Experiments with powerful neodymium magnets: Magnetic repulsion.Phenomenological equivalences: The reverse Casimir effect, or repulsive (spherical shell) and the spherical shell of the macroscopic Universe (obsevable sphere of the Universe). The quantum-mechanical origin of the repulsive acceleration, or cosmological constant.Vacuum value.

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Abstract

The experiments, conducted by the author; demonstrate the physical equivalence between the repulsion between two powerful Neodymium magnets and reverse Casimir effect (nanoscale) and macroscopic scale (The spherical shell of actual observable Universe); and as measuring weight on an electronic balance of this repulsive force, it causes the appearance of a fictitious mass; dependent on the repulsive force between the two magnets. One of these magnets is positioned above the balance; while the other slowly magnet is positioned right in the perpendicular axis that would link the centers of both circular magnets. (Circular disks). There is no difference between this experiment and the physical results of the experiments carried out at the microscopic level and measured experimentally: The reverse Casimir effect of a conducting spherical shell. The actual comportment of the Universe to macroscopic scales; with the manifestation of an accelerated expansion and the emergence of a fictitious mass, which does not exist; the so-called dark matter. The three physical phenomena with identical results are equivalent; so they could have a common physical origin. In the article, we have inserted links to videos uploaded to youtube that let you see the whole experimental process and its results. The last experiment is made with other balance; more shielded against interference magnetism and the magnet placed over the balance.

The videos are explained in Spanish. They are welcome English subtitles.

Acknowledgements.

I thank Almighty God and our Lord Jesus Christ, our Savior; for allowing me this little knowledge of its infinitude

1 Introduction.

https://en.wikipedia.org/wiki/Casimir_effect

1.1 Casimir effect

"Dutch physicists Hendrik Casimir and Dirk Polder at Philips Research Labs proposed the existence of a force between two polarizable atoms and between such an atom and a conducting plate in 1947, and, after a conversation with Niels Bohr who suggested it had something to do with zero-point energy, Casimir alone formulated the theory predicting a force between neutral conducting plates in 1948; the former is called the Casimir–Polder force while the latter is the Casimir effect in the narrow sense. Predictions of the force were later extended to finite-conductivity metals and dielectrics by Lifshitz and his students, and recent calculations have considered more general geometries. It was not until 1997, however, that a direct experiment, by S. Lamoreaux, described above, quantitatively measured the force (to within 15% of the value predicted by the theory),[6] although previous work [e.g. van Blockland and Overbeek (1978)] had observed the force qualitatively, and indirect validation of the predicted Casimir energy had been made by measuring the thickness of liquid helium films by Sabisky and Anderson in 1972. Subsequent experiments approach an accuracy of a few percent.

Because the strength of the force falls off rapidly with distance, it is measurable only when the distance between the objects is extremely small. On a submicron scale, this force becomes so strong that it becomes the dominant force between uncharged conductors. In fact, at separations of 10 nm—about 100 times the typical size of an atom—the Casimir effect produces the equivalent of about 1 atmosphere of pressure (the precise value depending on surface geometry and other factors).[7]

In modern theoretical physics, the Casimir effect plays an important role in the chiral bag model of the nucleon; in applied physics, it is significant in some aspects of emerging microtechnologies and nanotechnologies.[8]"

Casimir force: two conductive plates separated by a distance, d:

$$\frac{F_c}{A} = -\frac{\hbar \cdot c \cdot \pi^2}{240 \cdot d^4} \quad (1)$$

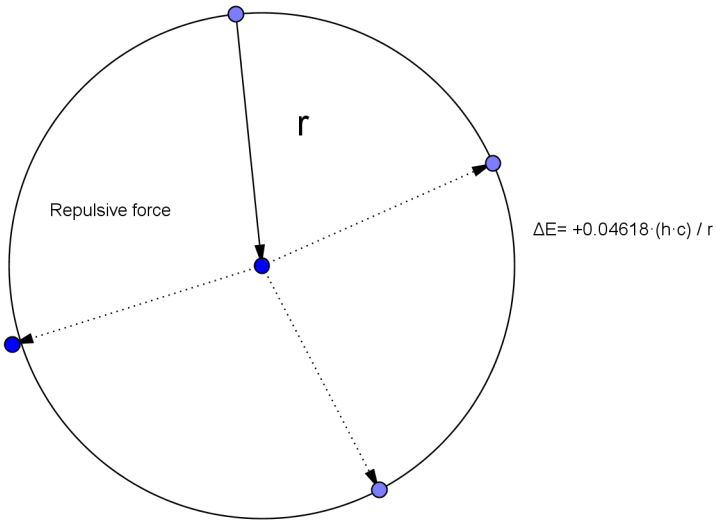
1.2 Reverse Casimir effect: repulsion.

https://en.wikipedia.org/wiki/Casimir_effect

Repulsive forces.

"There are few instances wherein the Casimir effect can give rise to repulsive forces between uncharged objects. Evgeny Lifshitz showed (theoretically) that in certain circumstances (most commonly involving liquids), repulsive forces can arise.[37] This has sparked interest in applications of the Casimir effect toward the development of levitating devices. An experimental demonstration of the Casimir-based repulsion predicted by Lifshitz was recently carried out by Munday et al.[38] Other scientists have also suggested the use of gain media to achieve a similar levitation effect,[39] though this is controversial because these materials seem to violate fundamental causality constraints and the requirement of thermodynamic equilibrium (Kramers-Kronig relations). Casimir and Casimir-Polder repulsion can in fact occur for sufficiently anisotropic electrical bodies; for a review of the issues involved with repulsion see Milton et al.[40]"

1.2.1 *Quantum Electromagnetic Zero-Point Energy of a Conducting Spherical Shell. T.H Boyer*



$$\triangle E(r) = +0.04618 \cdot \frac{\hbar \cdot c}{r} \quad (2)$$

2 **Kimball A Milton, E K Abalo, Prachi Parashar and Nima Pourtolami, Repulsive Casimir and Casimir-Polder Forces, http://arxiv.org/abs/1202.6415v2**

2 Features and photographs of the elements involved in the experiments.

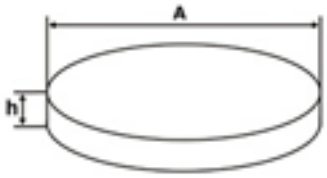
Two discs: Neodymium magnets, 30 mm in diameter and a thickness of 5 mm (N35D305 30 mm

5 mm).

Neodymium magnets are made of rare earth alloy Ne.Fe.B. They are magnets with a strong tendency to corrosion so they need a protective coating, Nickel-Zinc-Silver or silver usually.

They are powerful magnets, about 6 times the Anisotropic Ferrite. They are specially designed to reduce size and increase power.

http://laboutiquedeliman.com/neodimio.html



2.1 Balances

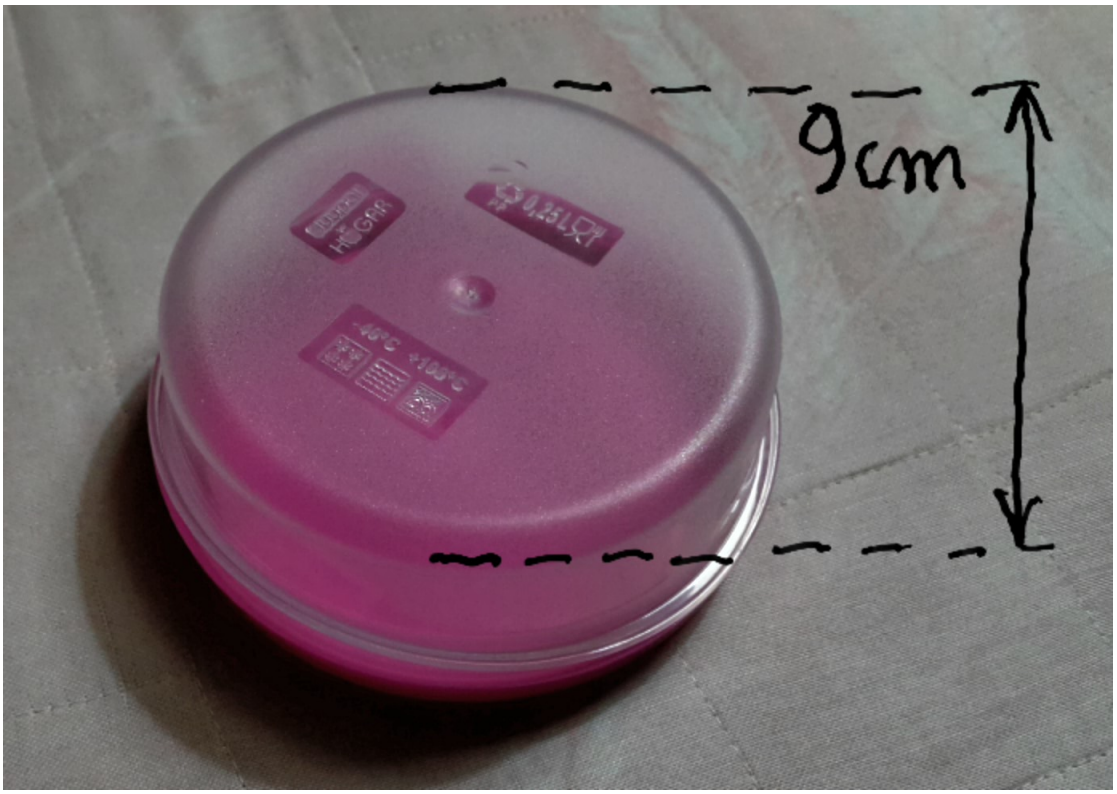
Electronic and maximum weight of 5 Kg, two electronic balances. One with a support for the weight, glass; to increase protection against magnetic fields.


UNIT
TARE
ON
93.032 MAX 5kg/d=1g

2.2 Magnets

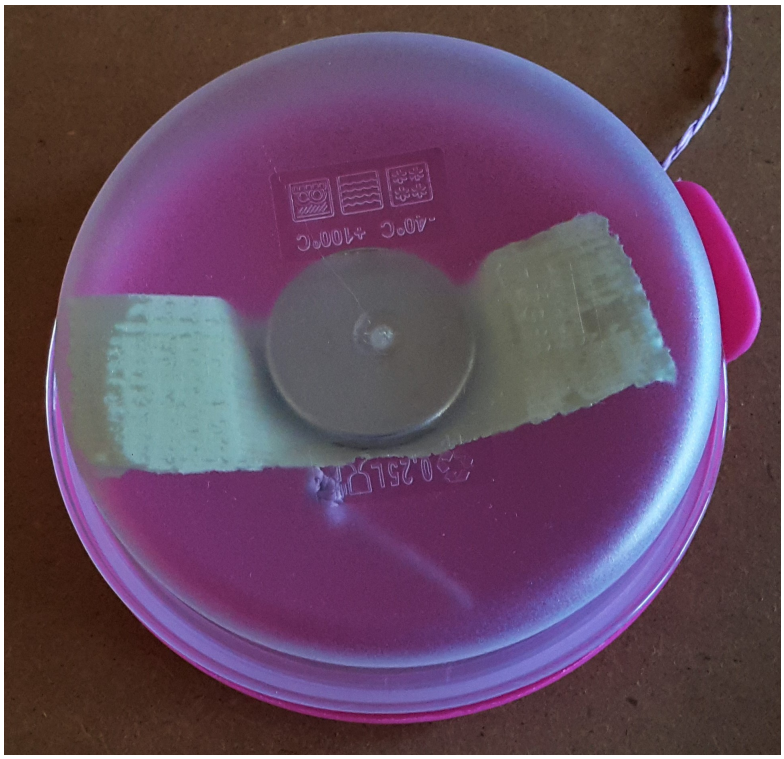
2.3 Circular box with hermetic cover.

Inside is placed in the center, one of the magnets; duct taped together.The polarity of the lower surface of this magnet is equal to the polarity of the other magnet attached in the middle of a CD case.



2.4 Plastic box disassembled.

2.5 Circular box with one of the magnets attached in its center



3 First experiment of repulsion of the two Neodymium magnets.

The balance increases its fictitious mass; caused by increased repulsion between the two magnets; and the consequent increased pressure on the balance; which detects a weight gain and therefore a non-real fictitious mass.


Tefal
94
g
tara


127
g
tara


129
g
tara


tefal
96
g
tara

4 Second experiment with the same configuration of the magnets. Balance with glass support. Increased magnetic insulator.

In this second experiment the balance is set to tare; such that the weight gain (fictitious mass, not real) is a measure of the pressure of repulsion between the two neodymium magnets. What is shown is the equivalence between this fictitious mass, and (not real, called dark matter) fictitious mass that generates repulsion energy of vacuum to the macroscopic scale of the Universe. It is the same physical effect. Repulsion, which produces the continuous expansion of the Universe.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93.032 MAX.5kg/d=1g

4.1 Videos of experiments: youtube links

0. Experimento de repulsión entre imanes de Neodimio.Parte I
   https://www.youtube.com/watch?v=Dk5sMXQRrC8

   1. Experimento Parte II. Experimento de repulsión entre imanes de Neodimio.
      https://www.youtube.com/watch?v=xHIUQAkHB_g

   2. Experimento Parte III. Experimento de repulsión entre imanes de Neodimio.
      https://www.youtube.com/watch?v=HmBEBzM7ZUY

   3. Experimento Parte IV. Experimento de repulsión entre imanes de Neodimo.
      https://www.youtube.com/watch?v=WJXvnlfjQ-k

   4. Experimento Parte V. Experimento de repulsión entre imanes de Neodimio.
      https://www.youtube.com/watch?v=Y9oYiVDvL9Q

   5. Experimento Parte VI. Experimento de repulsión entre imanes de Neodimio.
      https://www.youtube.com/watch?v=lf58CKpuzdg

   6. Experimento Parte VII. Experimento de repulsión entre imanes de Neodimio.

7. https://www.youtube.com/watch?v=ejiuv1r5egM

8. Experimento repulsión diferente balanza.Imanes de Neodimio.

https://www.youtube.com/watch?v=_ldw9C6aOaI

5 Results and interpretation of experiments with the two weighing scales.

5.1 Pros and cons of these home made experiments.

5.1.1 Cons of these home made experiments.

1) As shown in the photographs inserted in this article; and youtube videos; It is very evident the lack of full subjection magnet balance.

2) Lack of an automatism that go approaching the magnet inserted into the plastic box, so that there is perfect alignment between the two centers of the magnetic disks (with the same polarity on the facing surfaces). And the lack of fixed vertical stabilizing allow far more accurate final result (without swinging plastic magnet box).

3) That the approach is manual, involves measurements that vary in different samples, or performances of experiments.

5.1.2 Pros of these home made experiments.

1) The high power Neodymium magnets, supply the defects of stabilization. Although the approach of magnet box plastic, either manually.

2) We can observe gains; in the balances, very clear, fictitious mass; which they are not dependent on magnetic influence on the electronic elements of the balances.

3) Different measurement values of the fictitious mass depends only on the imaginary axis perpendicular alignment connecting the centers of the two magnetic disks, and the approach distance; without the magnet placed on the scale moves. These different values; which are correct, obey the hand pulse, which slowly approaches box plastic magnet, to the magnet Cd plastic box, placed above the balance.

With an automated system, both in the perpendicular alignment of the two magnets, as in the sujeccion of the magnet placed on the balances; be observed, fictitious gains equal mass; to the same vertical heights.

5.1.3 General numerical results fictitious gain mass, in grams, with two different balances.

With both types of weighing (two different balances). 1) the first counting the weight of the magnet system Cd box (undiscounted, then tare); fictitious

gravitational mass differences are obtained; ranging from - 127g-129g least 94 g Cd magnet = fictitious gravitational mass gain of 33g-35g. In the videos, gains gravitational mass ranging from 135 g-131 g less than 94 g Cd magnet = fictitious gravitational mass gain observed 35 g-41 g.

2) With the use of the second balance with plastic insulating support and discounting the weight of Cd box iman (tare zero) system; in photography inserted in this article, a gain of fictitious gravitational mass of 62 g it is observed.

5.1.4 Interpretation.

The same evidence of the results obtained with two different balances; It implies that the pressure of repulsion between the two powerful Neodymium magnets, produced a gain of fictitious gravitational mass; in measurements in the balances.

5.2 Equivalents of the experiments: the reverse Casimir effect (spherical shell) and the repulsion effect of macroscopic spherical shell of the observable Universe. Equivalences between the cosmological constant and the repulsive energy of the quantum vacuum.

5.2.1 Opposite Casimir effect: 1) Model spherical shell. Boyer T.H, and other physicists.

By results already achieved in some of our work; the neutrality of the quantum vacuum to the virtual electrical charges; It is due to the unification of gravity and electromagnetism by the fundamental equation, in which the partition function obtained by the nontrivial zeros of the Riemann zeta function plays an essential role. This equation is as follows (see the relevant articles):

$$4\pi^2 \cdot (\pm e)^2 \cdot \left(\sum_{Z_n}^{\infty} \exp\left(-Z_n\right) \right)^2 = 4 \cdot m_{Pk} \cdot m_e \cdot G_N \quad (3)$$

$\pm e = quantized\, electric\, charge = 1.6021765656 \cdot 10^{-19} C$
$m_{Pk} = Planck\, mass = \sqrt{\frac{\hbar c}{G_N}}$
$m_e = electron\, mass = 9.10938921 \cdot 10^{-31} Kg$
$G_N = 6.67384 \cdot 10^{-11} N \cdot m^2/Kg^2 = universal\, gravitational\, constant$
$Z_n = imaginary\, part\, of\, the\, nontrivial\, zeros\, of\, the\, Riemann\, zeta\, function$
$\zeta(s) = 0\ ;\ s = \frac{1}{2} + i \cdot Z_n$

Articles on request:

1) The zeros of Riemann's Function And Its Fundamental Role In Quantum Mechanics

2) Y Dios,También Está en la Ciencia Part I

3) Y Dios,También Está en la Ciencia Part II

Equation (3) can be written as a zero energy:

$$4\pi^2 \cdot (\pm e)^2 \cdot \left(\sum_{Z_n}^{\infty} \exp\left(-Z_n\right) \right)^2 - 4 \cdot m_{Pk} \cdot m_e \cdot G_N = 0 \ (4)$$

Equation (4) it can be interpreted as a zero energy; and therefore equivalent to an annihilation of a particle-antiparticle pair.

For there to be a finite value; not zero; will be necessary, then there is a matter antimatter asymmetry, also at the level of virtual particles, and therefore the quantum vacuum itself

As we have shown in previous work, matter-antimatter asymmetry can be computed as a function dependent; of total vacuum pairs (R8 lattice, 240 non-zero roots of E8 group. Octonions); the inverse of the fine structure constant (zero momentum), and the amount of electron positron pairs, or microstates. Equal to the sum of quantum wave curvatures, or circular strings (natural logarithm ratio Planck mass, electron mass, in this case). At the same time; these sums of quantum curvatures circular wave-strings are also the sums of probabilities; since it is true:

$$\sum_p \frac{1}{p} = \int \frac{dp}{p} = \ln(p) + C \ (5)$$

Making change, p, by the uncertainty radius of string and/or mass.Consult previous works.

$$\sum_{p(+)} \frac{1}{p(+)} + \sum_{p(-)} \frac{1}{p(-)} = \ln[p(+)] + \ln[p(-)] = 2 \cdot \ln(p) \rightarrow \cdots \equiv$$

$$n(pairs\ electron\ positron) = 2 \cdot \ln\left(m_{PK}/m_e\right) \ (6) \ ; \ p(+) \equiv matter \ ; \ p(-) \equiv antimatter$$

5.2.2 Asymmetry factor calculation; matter antimatter.

$n(b) = number\ of\ barions \quad ; \quad n(\bar{b}) = number\ of\ antibarions$

$$\Omega_b = \frac{n(b) - n(\bar{b})}{n(b)} = \frac{\left[2 \cdot \ln\left(m_{PK}/m_e\right) + \alpha^{-1}(0)\right] - 240}{2} = 0.045874149734999 \ (7)$$

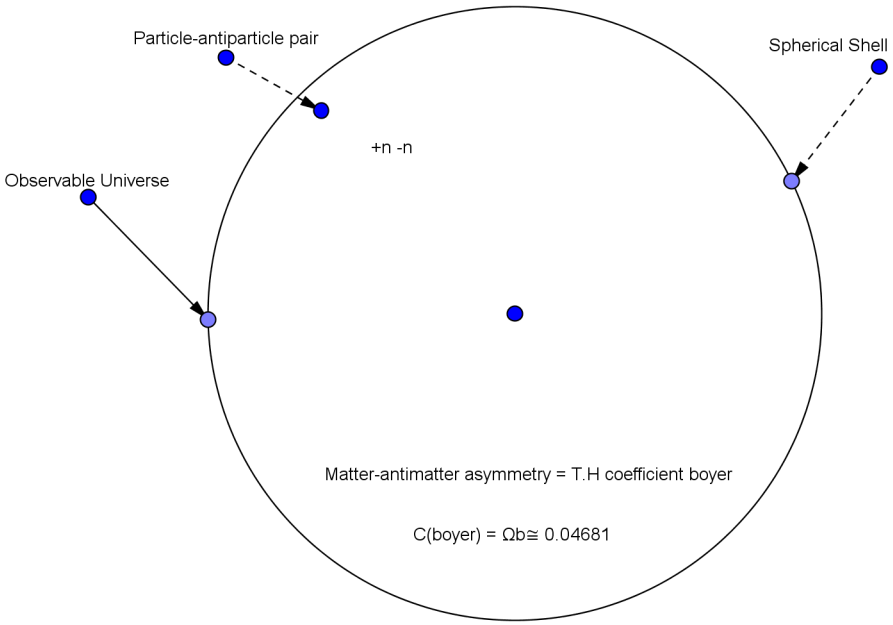
$$\alpha^{-1}(0) = 137.035999173$$

5.2.3 Equivalence factor calculation T.H Boyer and matter antimatter asymmetry factor.

Being; the observable Universe, equivalent to a huge spherical shell; in which there is the quantum vacuum of virtual particles; more matter-energy of the universe; then there must be a repulsion; and therefore a repulsive acceleration. In previous work it has already been shown that this repulsive acceleration is exactly the product of the speed of light in vacuum, multiplied by the hubble constant.

The amount of fermionic baryons or baryon density has to be almost equal, so, to the factor obtained by the complex calculation of regularization of infinite, performed masterfully by T.H Boyer.

Recall that the fermions, involve repulsion for calculating the energies of the quantum vacuum zero point. Conversely; bosons, involving forces of attraction.



$a_r = repulsive\ acceleration = c \cdot H_0$

$$C_{boyer} = +0.04681 \cong \Omega_b = 0.045874149734999 \ (8)$$

$$\triangle E_{Sp}(r) \cong +\Omega_b \cdot \frac{\hbar \cdot c}{r} \equiv \triangle E_{Sp}(r) \cong +C_{boyer} \cdot \frac{\hbar \cdot c}{r} \ (9)$$

5.2.4 The energy of the vacuum: function of the partition function of the nontrivial zeros of the Riemann zeta function, the coupling of Higgs vacuum (ratio Planck energy / Higgs vacuum energy), the 240 pairs of vacuum, the coefficient of TH Boyera and the vacuum energy density .The radius shall be that of observable Universe: c / H

Although the vacuum energy can be calculated in various ways; in this case the equation (3), which unifies electromagnetism and gravity by the partition function of the nontrivial zeros of the Riemann zeta function is used. Must be added the Higgs vacuum coupling with maximum energy term; It ie the Planck energy. With two coficientes: T.H coefficient Boyer, and 240 non-zero roots of E8 group representing R8 lattice for the quantization of vacuum pairs.

By equation (3) or (4):

$$4\pi^2{\cdot}(\pm e)^2{\cdot}\left(\sum_{Z_n}^{\infty}\exp\left(-Z_n\right)\right)^2 = 4{\cdot}m_{Pk}{\cdot}m_e{\cdot}G_N \rightarrow \frac{4\cdot m_{Pk}\cdot m_e\cdot G_N}{4\pi^2\cdot(\pm e)^2} = \left(\sum_{Z_n}^{\infty}\exp\left(-Z_n\right)\right)^2$$

$$\left(\sum_{Z_n}^{\infty}\exp\left(-Z_n\right)\right) = (1374617.4545188)^{-1}$$

Coupling Planck energy, vacuum Higgs energy :

$$\frac{E_{PK}}{E_{VH}}\ ;\ E_{PK}(GeV) = 1.2209322789090701{\cdot}10^{19}GeV\ ;\ E_{VH} = 246.219650867759\ GeV$$

Radio observable Universe:

$$R_U = \frac{c}{H_0}\ ;\ H_0 = 2.30547615889492\cdot 10^{-18}s^{-1}$$

$$\Omega_\Lambda = 1 - \frac{1}{\pi}$$

Finally, the vacuum energy of the spherical shell, the observable universe will:

$$\triangle E_{Sp}(R_U) \cong +0.04681\cdot\frac{\hbar\cdot c\cdot 240\cdot\left(\frac{E_{PK}}{E_{VH}}\right)}{\Omega_\Lambda\cdot R_U\cdot\left(\sum_{Z_n}^{\infty}\exp\left(-Z_n\right)\right)^2} \cong E_{Vacuum}\ (10)$$

$$E_{Vacuum} \approx 2.34326765567304 \cdot 10^{-3} eV$$

The result obtained for the vacuum energy perfectly matches on experimental value and that obtained in our previous works.

This same value of vacuum can be obtained by a direct function of the repulsive acceleration, which in this article mentioned, and which can be found in our articles:

2) Y Dios,También Está en la Ciencia Part I

3) Y Dios,También Está en la Ciencia Part II

Conclusions.

Repulsion experiments, performed with Neodymium magnets are a useful and macroscopic equivalents to the reality of the value of the vacuum model; obtained by adaptation of the conductive spherical shell model T.H Boyer for the spherical shell of the observable Universe. The first, and most important consequence: it does not exist, the so-called dark matter. This matter is fictitious and not real; effect of the pressure of the quantum vacuum repulsion. And as has already been shown in our works; this same repulsive acceleration of the quantum vacuum is the one that perfectly explains the anomaly of the rotation curves within galaxies.

References

[1] Timothy H. Boyer, Quantum Electromagnetic Zero-Point Energy of a Conducting Spherical Shell and the Casimir Model for a Charged Particle, Phys. Rev. 174, 1764 – Published 25 October 1968

[2] Kimball A Milton, E K Abalo, Prachi Parashar and Nima Pourtolami, Repulsive Casimir and Casimir-Polder Forces, http://arxiv.org/abs/1202.6415v2, 25 Apr 2012