W boson?

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Abstract. The beta decay β^- is the second grand Cosmic event of the Universe and is interpreted by the increased cohesive pressure, by the electric entity of the macroscopically neutral neutron and by the inductive-inertial phenomenon. It is a new interpretation of E/M and weak nuclear forces. Their integration with the strong nuclear and gravitational force is achieved with the unified field of the dynamic space, which is identical with the Higgs field, while the homonymous boson is located in the core of the particles and in black holes as space holes after the collapse of the stellar matter. The unconfirmed results (found from the team of the Fermilab Accelerator), that the W boson is more massive, suggest deviations from the Standard Model and come possibly as a result of an as yet undiscovered fifth force of Nature, are no longer needed to be interpreted or justified.

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1. Structure of the Neutron

Throughout the Universe there is an equality (Universal symmetry) of peripheral and radial forces.[1,2] This equality does not apply in the area close to the Universe center (breaking of Universal symmetry), where the curvature of space‡ is great and on the dynamic space of Universe is defined as

$$K_x = \frac{L_{0x}}{x} = \omega_x, \tag{1}$$

where L_{0x} is the elementary length of the units[3] electric dipole and ω_x is the central angle by which the edge L_{0x} is observed at a distance x from the Universe center.

‡ In Mathematics the curvature is defined as an abstract geometric concept $K = 1/R$. Here, the numerator is replaced with the actual unit of Nature, namely the electric dipole length[3] L_{0x}.

So, close to the Universe center the local cohesive pressure of space[4]

$$P_{0x} = P_{0p}\frac{x^2}{R_0^2} \tag{2}$$

causes the distortion of the cells, which evolve into the formation of vacuum bubbles, where P_{0p} is the cohesive pressure at the Universe periphery of a constant radius R_0.

This is the beginning of the Genesis of the particle-neutron, the primary form of matter, which is the first grand Cosmic event of the Universe as its opposite phenomenon. It creates a spherical formation of empty space (without units). The attractive pressure by the bubble formation is balanced by the cohesive pressure of space (Fig. 1).

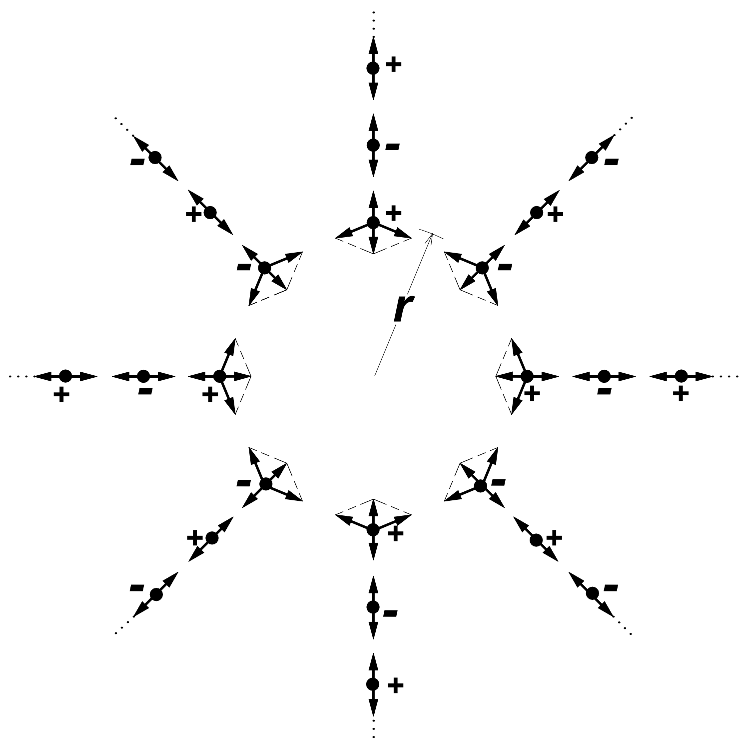

Figure 1. Indicative presentation of the bubble spherical formation ($F_0 = 4\pi r^2 P_0$, where F_0 the gravitational force of bubble,[1,2] P_0 the local cohesive pressure of space, $4\pi r^2$ the surface area of bubble and r its radius)

The creation of matter was initiated by the Genesis of the primary neutron close to the Universe center in the form of a space hole (bubble of empty space), which resists to the weak attraction of space cohesive pressure prevailing over there. Under the influence of the Universal antigravity force[5] the bubble acquires centrifugal accelerated motion towards the Universe periphery. So, it gradually crosses areas of increasing cohesive pressure, because of which the edge tensions of the cells and their distortions on the elastic surface of the bubble are increasing.

As the area around the bubble is distorted, a crush into its elastic surface and distension outwards is caused. This crush and distension on the area around the bubble changes locally the cohesive pressure, resulting in the outflow of negative units outwardly, mitigating the strong attractive forces of distension, after a decrease the pairs of negative and positive units. The outflow of these negative units outwardly is caused by the dynamic space due to the inertial phenomenon (see section 3), as a reaction to the geometric deformation of the neutron cortex,[6] according to the fundamental principle of antithesis[1,2] (opposition). So, a balanced allocation of the tensions on the inner and outer surface of the neutron cortex follows, rendering it resistant to the attraction of the cohesive pressure. Outflow, however, can happen with the positive units too, by producing the antineutron, which has opposite magnetic dipole moment.

2. Electrical charging of the particles cortex - Quarks

The structure of the neutron cortex[6] interconnects the particle spherical structure with the cubic one of ambient space,[1,2] resulting in condensation of the units in the inner cortex region.

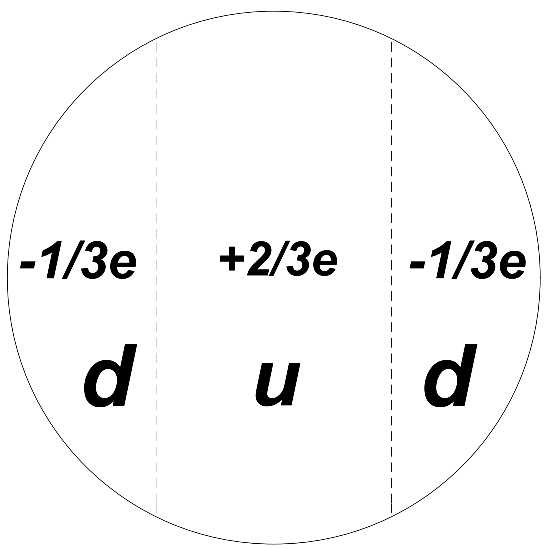

Figure 2. The surface electrical charges of the neutron cortex are its quarks

The elision of the negative units and their motion towards the cortex periphery repulsed them as homonymous to the centers of two opposite seats of the initial cube. The result is the appearance of two negative poles on opposite spherical regions of the cortex (Fig. 2), in the place of two opposite seats of the initial cube, while the surplus of positive units is condensed on its remaining four seats constituting the positive zone of the cortex. These electrically charged regions of the cortex are the particle's quarks.

Now, it can be calculated the electrical charge q_n of neutron, the magnetic dipole moment of which is[7]

$$\mu = -1,913\mu_n, \tag{3}$$

wherein μ_n is the unit of nuclear magneton. Respectively, the magnetic dipole moment of the proton with electrical charge $e = +1,6 \cdot 10^{-19}$Cb is[7]

$$\mu' = +2,792\mu_n. \tag{4}$$

These magnetic moments μ and μ' must be proportional to the electrical charges q_n (neutron) and e (proton), that is

$$\frac{q_n}{e} = \frac{\mu}{\mu'} = \frac{-1,913\mu_n}{2,792\mu_n} \Rightarrow q_n = -0,685e, \tag{5}$$

which equals to the electrical charge of the two negative poles (d quarks) of the neutron cortex. So, the neutron quarks are the two d quarks ($-e/3$ each) and the intermediate u quark ($+2e/3$). Therefore, the total charge of the neutron is

$$-\frac{e}{3} + \frac{2e}{3} - \frac{e}{3} = 0. \tag{6}$$

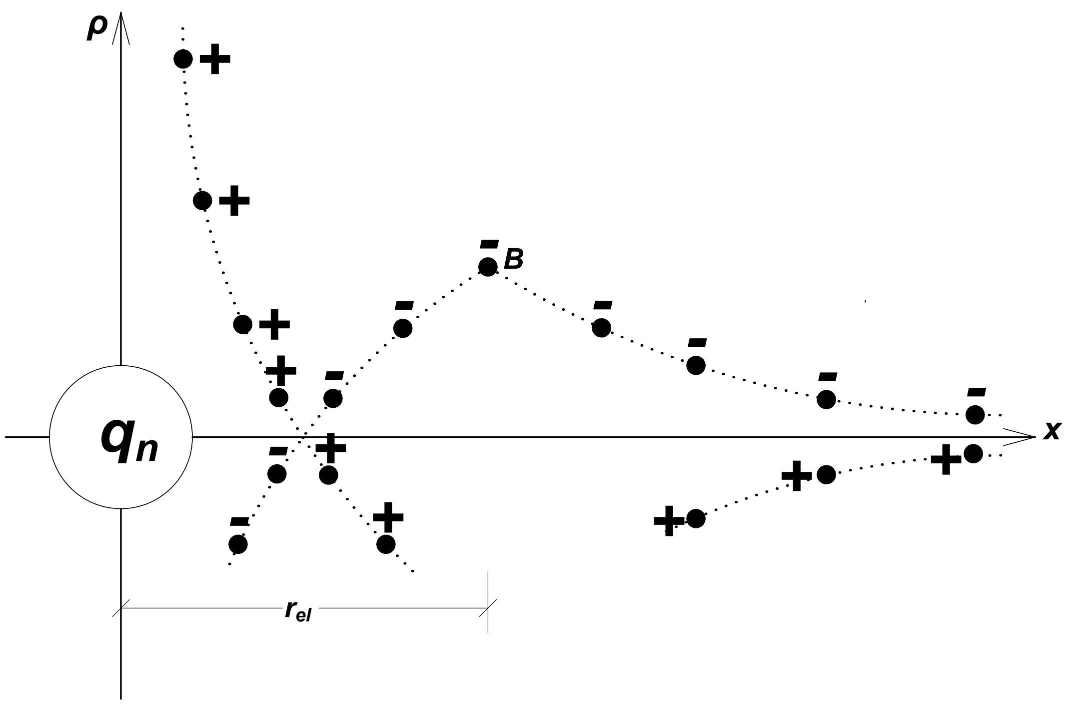

Figure 3. Internal electric field of the calculated negative electric charge $q_n = -0,685e$ of neutron with its cloud of positive electrical units and external electric field with its negative electrical units

So, macroscopically, the neutron is an electrically neutral particle. However, on the scale of the nucleus, the neutron behaves as a negatively charged particle and so its magnetic dipole moment is interpreted. The above negative charge $q_n = -0,685e$ (Eq. 5) creates induction close to the nucleus region and inverse electric field[8] (Fig. 3) of positive potential as a cloud of positive electrical units, affecting the nucleus field and the cohesive pressure of proximal space, forming the architectural structure of the nuclei.[9]

3. Inductive-inertial phenomenon

In a changing motion of an electric charge (for example electron) a shift of electric units of the proximal space is caused and a difference ΔP[10] of space cohesive pressure is created (see section 4).

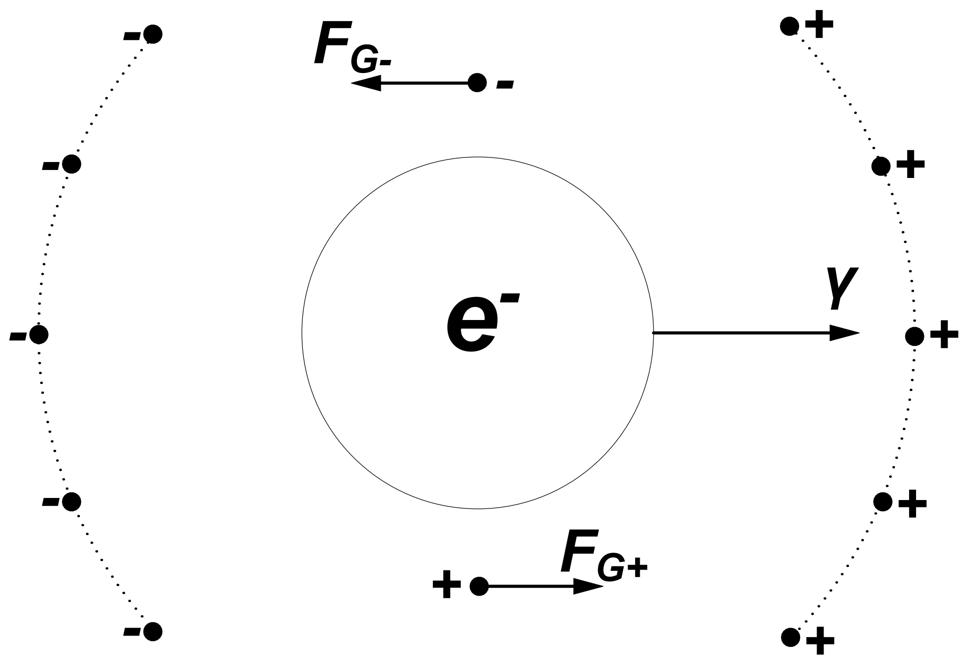

Figure 4. Inductive phenomenon and its inductive-inertial forces F_{G+} and F_{G-}

This shift of units at a proximal area of an electron is the inductive-inertial phenomenon and the forces F_G are the cause that moves these units. The inductive force F_{G+}, when is applied on the positive units, has the same direction with the acceleration γ of the electron, while if the F_{G-} applied on the negative units, it has the opposite direction to γ (Fig. 4). The inductive-inertial phenomenon takes place, when an external force (for example by a positive charge) is applied on an electron, due to which it reacts, hindering the change of its kinetics by sending positive units in front and negative units behind.

The inductive-inertial phenomenon is another expression of the antithesis (opposition) principle[1,2] and the cause is the acceleration of the electron. Therefore, due to the principle of antithesis, the electron reacts to the change of its kinetics and tries to hinder the approach of the positive charge by which it is attracted, by placing positive units in front and negative ones behind. Like in uncharged particles, inertia is the reaction mechanism to the change of its kinetics, the same occurs in charged particles that the corresponding reaction mechanism to this change is the inductive phenomenon.

4. Dynamics of inductive-inertial phenomenon

In front of the uniformly moving ($\gamma = 0$) electron (right in Fig. 5), a positive unit of its electric field is balanced. However, the accelerated electron leaves (due to acceleration

γ) a part of the electric attraction that acts on the positive unit, proportionally to force F_{G+}, by which the unit is moving to the right at the same direction with acceleration γ.

A similar dynamic analysis of the phenomenon can be done for a negative unit in front of the electron (right in Fig. 5), since the accelerated electron leaves a part of the electric repulsion that acts on the negative unit, proportionally to force F_{G-}, by which the unit is moving to the left at the opposite direction to acceleration γ.

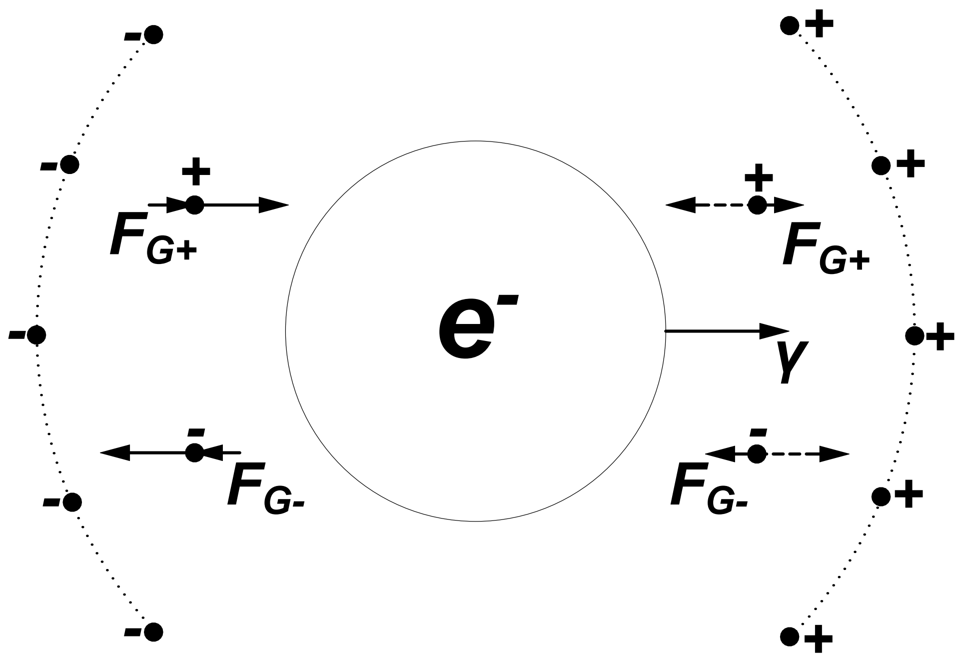

Figure 5. Dynamics of inductive phenomenon (the electron acceleration imposes a loosening of electric attraction and repulsion in front and a strengthening of them behind)

Also, the same dynamic analysis can be done behind the electron (left in Fig. 5), but here the electric attraction and repulsion on the positive and negative units are strengthened, due to the electron acceleration γ, resulting the positive units to move to the right and the negative ones to the left in Fig. 5.

This loosening of the electric attraction and repulsion of the units in front is created, due to the thickening of them (inertial phenomenon-geometric deformation), imposed by the electron acceleration γ, resulting in the reduction of dipole forces[3]

$$F = kL_0. \tag{7}$$

The opposite happens behind the electron, where the strengthening of the electric attraction and repulsion is created due to the dilution of units, imposed by the electron acceleration γ, thus increasing the dipole forces $F = kL_0$ (Eq. 7).

This tends to increase the cohesive pressure of space behind the electron and reduce it in front of it. However, the dynamic space[1,2] reacts to this change with the inductive phenomenon, reversing the phenomenon (principle of antithesis). This is achieved by placing positive units in front and negative ones behind (electric or quantitative deformation, inductive phenomenon), forming the grouping units, thus increasing the cohesive pressure in front of and reducing it behind the electron, since in front the positive units added to the negative ones of the electron's field, increasing the pairs of oppositely charged units and, consequently, the cohesive pressure of space. The opposite happens behind the electron, wherein the negative units of electron's field are increasing, due to the negative grouping units of the inductive phenomenon, decreasing the pairs of oppositely charged units, resulting to reduce of the space cohesive pressure.

Therefore, in this geometric deformation the dynamic space reacts with the inductive phenomenon and imposes an electric or quantitative deformation of the space in front of and behind the electron, installing a pressure difference ΔP as a motion arrow of the electron. This is the extremely fine texture of motion.[10]

5. Magnetic forces

The achieved pressure difference ΔP (see section 4), in front of and behind the electron, is the cause of the accumulated forces[10] on the electron spherical zone. Of course, during the electron deceleration, a discharge of grouping units happens and therefore a reduction of pressure difference ΔP, by a discharge of forces at the spherical zone of electron.

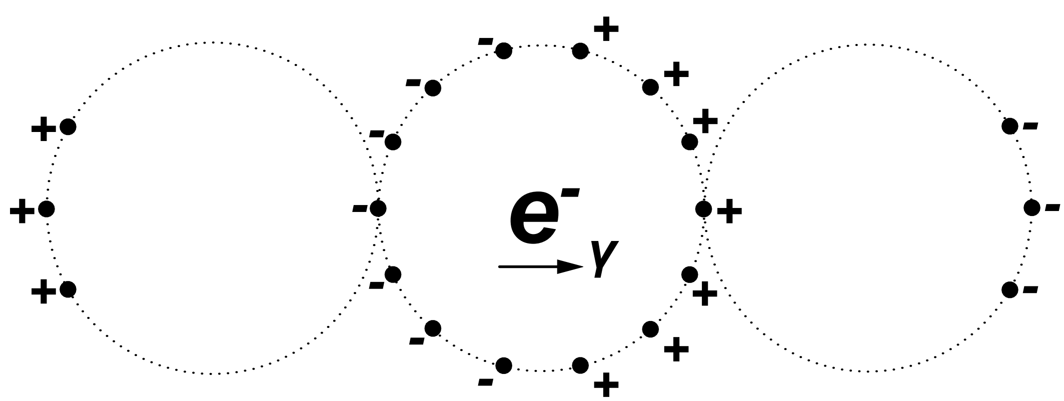

Figure 6. The first pair of extra grouping units

Therefore, acceleration γ of the electron creates the grouping units and its constant speed u maintains them, due to the principle of conservation of kinetic force or energy.

Also, this phenomenon occurs at the acceleration of the grouping units, resulting in the reproduction of new grouping units, called extra grouping units (Fig. 6). Thus, as the positive grouping units of electron are accelerated, they send in front negative extra grouping units of the same form, while no positive units are placed of them behind. Respectively, behind the electron the negative grouping units form positive extra grouping units, without negative ones in front of them. Additionally, other extra grouping units are created with a charge decreasing, resulting the harmonic fluctuation[11] of pressure difference ΔP by descending geometric sequence.

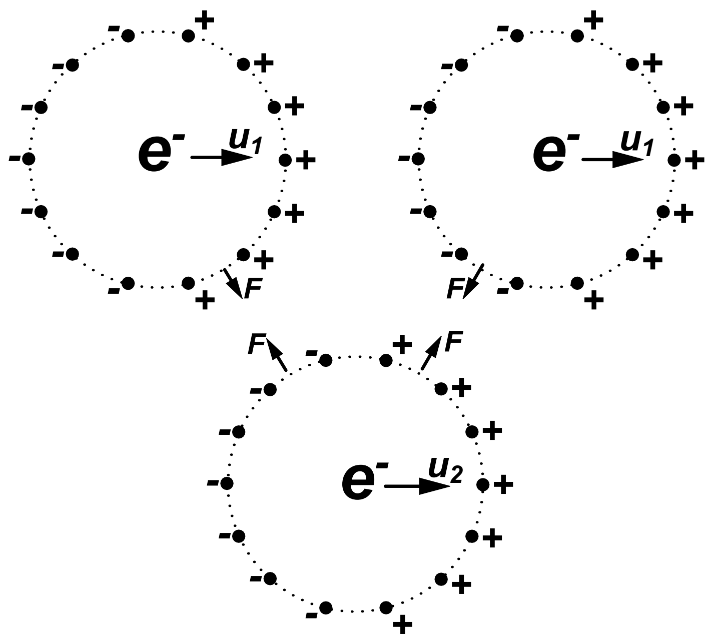

Figure 7. Attraction between electrons moving at the same direction

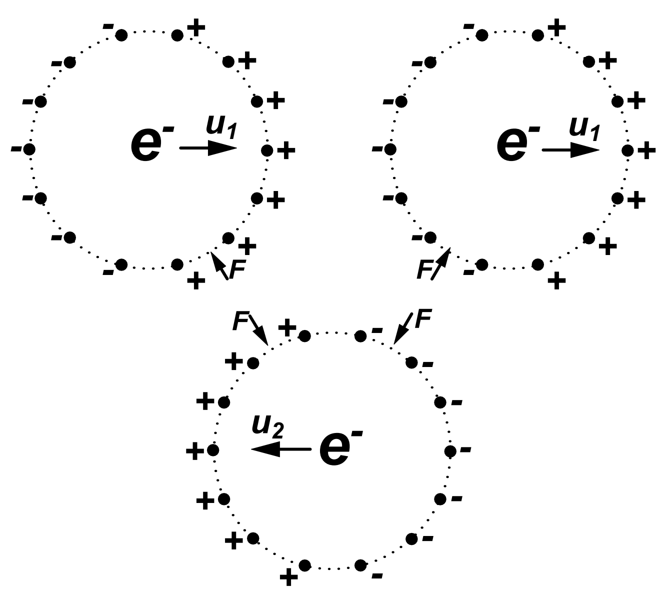

Figure 8. Repulsion between electrons moving at the opposite direction

The magnetic force between two parallel electric conductors is interpreted, by the fact that their electrons create grouping units during their motion as by the inductive phenomenon has been described.

For electrons moving at the same direction, the oppositely charged grouping units (at speeds u_1 and u_2 of the moving electrons) are always as in Fig. 7 and are attracted.

For electrons moving at the opposite direction, the homonymous grouping units (at speeds u_1 and u_2 of the moving electrons) are always as in Fig. 8 and are repelled.

Consequently, the inductive phenomenon is the cause for the creation of magnetic forces that occur as a result of attractive or repulsive Coulomb's electric forces between the grouping units of the moving electrons.

6. Beta decay β^-

The effect of the Universal antigravity force[5] causes on the neutron a centrifugal accelerated motion towards areas of increasing cohesive pressure.

As the neutron accelerate towards areas of increasing cohesive pressure, then decays (beta β^-) into a proton, an electron and an antineutrino (Fig. 11)

$$n \longrightarrow p + e^- + \bar{\nu}. \tag{8}$$

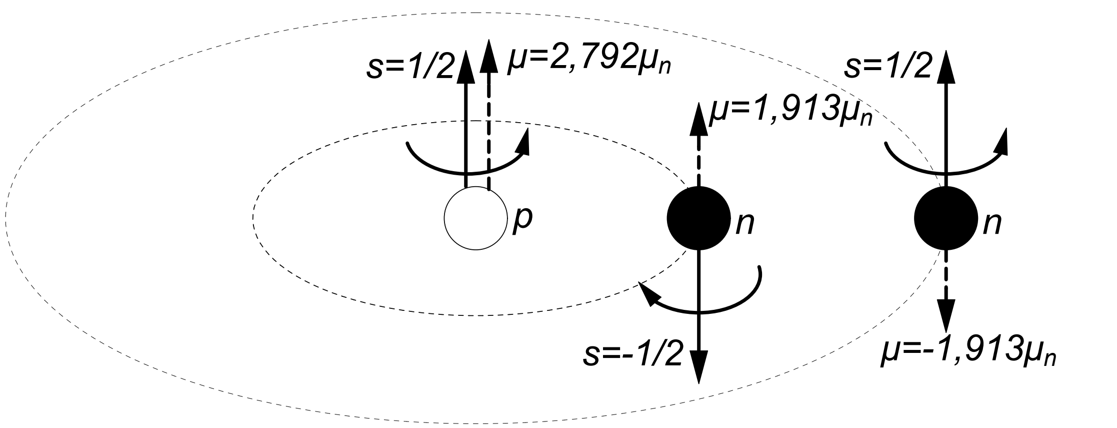

Figure 9. Structure model of tritium nucleus ${}^3_1H = p+n+n$ with the distant unstable neutron

However, the inverse electric field[8] of the nucleus (where the cohesive pressure is reduced) is considered to be the refuge of the neutron salvation. Despite the stability of neutrons in the nuclear negative field, a beta decay β^- can occur, when neutrons are at a reduced negative potential and hence at an increased cohesive pressure.

Specifically, the distant neutron of tritium[12] (Fig. 9)

$${}^3_1H = p + n + n \tag{9}$$

is less stable due to the very small negative potential and decays with a half-life of 2.5 years. Nevertheless, when tritium is a component of other nuclei, it becomes stable within the strong negative field of these nuclei.

It is reminded here the electric entity of the macroscopically neutral neutron. However, at the scale of the nucleus behaves as a positively charged particle due to the negative surface charge $q_n = -0,685e$ (Eq. 5), which create an inverse electric field of positive potential (internal field) as a cloud of positive electrical units (Fig. 3).

Hence, a beta decay β^- can occur due to the above electrical entity of neutrons and due to their synod (session) in the nucleus, with which the negativity of nucleus decreases due to the positive hill created by the neutrons' synod.

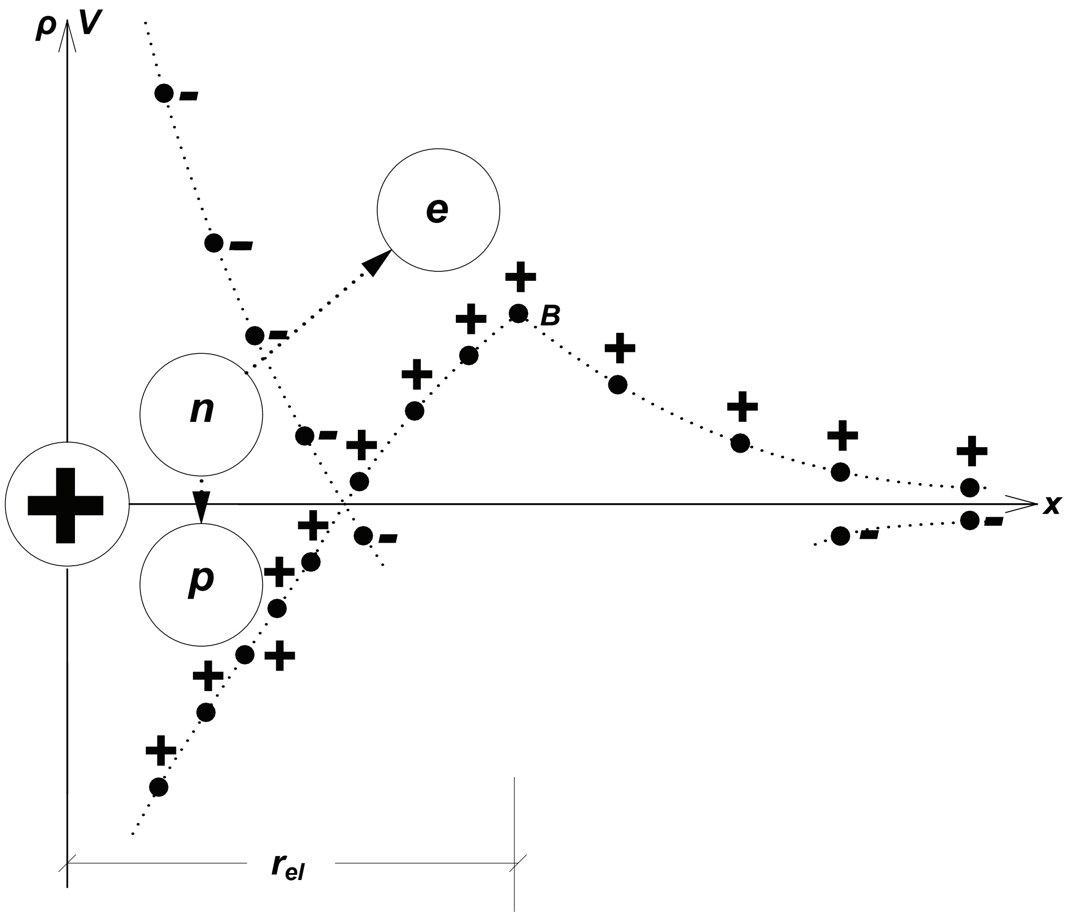

Figure 10. In the inverse nuclear field one synod's neutron decays to produce a proton, an electron and an antineutrino, where r_{el} is the electric radius and B the potential barrier

Then, one of the above synod's neutron decays to produce the proton, which increases the negativity of the nuclear field, saving the remaining synod's neutrons from decay. The produced proton of the beta decay β^- is immersed in the lower inverse nuclear field, while the electron will be repelled and exits the nucleus (Fig. 10).

Additionally, if the beta decay β^- occurred at the positive potential of the neutrons' synod, then the reduced potential of the nucleus would not be enough to repel the electron to pass the potential barrier[8] of the nucleus. In fact, at the time of maturation of the beta decay β^- (non-instantaneous) the neutrons' synod is dissolved, increasing the negative potential of the nucleus, which is enough to repel the electron with sufficient kinetic energy to cross the potential barrier of nucleus.

But why does not radiate the electron leaving the nucleus? The very strong negative field of the electron tears the potential barrier of the nucleus without accelerating or decelerating (linear motion[10]) and does not radiate. Moreover, the linear motion of the electron is caused by the buoyancy condition (nuclear antigravity force[5]) created by the inverse nuclear field.

The produced proton of the beta decay β^- remains at the same potential of the nucleus without γ-radiation, or it sinks deeper into the negative nuclear field, emitting γ-radiation.

7. Neutrinos as independent E/M formations of one spindle

By the unified theory of dynamic space,[1,2] the inductive-inertial phenomenon (see sections 3 and 4) is developed, which is a precondition to create E/M waves,[13] while the cause for creation of E/M formations is the phenomenon of rotary oscillations[13] of the electron.

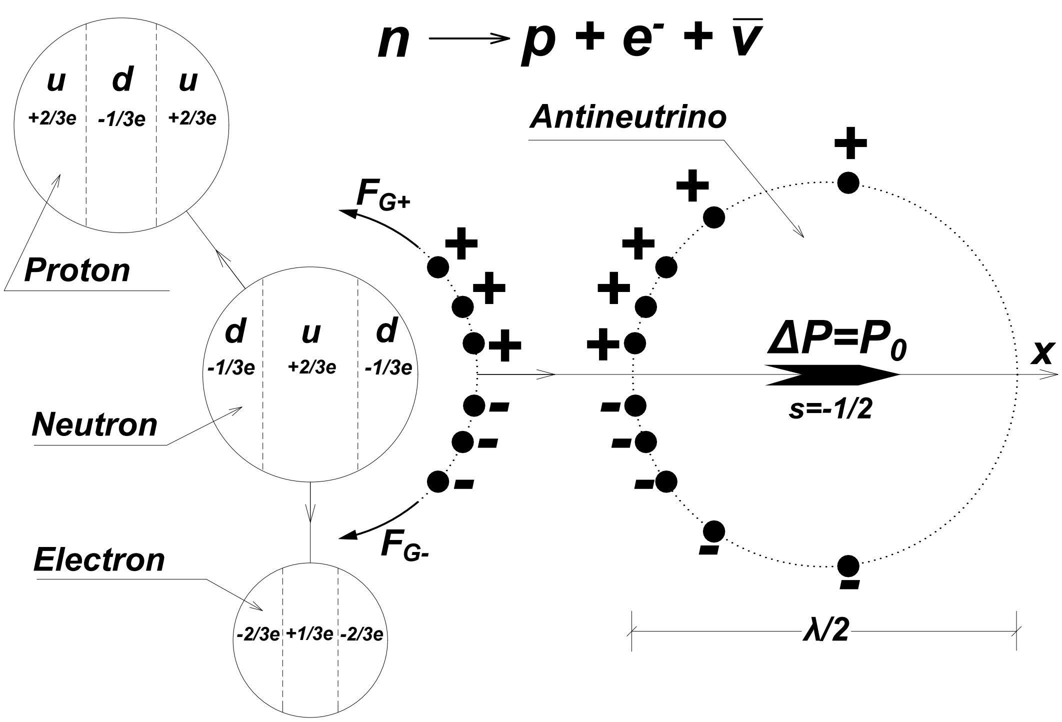

Figure 11. The beta decay β^- creates the grouping units of antineutrinos at the contact limits of the neutron quarks, formed (as schematically is designed) by the inductive forces F_{G+} and F_{G-} (see sections 3 and 4)

The E/M spectrum has, as known, a maximum frequency $\nu = 10^{24}$Hz. The dynamic space can give E/M radiation of even greater frequency, but not by oscillation or by changing the kinetics of the electron, which has a significant inertial mass that prevents larger accelerations. Therefore, the formations of neutrinos cannot be photons or independent E/M waves.[14] Hence, there remains the search of strongly accelerated electric charges with minimal inertia, such as the charges of the particles, consisting of units[3] with zero inertial mass. Consequently, the creation of neutrinos is located at the strongly accelerated motions of the units, which happen in the cortex[6] of the particles.

So, the emission of antineutrinos is interpreted by the inductive phenomenon (see sections 3 and 4) as independent E/M formations,[14] which are created when a neutron breaks down into a proton and an electron (beta decay β^-).

Specifically, when a neutron breaks down into a proton and an electron, then at the contact limits of the neutron quarks (see section 2) the adjacent opposite units are strongly accelerated, causing grouping units (inductive phenomenon) outside the neutron cortex as a full spindle of E/M formation (Fig. 11).

Therefore, the antineutrino is similar to an independent E/M formation of one spindle with a wavelength $\lambda/2$ and a spin[15] $s = -1/2$ or $s = +1/2$ for the neutrino.

8. Frequency of neutrinos

The energy E_n of the neutron before the breakdown will be

$$E_n = E_p + E_e + E_{\bar{\nu}}, \tag{10}$$

where the second part of Eq. 10 are the energies (after the decay) of proton, electron and antineutrino. However, $E_p = 938,28\text{MeV}$[7] is the rest energy of proton, assumed to be approximately equal to the energy kinetics after the decay and $E_n = 939,57\text{MeV}$[7] is the rest energy of neutron. So, their energy difference is $E_n - E_p = 1,29\text{MeV}$ and the Eq. 10 becomes

$$E_e + E_{\bar{\nu}} = E_n - E_p = 1,29MeV = 2 \cdot 10^{-13}J. \tag{11}$$

However, because the energies of the electron and antineutrino are approximately equal ($E_e \approx E_{\bar{\nu}}$), then the energy of antineutrino, due to Eq. 11, is

$$E_e \approx E_{\bar{\nu}} = 10^{-13}J \Rightarrow E_{\bar{\nu}} = 10^{-13}J. \tag{12}$$

We assume a train of independent E/M waves has energy $E_{\bar{\nu}} = 10^{-13}\text{Joule}$ (Eq. 12), then their frequency will be

$$\nu = \frac{E_{\bar{\nu}}}{h} = \frac{10^{-13}}{6,6 \cdot 10^{-34}} = 0,15 \cdot 10^{21}Hz \Rightarrow \nu = 0,15 \cdot 10^{21}Hz. \tag{13}$$

The number of fundamental E/M waves the above train is then

$$\kappa = \frac{\nu}{\nu_\tau}, \tag{14}$$

where

$$\nu_\tau = 10^5 Hz \tag{15}$$

is the frequency[13] of the fundamental E/M wave (Fig. 12). So, the Eq. 14, due to Eqs 13 and 15, becomes

$$\kappa = \frac{\nu}{\nu_\tau} = \frac{0,15 \cdot 10^{21}}{10^5} = 15 \cdot 10^{14} \Rightarrow \kappa = 15 \cdot 10^{14}. \quad (16)$$

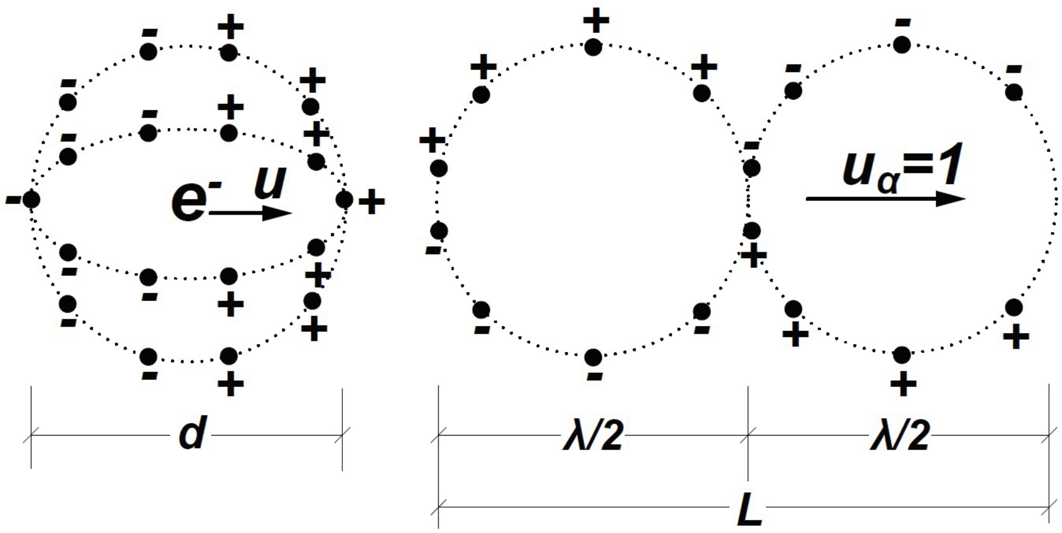

Figure 12. Correlation of a meridians pair with a fundamental E/M wave ($d = \lambda/2$, $\lambda = L$ the photon length and $u_a = 1$ the constant timeless speed[16] of light)

However, the number of spindle-antineutrinos corresponding to the wavelength of this frequency is twice ($\kappa' = 2\kappa$) of this number of E/M waves of the supposed train, that is

$$\kappa' = 2\kappa = 2 \cdot 15 \cdot 10^{14} = 30 \cdot 10^{14} \Rightarrow \kappa' = 30 \cdot 10^{14}. \quad (17)$$

Therefore, the frequency of antineutrinos will be found as the product of the number of spindle-antineutrinos $\kappa' = 30 \cdot 10^{14}$ (Eq. 17) times the frequency $\nu = 0,15 \cdot 10^{21}$Hz (Eq. 13) of the supposed train of independent E/M waves, namely it is

$$f = \kappa' \nu = 30 \cdot 10^{14} \cdot 0,15 \cdot 10^{21} = 45 \cdot 10^{34} Hz \Rightarrow f = 45 \cdot 10^{34} Hz. \quad (18)$$

Frequency $f \approx 10^{35}$Hz of neutrinos-antineutrinos is impressively large.

9. Epilogue

The new interpretation of E/M and weak nuclear forces and their integration with the strong nuclear and gravitational force is achieved with the unified field of the dynamic space, which is identical with the Higgs field,[2] while the homonymous boson is located in the particles core and in black holes as space holes (bubbles of empty space), after the collapse of the stellar matter.

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