): a) $i^2 + j^2 + k^2 + 1^2 = -3 \rightarrow torus \rightarrow factor \; 4\pi^2 \; surface$

- $-3 \rightarrow$ negative curvature, inner surface of the torus
- b) $i^4 + j^4 + k^4 + 1^4 = 4 \rightarrow sphere \; 4D \rightarrow factor \; \pi^2/2 = (4\pi^2)/8 \; volume$

Octonions Eight and seven dimensions (two solutions):

- a) seven dimensions: $\sum_{e_0}^{7} e_n^2 = -7 \rightarrow$ negative curvature, inner surface of the torus
- b) eight dimensions: $\sum_{e_0}^{7} e_n^4 = 8$
- $\left(-\sum_{e_0}^{7} e_n^2\right)\left(\sum_{e_0}^{7} e_n^4\right)\Big/2 = dim[SO(8)]$
- $2 \cdot dim[SU(5)] = 2 \cdot 24 = 2 \cdot 4! = dim[SU(7)]$
- $\sum_{n=1}^{24}(-n)^2 + \sum_{n=1}^{24} n^2 = 70^2 + 70^2$
- $\binom{8D}{4D} = 70$
- $\binom{8D}{3D} = \left(\sum_{n=1}^{7} dim[SO(n)]\right)$
- $\binom{10D}{7D} = 5! = dim[SU(11)]$

- $70^2 + 2 \cdot 70 = 7!$
- $\left(dim[SU(5)]\right)^2 + dim[SU(10)] = dim[SU(26)]$
- $dim[SU(26)] = dim[SO(9)] \times dim[SO(6)]$; $dim[SO(9)] + dim[SO(6)] = dim[SU(11)]/2$
- $\sum_{d/24} d = dim[SU(11)]/2$
- $\{d/24\} = \{1, 2, 3, 4, 8, 6, 12, 24\}$; $\{d_1/24\ , d_1 = 2^n\ , n \leqq 3\} = \{1, 2, 4, 8\}$
- $\{d_2/24\} = \{d/24\} - \{d_1/24\} = \{3, 6, 12, 24\}$; $\sum_{d_2/24} d_2 = dim[SO(9)]$
- $\sum_{d_1/24} d_1 = dim[SO(6)]$

4 Introduction to the seven dimensions Kaluza Klein compacted

Compactification in circles, for the ratios of the seven dimensions with respect to the Planck length, was based on the well known results. These calculations are presented in our previous work (God and His Creation: the Universe , section 4 "Calculation of dimensions 7D-spherical torus and its possible implications", pag 41), based on "Black holes and the existence of extra dimensions", Rosemarie Aben, Milenna van Dijk, Nanne Louw.

Proposition 2. *The model of the torus of seven dimensions, assume that the smaller dimension of the torus corresponds to a black hole.*

With this assumption, the lengths of these seven toric dimensions, with respect to the Planck length, are:

$$l_P(D)/l_P = \frac{\left(\hbar G_{d+4} \Big/ c^3\right)^{1/(d+2)}}{\left(\hbar G_N \Big/ c^3\right)^{1/2}} = \left(2(2\pi)^d \Big/ \left[2\pi^{d/2}/\Gamma(d/2)\right]\right)^{\frac{1}{d+2}}$$

- $l_P(7D) = 3.0579009561024$
- The ratio of the length of a black hole d dimensional respect to the Planck length would be:
- $R_H(D) = R_H(d)/l_p = \left(4(2\pi)^d \Big/ \left[2\pi^{d/2}/\Gamma(d/2)\right] \cdot (d+1)\right)^{\frac{1}{d+1}}$
- $R_H(7D) = 2.956949058224$

Proposition 3. *Will be added the third length, depending on the fine structure constant:*

$l_\gamma = \sqrt{\frac{\alpha^{-1}}{4\pi}} = 3.30226866228015$

Proposition 4. *Using equation (7), we have:* $2 + 4 \leqq l_p(7D) + R_H(7D)$

$6 < l_p(7D) + R_H(7D) = 6.014850014$

Applying the minimum value of uncertainty, 1/2, according to the Heisenberg uncertainty principle, according to equation (8), the minimum value for the Higgs vacuum, its wavelength would be:

$\lambda_{VH}/min(\lambda_H) = 1/2$; *where* λ_{VH} *Is the wavelength of the Higgs vacuum.* λ_H *Is the wavelength of Higgs boson lower mass*

- $m_H \geqq m(VH)(1/2) \rightarrow m_H \geqq 123\ Gev$

5 Calculating mass of less massive Higgs boson

Proposition 5. *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:*

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

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

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

- $m_H(Gev) = (246.22\ Gev)0.51245749179704 = 126.177\ Gev$

Remark. $1/(-2\sin[2\pi/(4/\pi)]) \approxeq P(2, l_P(7D))$

$$m_H/m_e \approxeq 7!(dim[SO(7)] + dim[SO(8)] = 7^2) = \frac{m(VH)(2/3.0579009561024)\sin^2(2\pi/3.0579009561024)}{m_e}$$

$$(7!5!4!/60)/\cos^4(2\pi/60) \approxeq [dim\ real(E8)]^2 + 32^2 = 247040 \approxeq m_H/m_e$$

God and His Creation: the Universe (section 4.5, "Particle in a spherically symmetric potential, the Higgs vacuum, the spins and the change of scale according to equation (11)")

Conjecture. $\sin^2 2\theta_{13} = (l_\gamma - R_H(7D))/l_\gamma$; $\theta_{13} = angle\ vacuum\ neutrino\ oscillation$

$\theta_{13} = 9.4335312^{\underline{o}}$

- $\sin^2 2\theta_{13} = 0.1045704145$

"Observation of Reactor Electron Antineutrino Disappearance in the RENO Experiment", arXiv:1204.0626v1 [hep-ex] 3 Apr 2012

"The RENO experiment has observed the disappearance of reactor electron antineutrinos, consis- tent with neutrino oscillations, with a significance of 6.3 standard deviations. Antineutrinos from six 2.8 GWth reactors at Yonggwang Nuclear Power Plant in Korea, are detected by two identical detec- tors located at 294 m and 1383 m, respectively, from the reactor array center. In the 229 day data- taking period of 11 August 2011 to 26 March 2012, the far (near) detector observed 17102 (154088) electron antineutrino candidate events with a background fraction of 4.9% (2.7%). A ratio of ob- served to expected number of antineutrinos in the far detector is 0.922±0.010(stat.)±0.008(syst.). From the deficit, we find $\sin^2 2\theta_{13} = 0.103 \pm 0.013(\text{stat.}) \pm 0.011(\text{syst.})$ based on a rate-only analysis."

Proposition 6. $P(2, l\gamma) = (2/l\gamma)\sin^2(2\pi/l_\gamma) = 0.54134528$

- $P(2, l\gamma)m(VH)\cos 2\theta_{13} \approxeq m_H$

Remark. (2) $Var(x) = \frac{L^2}{12}\left(1 \; - 1/n^2\pi^2\right)$

- $n = 1$; $Var(l_\gamma, \theta_W(GUT)) = \frac{l_\gamma^2 \sin\theta_W(GUT)}{12}\left(1 \; - 1/n^2\pi^2\right) \approxeq 1/2$

Remark. $l_p^2(7D)/\cos^4\theta_{13} \approxeq \pi^2/[1 \; + 1/\{(\ln[m_H/m_e] - 11)\ln^2[m_p/m_H]\})]$

Proposition 7. *The uncertainties in position and momentum. (4)* $\triangle x \triangle p = \frac{\hbar}{2}\sqrt{\frac{n^2\pi^2}{3} - 2}$

God and His Creation: the Universe (section 4.5, "Particle in a spherically symmetric potential, the Higgs vacuum, the spins and the change of scale according to equation (11)")

- $n = 1$; $(\triangle x \triangle p/\hbar)^2 = (\pi^2 - 6)/12$
- $V_{eff}(r) = V(r) + \frac{\hbar^2 s(s+1)}{2m_0 r^2}$

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

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

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

Isolating the spins:

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

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: $\sum\limits_s s(s+1) = \sum\limits_{x_1,p_1}^{x_5,p_5} \frac{(\triangle x \triangle p)^2}{\hbar^2}$

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

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

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:

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

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

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

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

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

- $\sum_s s(s+1)/[(\pi^2-6)/12] = \ln[m_p/(m_H/\sin(2\pi/8))]$; $m_p = Planck\ mass$

- $\psi(2, l_p(7D), R_H(7D)) = \sqrt{2^2/l_p(7D)\cdot R_H(7D)}\sin[2\pi/l_p(7D)]\sin[2\pi/R_H(7D)] = \frac{1}{2} + (\cos[2\pi/60]/\ln^2[m_p/m_H])$

Remark. $(dim[SU(5)]/2) + [\sin^2(2\pi/l_P(7D))\sin^2(2\pi/R_H(7D))\sin^2(2\pi/l_\gamma)\sin^2(2\pi/\pi)] \approxeq \ln(m_H/m_e)$

$(2^4/l_P(7D)\cdot R_H(7D)\cdot l_\gamma\cdot\pi)[\sin^2(2\pi/l_P(7D))\sin^2(2\pi/R_H(7D))\sin^2(2\pi/l_\gamma)\sin^2(2\pi/\pi)] \approxeq 1/dim[G2]$

- $2\cdot Var(l_\gamma, n=1) = \frac{2l_\gamma^2}{12}\left(1-\frac{1}{\pi^2}\right)$; $\left[2\cdot Var(l_\gamma, n=1) + 7!\right]7^2 = 247040 \approxeq m_H/m_e$

6 Several observations

Remark. $\left(1+\frac{1}{2}\sqrt{\frac{\pi^2}{3}-2}\right)\Big/ l_p(7D) \approxeq [2/l_p(7D)]\sin^2[2\pi/l_p(7D)] \rightarrow \left(1+\frac{1}{2}\sqrt{\frac{\pi^2}{3}-2}\right)\Big/ l_p(7D) \approxeq m_H/m(VH)$

- $\triangle x\triangle p/\hbar = \frac{1}{2}\sqrt{\frac{\pi^2}{3}-2}$; $n=1$

- $(7!+1!+\sin\theta_W(GUT))7^2 \approxeq 247040 \approxeq m_H/m_e$

- $\left(2^7/R_H^7(7D)\right)\sin^7[2\pi/R_H(7D)] \approxeq 1/dim[SU(7)]$

- $\left[\left(2+4-\sqrt{\frac{\pi^2}{3}-2}\right)\Big/\frac{1}{2}\sqrt{\frac{\pi^2}{3}-2}\right]+1 \approxeq \sin^{-2}2\theta_{13} \approxeq \sin^{-1}(2\pi/60)$

- $137 + 2/[55+(1-\pi^{-2})-\tan 2\theta_{13}] \approxeq \alpha^{-1}$; $55 = F_{10} = \left(\sum_{n=1}^{7} dim[SO(n)]\right) - dim[U(1)]$

- $1/(10\cdot\sin^2 2\theta_{13}) \approxeq \sin(4/\pi)$

- $\left[(2/l\gamma)\sin^2(2\pi/l_\gamma)\right]^2 \approxeq \cos(4/\pi)$; $\sin(\pi/4) = \cos(\pi/4)$

- $\sqrt{2} \approxeq [\sin^2(4/\pi)+\sin^2(\pi/4)] + R_H^{-8}(7D)$

- Muon mass: $m_\mu/m_e = \exp\left(2\cdot Var[R_H(7D), n=1]+1\right)^2 - \sqrt{\cos(2\pi/5)}$

- $Var(l_p(7D), n=1) = \frac{l_p^2(7D)}{12}\left(1-\frac{1}{\pi^2}\right)$; $Var(l_p(7D), n=1)/7 \approxeq l_p(7D) - R_H(7D)$

- $2\cdot\exp\left[dim[SU(5)]\left(\frac{2}{l_p(7D)}\sin^2[2\pi/l_p(7D)]\right)\right]\Big/\left(1+\cos^2\theta_W\right) = m_H/m_e$

- $(l_p^2(7D)/12)^2 \approxeq l_p^2(7D) - R_H^2(7D)$

---

7 conclusion

We think that the results leave little doubt of the existence of compactied dimensions, and its natural connection with the minimum value of the Higgs vacuum: the Higgs boson of mass less.

[1]

References

[1] Observation of Reactor Electron Antineutrino Disappearance in the RENO Experiment, arXiv:1204.0626v1 [hep-ex] 3 Apr 2012

[2] Black holes and the existence of extra dimensions, Rosemarie Aben, Milenna van Dijk, Nanne Louw

[3] Particle Data Group, http://pdg.lbl.gov/2011/html/computer_read.html

[4] God and His Creation: The Universe, http://vixra.org/abs/1202.0064, A.Garcés Doz

[1] **I would like to thank to Sir Philip Gibbs for allowing me to expose these humble research**