

A New Subquantum Causal Physics on The Fundamental Phenomena. A New Research Method in Educational Science (rev.1)

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ABSTRACT: This article presents the results of applying the research method called „Soft Natural Research on the Subquantum Environment” that allowed the author, in the period 1970-1990, to discover and explain, versus 63 original digital equations, the fundamental physical effects and phenomena, originating in the Unknown (hidden) Part of Nature, such as the following discoveries: the Universal Subquantum Fluid together with the two subquantum particles; Pulsating Kinetic Clusters of the Elementary Particles; Radiant Clusters around the Electrons; the two particles in the Proton structure, as well the causal explanation about: the gravity attraction, inertia and mass essence; natural relativity effects; nature of electricity and electrical neutrality; nuclear forces versus Quantum Gravity; essence of natural radioactivity; optical and electrical superconductivity; extracting energy from the Universal Subquantum Fluid.

Keywords: *research method; subquantum dual fluid; cuantom; proneutron; kinetic clusters, quantum gravity. extracting energy from subquantum Fluid.*

1. INTRODUCTION

The Physics of the Subquantum Environment is a field of research approached within the Institute for Research and Technological Design in Telecommunications of Bucharest, starting from 1971, with the aim of identifying the hidden physical entities which cause excessive attenuation of 20 dB/km on an optical signal with wavelength $\lambda = 633$ nm, transmitted by laser in optical fibres with diameter $D_{FO} = 62.5$ μm (US Pat. no. 3 711 262 called Optical Waveguide Fibers, 1970) [1].

The object of the research was essentially Interaction between the Photon Radiation transmitted in Optical Waveguide Fibres by the laser at the speed $c = 2.99792458 \times 10^8$ m/s, having the energy E_γ , and the Electrons of the Silicon Atom, with they interact in the optical fibre, given by the known equations:

$$E_\gamma = h f_\gamma = h.c/\lambda_\gamma = m_\gamma.c^2 \quad \text{J} \quad (1)$$

$$h = E_\gamma/f_\gamma = E_e/f_e = 6.6260700408 \times 10^{-34} \quad \text{J.s} \quad (2)$$

$$E_e = h.f_e = h.c/\lambda_e = m_e.c^2 = 8.18710565 \times 10^{-14} \quad \text{J} \quad (3)$$

where: h is the Planck's Constant [2]; f_γ and λ_γ are the frequency and wavelength of the Compton's Waves generated by the Photons in interaction with the Subquantum Environment (SqE);

$\lambda_e = 2.4263102367 \times 10^{-12}$ m and $f_e = c/\lambda_e = 12355890902 \times 10^{20} \text{ s}^{-1}$ are the length and frequency of Compton Waves generated by the Electrons having, the mass $m_e = 9.1093835611 \times 10^{-31}$ kg,

The interaction of Photons with matter were also researched in other fields of the physical sciences, before and after Max Planck, with results known as the Newton Prism, Hertz Photoelectric Effect, Magnus Effect, Rydberg Radiation Spectra of Chemical Elements, Sommerfeld's Fine Structures, Curie Radioactivity, Cavendish Photon's gravitational mass, Compton's Waves, L'Huillier's Attoseconds Physics, Glauber's Laser, and others.

In 1704, Isaac Newton, analyzing the phenomenon of light propagation, concluded that on the propagation of light there are two kinds of vibrations: some are corpuscular, belonging to particles and the others, belonging to material medium excited by the vibrations of light particles. Regarding gravitation He has concluded that the existence of a unobservable substance like a Fluid, that pushes the bodies towards each other due to the mutual shielding, respectively the lower energy density (i.e. pressure) between them, compared to the energy density in the opposite directions [3].

In 1853, Heinrich Gustav Magnus discovered the curvature of the trajectory of a body moving in a fluid, while simultaneously rotating around that trajectory [4], proving in advance that in reality the fundamental medium has the structure of a Dual Fluid in which Electrons move, performing both a spinoid motion around their own axis and curved trajectories around atomic nuclei, as has been experimentally observed.

In 1887, Heinrich Hertz, after the discovery of the external photoelectric effect, he concluded that „light is made up of very fine corpuscular structures” [5].

In 1889, Johannes Robert Rydberg discovered [6] that each atom of the chemical elements has a spectrum of radiation emitted and received without interruption, depending on the distance of the electrons from the nucleus of the atom, proving that atomic electrons are surrounded by Radiation Clusters in energy balance.

In 1898, Pierre Curie and Marie Skłodowska - Curie publishing the results of research on „Radioactivity” [7] have proved that in reality the nuclei of atoms in radioactive elements are surrounded by Photons of absorbed radiation, gravitationally bound in the radiation Clusters, which emit fewer Photon Radiations than those absorbed.

When the dimensions of the nuclei exceed the wavelength λ_{e+} of Positrons in Protons, heated by the imbalance of photon radiation, the electric force of repulsion appears between some peripheral Protons which are emitted as alpha radiation, reducing the dimensions of the nucleus, below value λ_{e+} . The cycle continues until the imbalance between the received and emitted photon radiation disappears, because at distances smaller than λ_{e+} there can be no repulsive forces without electrostatic waves.

In 1921, Henry Cavendish, after the discovery of the gravitational deviation of the light cosmic ray, by the Sun, equal to 0.875", he concluded that „light photons have gravitational mass [8].

In 1922, Arthur Compton discovered an effect of modification of the wavelengths of X-rays which were scattered over Electrons at an angle ψ , with $\Delta\lambda$ [9] concluding that Electrons generate kinetic waves having length $\lambda_e = \Delta\lambda/(1-\cos\psi)$. It was later that all elementary particles, including photons, permanently emit and receive specific Compton waves in interaction with the fundamental medium.

In 1923, Arnold Sommerfeld, researching the emission spectra of atoms from chemical elements [10], concluded that they are all formed by fine structures under form of the Kinetic Clusters whose kinetic velocity v_e is given by the product $(a \cdot c)$, proving that in reality the Sommerfeld constant is the refraction index between the SqE with kinetic speed c and the kinetic Clusters of the Elementary Particles with kinetic speed v_e .

In 1963, Roy J. Glauber publishing the results of research on Laser, has proved that in reality Electrons in atoms are surrounded by Photons of absorbed radiation, gravitationally bound in the radiative Clusters, which emit the respective Photons when the Electrons are successively accelerated in opposite direction [11], entraining in their movement also the clusters with Photons that leave them when the direction of acceleration is reversed.

In 2017, Anne L'Huillier published the research result on the Attosecond Physics, where the laser radiation with the wavelength equal to **1064 nm**, can be used to visualise electrons when they move between the energy levels of atoms [12].

The conclusions based on experiences of other eminent researchers informed us that the „Fundamental Subquantum Medium” is a Fluid populated with two particles, in which the effects of Gravity and Electricity are generated.

In 1928, Albert Einstein analysed the research results of Hertz, Planck, and Compton, concluded that real physics processes might be described only if both the corpuscular structures and the Compton's waves generated by the respective structures in the propagation medium are taken into account [13].

In 1954, David Bohm and Pierre Vigier observed the lack of causality of the standard model in the conventional physics, have proposed a new model of causal interpretation of the quantum theory based on the hypothesis of the existence of a „Fundamental Kinetic Medium”, [14].

In 1961, Louis de Broglie analysed Jean-Pierre Vigiér's theories about the existence of a fluid medium, concluded that all quantum particles are formed at their turn of other smaller particles that possess the spin motion, and are constantly accompanied by fundamental waves, generated by the vibration of those particles in the propagation fluid. [15].

In 1967, Isaac J. Friedman, Henry Kendall and Richard Taylor experimentally discovering the two components in the proton structure [16], one with a positive electric charge $e+$, with the size by order 10^{-15} m, and another electrically neutral with the size by order 10^{-18} m located inside the positive particle, proved that the

Proton is composed of two particles, the Positron and Proneutron, existing in the form of two cospheric structures populated with n_{e+} and n_{pn} Cuantoms.

In 1982, using the new research method, the elementary particle called the Cuantom was discovered, which populates the Universal Subquantum Fluid (USqF) and has composed all Elementary Particles, including Photons, in the entire Universe [17,18,19].

In 1991, Nicolae Victor Zamfir and Richard Francis Casten published the research results on the Low Energy Nuclear Spectra [20].

In 2015, Iohan Hansson observed many unsolved problems in the conventional theories (the particle masses contain more 18 free parameters, which cannot be calculated or predicted'), concluded that by solving 10 of those problems "may be seen as a roadmap for future important work," considering in addition that it is necessary to have „new unknown principles for the reconstruction of the entire complexity of matter' [21].

In 2015, Marius Aghirescu, published a different theory of his own, quoting the article no.19 mentioned as a reference in this article, for comparison [22].

2. EXPLAINING THE SOFT NATURAL RESEARCH'METHOD

To know the Fine Components of Photons, Electrons and the Subquantum environment, the research started from the structural equation of the Planck constant (2), since all energies in the Universe $E_i = h \cdot f_i$ have the Subquantum Components expressed by the constant h and the Quantum Components (Elementary Particles including Photons) expressed by the frequencies $f_i = c/\lambda_i$, respectively wavelengths $\lambda_i = c/f_i$, of the Waves generated by the elementary particles, including Photons, in interaction with the Fine Component of the Fundamental Environment according to the experimentally validated equations (1) and (2).

The equation (2) proves that the Subquantum Fine Structures' represented by the constant h can be qualitatively highlighted by the constant h , if the compound unit of measurement, **Joule** is decomposed into the primary natural units of measurement of energy, $kg \cdot (m/s)^2$, the equations (2) became:

$$h = m_e c^2 / f_e = m_e c \lambda_e = 6.6260700408 \times 10^{-34} \text{ kg} \cdot (m/s)^2 \cdot s \quad (4)$$

The new original soft research method is consisting in reanalysis of physical constants previously obtained experimentally by other brilliant researchers, using „primary natural units of measurement", i.e. the use **kg, m, s, rad**, instead of the composite units of measurement as **J, W, N, C, A, V, F, H, Ω** inapplicable in the Subquantum Environment.

3. THE SUBQUANTUM PARTICLES AND GRAVITY

The generation of Compton waves at frequency f_e proves that the electron is a pulsating kinetic cluster composed of n_e Cuantoms that continuously execute n_e cycles of absorbtion-emission Cuantoms per second ($n_e/s=f_e$), resulting in the energy h_e and mass m_e of the Cuantoms from the following digital equations:

$$n_e = (1s) \cdot f_e = m_e / m_c = 1.2355890902 \times 10^{20} \quad (5)$$

$$m_e = m_c / n_e = h_c / c^2 = 7.3724972 \times 10^{-51} \text{ kg} \quad (6)$$

$$h_e = m_e c^2 = 6.6260700408 \times 10^{-34} \text{ kg} \cdot (m/s)^2 \quad (7)$$

The energy and power of the Compton's waves emitted and received by the Electron were expressed by the following equations:

$$E_{ew} = n_e h_e = 8.18710565 \times 10^{-14} \text{ kg} \cdot (m/s)^2 \quad (8)$$

$$P_{ew} = h_e f_e = 8.18710565 \times 10^{-14} \text{ kg} \cdot (m/s)^2 / s \quad (9)$$

The simultaneous and permanent existence of gravitational and electrostatic interactions between Electrons, demonstrates that the Subquantum Universe has the structure like a Dual Universal Fluid composed of two open mutually interpenetrating kinetic media populated with both, the primary, indivisible particles called Gravitons and the Cuantoms, each being composed of n_e Gravitons bound together in a kinetic cluster, by the external kinetic pressure from free Gravitons at the kinetic speed c , each having the mass m_g and energy E_g .

The equations (8) demonstrated that Subquantum Fluid is populate with Cuantoms moving at the same kinetic speed c , having individual mass m_e and energy h_e .

When a free Cuantom collides with an Electron, its energy is distributed equally to the Cuantoms gravitationally bound to the Electron, though the „kinetic effect’.

The stability of the Electron is ensured if the gravitational binding energy, E_{gc} of each Cuantom is at least equal to the share of the energy received by the kinetic distribution:

$$E_{cd} = h_c/n_e = 5.36268092 \times 10^{-54} \text{ kg} \cdot (\text{m/s})^2 \quad (10)$$

through the „kinetic effect’.

The stability of the Cuantom inner Electron which received the distributed energy is ensured if the respective Cuantom emits a Graviton with energy (i.e. $E_{gc} = E_{cd} = E_g$), according to the following equations, where r_c is the Cuantom’s radius:

$$E_g = m_g c^2 = h_c/n_c = E_{gc} = E_{cd} \quad (11)$$

$$E_{gc} = E_{cd} = G \cdot m_c \cdot (n_c m_c / r_c) = h_c/n_e \quad (12)$$

$$n_c = n_e = 1.2355890902 \times 10^{20} \quad (13)$$

$$m_g = m_c/n_c = 5.966787226 \times 10^{-71} \text{ kg} \quad (14)$$

where by „Kinetic Effect’, is meant the equalization of the volumetric energy density in the entire space occupied by the Electron Cluster, at the cluster kinetic velocity; the Cuantom’s radius and Gravitation Universal Constant, resulted from the Subquantum Digital Equations:

$$r_c = G \cdot (n_c \cdot m_c)^2 / h_c = 8.3582155 \times 10^{-38} \text{ m} \quad (15)$$

$$G = h_c \cdot r_c / (n_c \cdot m_c)^2 = 6.6740831 \times 10^{-11} \text{ m}^3/\text{kg} \cdot \text{s}^2 \quad (16)$$

From the equation (12) resulted the Electron’s gravitational energy and the interaction between two Electrons placed at a reciprocal distance R, thus:

$$E_{ge} = n_e \cdot E_{gc} = G(n_e \cdot m_c)^2 / r_c = h_c \quad (17)$$

$$F_{g(e-e)} = (E_{ge}/r_c) \cdot (4\pi r_c^2 / 4\pi R^2) = G \cdot (n_e m_c)^2 / R^2 \quad (18)$$

resulting the gravitational interactions for two particles being composed of n_i and n_j Cuantoms:

$$F_{g(i-j)} = G \cdot n_i \cdot n_j \cdot m_c^2 / R^2 \quad (19)$$

The equation (19) proved that the gravitational interaction is realized only between Cuantoms in the Subquantum Level, since equation (1) is valid for all material structures in the Universe.

4. KINETIC CLUSTER OF THE ELECTRON

The equation for kinetic speed into the Kinetic Clusters of the Elementary Particles, Arnold Sommerfeld’s equation for the Fine Structure Constant [10], and Charles A. de Coulomb’s equation for the Electric Interaction Constant [23] where written in the following general forms:

$$v_c = \alpha c = 2\pi f_e r_e = 2\pi f_i r_i = 2.1876912627 \times 10^6 \text{ m} \cdot \text{rad/s} \quad (20)$$

$$\alpha = 2\pi f_e r_e / c = v_c / c = 2\pi r_i / \lambda_i = 7.2973525664 \times 10^{-3} \text{ rad} \quad (21)$$

$$e^2 / 4\pi \epsilon_0 = n_e m_c c^2 r_e = n_c h_c r_e = n_i h_c r_i = 2.3070775115 \times 10^{-28} \text{ kg} \cdot (\text{m/s})^2 \cdot \text{m} \quad (22)$$

where $r_e = v_c / 2\pi f_e = 2.8179403227 \times 10^{-15} \text{ m}$ is the measured size of the Electron, $e = 1.602176620 \times 10^{-19} \text{ C}$ is the measured elementary electric charge, $\epsilon_0 = 8.854187817 \times 10^{-12} \text{ F/m}$ is the Electric Constant.

Any free Cuantom absorbed by colliding with the Electron Cluster, going from the directional velocity c to the kinetic velocity v_c of the Cluster, conserve its directional energy difference in an additional spin motion around its own axis under the „Spin Clustering Effect’, so that all clustered Cuantoms continuously perform rotations around their own axis, generating the curvature of the trajectory around the Electron axis, under the Magnus Effect in the Dual Subquantum Fluid, forming a <virtual Kinetic Membrane> with the radius r_e presented in the equation (22).

When the Electron’s Kinetic Cluster receive one free intercepted Cuantom, in the Reception-Emission Cycle, its inner energy rise with the value of h_c , leading to an increase in pressure and radial dimension. When a

Cuantom is emited, its energy, pressure and sizes decrease, resulting „the Pulsating Effect’ of the Elementary Particle.

5. NATURAL RELATIVITY

The kinetic energy E_o of the Compton Waves emitted and received by an Elementary Particle’s Kinetic Cluster (EPKC) composed of n_o Cuantoms, without directional inertial moving in the relativistic referential of the Subquantum Universal Dual Fluid (SqUDF), is given by the equation:

$$E_o = n_o m_c c^2 \quad (23)$$

The directional inertial energy added during the acceleration the particle from 0 to v_r relavtivistic velocity into the SqE is given by the following equation, where Δn_{v_r} is the number of free cuantoms absorbed by the EPKC from the SqUDF:

$$\Delta E_{v_r} = (n_o + \Delta n_{v_r}) \cdot m_c v_r^2 / 2 = n_{v_r} m_c v_r^2 / 2 \quad (24)$$

The equation (24) take into account the fact that in reality all $n_{v_r} = n_o + \Delta n_{v_r}$ Cuantoms in the EPKC participate in the energy supplement coming from the speed v_r . The total energy and inertial mass equal to gravitational mass at speed v_r are given by the following equations [24,25]:

$$E_r = E_o + \Delta E_{v_r} = n_o m_c c^2 + n_{v_r} m_c v_r^2 / 2 = n_{v_r} m_c c^2 \quad (25)$$

$$n_{v_r} m_c = n_o m_c / (1 - v_r^2 / 2c^2) = n_o m_c k_r \quad (26)$$

where the „relativistic factor’ is given by the equation:

$$k_r = n_{v_r} m_c / n_o m_c = 1 / (1 - v_r^2 / 2c^2) \quad (27)$$

In SqUDF, a directional movement requires a kinetic pressure difference, respectively a force, i. e. an acceleration of Elementary Particles in the direction of the movement. For the directional velocity to reach the maximum relativistic velocity c , equal in value to the kinetic velocity, a variation of the Elementary Particles acceleration during the time Δt_r given by the following equation will be necessary:

$$\Delta a_r = (c - v_r) / \Delta t_r \quad (28)$$

The equations (26 and 28) explain the effects of natural relativity on the mass and velocity of the Elementary Particles.

For the speed $v_r = c$, the mass and the energy become double because $k_r = 2$.

The equation (28) explains why in the SUDF the kinetic speed c cannot be exceeded because the acceleration of the particle becomes **Zero**.

6. DUAL ELEMENTARY PARTICLE CALLED PROTON

In 1931, Carl Anderson discovered the Positron, as distinct particle in cosmic radiation [26], In 1967, Isaac J. Friedman, Henry Kendall, and Richard Taylor discovered two components in the Proton structure [16], one with a positive electric charge e , with the same size as the Electron by order $10^{-15} m$, and another electrically neutral with the size by order $10^{-18} m$ located inside the kinetic membrane of the positive particle, later called Proneutron, by the author of this paper.

The characteristics of the Proneutron, were calculated with the following equations, where

$$m_p = 1.672621898 \times 10^{-27} \text{ kg}; m_{pn} = m_p - m_e = 1.67171096 \times 10^{-27} \text{ kg};$$

$$n_{pn} = m_{pn} / m_c = 2.2674962283 \times 10^{23} \quad (29)$$

$$\lambda_{pn} = h / n_{pn} \cdot m_c \cdot c = 1,3221299 \times 10^{-15} \text{ m} \quad (30)$$

$$r_{pn} = \alpha \cdot \lambda_{pn} / 2\pi = 1.5355345334 \times 10^{-18} \text{ m} \quad (31)$$

$$E_{pn} = n_{pn} \cdot h \cdot c = 1.5024588826 \times 10^{-10} \text{ kg} \cdot (\text{m/s})^2 \quad (32)$$

All measurements proves that the structure of the equations (29,30,31 and 32) may be also generalized ($n_i = m_i / m_c$; $\lambda_i = h / n_i \cdot m_c \cdot c$; $r_i = \alpha \cdot \lambda_i / 2\pi$; $E_i = n_i \cdot h \cdot c = n_i \cdot m_c \cdot c^2$) for the Electron/Positron, Neutron, according to the following equations, where the Neutron’s mass $m_n = 1.674927471 \times 10^{-27} \text{ kg}$:

$$n_n = m_n / m_c = 2.27186908 \times 10^{23} \quad (33)$$

$$\lambda_n = h/n_n \cdot m_e c = 1.31958509 \times 10^{-15} \text{ m} \quad (34)$$

$$r_n = a \cdot \lambda_n / 2\pi = 1.53257897 \times 10^{-18} \text{ m} \quad (35)$$

$$E_n = n_n \cdot h c = n_n \cdot m_e c^2 = 1.5053563646 \times 10^{-10} \text{ kg} \cdot (\text{m/s})^2 \quad (36)$$

7. NATURE OF ELECTRICITY

In 1827, Andre-Marie Ampere found experimentally that two parallel conductors crossed by electric currents; they attract or repulse depending on the sense of the currents: attracting for the same sense, repulsing for the opposite senses [27].

The Ampere's experience shows that the Cuantoms in the mobile Electron's Cluster move in two directions: either right-gyrated (+) or left-gyrated (-) around their own axes caused by the Magnus Effect from the SqUDF populated by Gravitons, and around the Electron axis caused by the 'Magnus Effect from the SqUDF populated by Cuantoms, expressing „the electron dual Magnus effect’.

In 1920, Hans C. Oersted analysed the deflection of the magnetic needle by an electric current, He concluded: “all the observed facts can be explained if we assume that the negative „electric matter’ executes a rotation movement to the right, and the positive a rotation in opposite sense” [28].

In 1989, in Researches Institute for Telecommunications a simple experiment was presented with the achievement of the „effect of attraction and repulsion’ of two flexible balloons with devices for rotation around their own axes, one fixed to the floor near the wall, the other mobile on vertical support rods. After the mutual collision, the mobile balloon rises higher or lower than the height to which it rises in the situation without the rotational movements, depending on the directions of rotation of the balloons [29].

Starting from the equation established in 1979, regarding the mass equivalence of electricity resulted from the application of Einstein's equation to the Hydrogen atom [30], which expresses the law of gravity through a Riemann type geometric structural condition [31], where $m_H = 1.6735328365 \times 10^{-27} \text{ kg}$ is the mass of the Hydrogen atom; $n_H = m_H / m_e = 1.6735328365 \times 10^{-27}$ is the number of Cuantoms that composite the Hydrogen atom:

$$m_H \cdot c / \pi \cdot k_H = n_H \cdot m_e c / \pi \cdot k_H = \pm e_d = \pm 1.6021766208 \times 10^{-19} \text{ kg} \cdot \text{m/s} \quad (37)$$

$$k_H = m_H c / \pi e = 0.9956846267 / \text{rad} \quad (38)$$

where $\pm e_d = \pm 1.6021766208 \times 10^{-19} \text{ kg} \cdot \text{m/s}$ is the elementary dipolar electric charge of the hydrogen atom.

The original digital equation expressing the elementary electric charge of the electron and positron turned out like this [32]:

$$e = (4\pi/3k_e) n_e h c / v_e = (4\pi/3k_e) n_e m_e c^2 / v_e = \pm 1.6021766208 \times 10^{-19} \text{ kg} \cdot \text{m/s} \quad (39)$$

$$k_e = (4\pi/3)(n_e h c) / v_e e = 0.978379 / \text{rad} \quad (40)$$

where k_H and k_e express the refractive effect in the colliding process of the free wave cuantoms with the clusters of the Hydrogen atom, electron and positron.

The synchronisation effect of electric waves with gravitational waves, according to the equations (13), i.e. in phase rotation of both electrons and their component Cuantoms, generates the same interaction sense from all successive cycles.

The electric constant ϵ_0 , in reality expresses the ratio between the spin force of the Compton waves emitted by the Electron in the SqUDF and the square of the kinetic velocity of the Cuantoms in the Electron's Cluster, in the accordance with the following digital equation [32]:

$$\epsilon_0 = (4\pi/3k_e)^2 n_e h c / 4\pi r_e v_e^2 = 8.854187817 \times 10^{-12} \text{ kg} / \text{m} \cdot \text{rad} \quad (41)$$

The inverse of the magnetic constant, in reality is the spin force of the Compton waves emitted by the Electron in the SqUDF, in accordance with the following digital equation [32]:

$$1/\mu_0 = (4\pi/3k_e)^2 n_e h c / 4\pi r_e a^2 = \epsilon_0 c^2 = 7.957747163 \times 10^5 (\text{kg} \cdot \text{m/s}^2) / \text{rad} \quad (42)$$

The inverse of the characteristic impedance of the SqUDF, in reality is the spin mass flow of Cuantoms, as the spin force of the Compton waves emitted by the Electron in the SqUDF and the kinetic velocity of the Cuantoms in the Electron's Cluster, in the accordance with the following digital equation [32]:

$$1/Z_0 = (4\pi/3k_e)^2 n_e h_c / 4\pi r_e (av_e) = \epsilon_0 c = 2.65441873 \times 10^{-3} \text{ kg / rad.s} \quad (43)$$

8. ELECTRICAL NEUTRALITY AT NON-ELECTRICAL PARTICLES

Starting from the equation (37), the natural equations for the electrical neutrality were elaborated for the non-electrical particles such as Neutrons, Proneutrons, and Photons ($m_\gamma = h/c\lambda_\gamma$; $n_\gamma = (h/m_e c \lambda_\gamma)$; $E_\gamma = n_\gamma \cdot h_c$):

$$n_n m_e c / (\pm \pi k_n) = (\pm e_d) = \pm 1.6021766208 \times 10^{-19} \text{ kg.m/s} \quad (44)$$

$$n_{pn} m_e c / (\pm \pi k_{pn}) = (\pm e_d) \quad (45)$$

$$h/\lambda_\gamma / (\pm \pi k_\gamma) = (\lambda_n/\lambda_\gamma) \cdot (\pm e_d) \quad (46)$$

$$k_n = (h/\lambda_n) / (\pi \cdot e) = 0.99760479 / \text{rad} \quad (47)$$

$$k_{pn} = (h/\lambda_{pn}) / (\pi \cdot e) = 0.99568462 / \text{rad} \quad (48)$$

$$k_\gamma = (h/\lambda_\gamma) / (\pi \cdot e) = k_n = 0.99760479 / \text{rad} \quad (49)$$

where $\pm e_d$, equal in value to e , is the spin dipolar electric charge, as the 'phase switch factor ($\pm \pi$)' proves that during one half orbital cycle, the spin kinetic waves generated with a positive polarisation (left-gyrate), followed by a negative polarisation (right-gyrate) during the successive half digital cycles, thereby resulting in the electric neutrality per the entire orbital cycle; $(\lambda_n/\lambda_\gamma)$ is the Photon 'opacity reduction factor' compared to free Cuantoms in the SqUDF, relative to the Neutron having opacity factor equal to 1.

9. QUANTUM GRAVITY AND NUCLEAR FORCES

The Forces of the Compton Waves emitted by Electrons $((n_e \cdot h_c / r_e))$, located at the reciprocal distance λ_e attenuated on the distance with $(\pi r_e^2 / \pi \lambda_e^2)$, is equal to the force of the free Cuantoms that push the Electron Cluster from the SqUDF $(n_e \cdot h_c) \cdot r_e / \lambda_e^2$, according to the following digital equation:

$$F_{e\lambda} = (n_e \cdot h_c / r_e) \cdot (\pi r_e^2 / \pi \lambda_e^2) = (n_e \cdot h_c) \cdot r_e / \lambda_e^2 = e^2 / (4\pi \epsilon_0) / \lambda_e^2 = 3.9189482157 \times 10^{-5} \text{ kg.m/s}^2 \quad (50)$$

At distances smaller than λ_e , such as those between Nucleons (Neutrons, Proneutrons and Positrons) placed at the reciprocal distance λ_n , λ_{pn} , or $\lambda_{e+} < \lambda_e$, electrostatic waves cannot exist, but exist the force of the intercepted/scattered free Cuantoms that push the Nucleons, according to the following equations, where: the product $n_i \cdot r_i$ has defined as the 'Dimensional Constant of the Fine Structures'; G_q has defined as the Nuclear/Quantum Gravity Constant:

$$n_i \cdot r_i = n_e \cdot r_e = 3.48181632 \times 10^5 \text{ m} \quad (51)$$

$$G_q = n_i \cdot m_e c^2 \cdot r_i = e_d^2 / (4\pi \epsilon_0) = 2.3070775115 \times 10^{-28} \text{ kg.m}^3/\text{s}^2 \quad (52)$$

$$F_{qn} = (n_n \cdot h_c) \cdot r_n / \lambda_n^2 = e_d^2 / (4\pi \epsilon_0) / \lambda_n^2 = G_q / \lambda_n^2 = 1.3249013994 \times 10^2 \text{ kg.m/s}^2 \quad (53)$$

$$F_{qpn} = G_q / \lambda_{pn}^2 = 1.31981765036 \times 10^2 \text{ kg.m/s}^2 \quad (54)$$

$$F_{qe+} = G_q / \lambda_{e+}^2 = 3.9189482157 \times 10^{-5} \text{ kg.m/s}^2 \quad (55)$$

The equations (53) and (54) prove that 'Strong Nuclear Forces' are in essence 'Quantum Gravity' from interaction between hard nucleons (Neutrons and Proneutrons), which are about 10^6 times stronger than the equivalent electrical interactions at reciprocal distance λ_e , being concordant with the experimental measurements.

10. THE SUPERCONDUCTIVITY EFFECTS

In 1975, in the annual scientific session of the Researches Institute for Telecommunications of Bucharest were presented a Report on the two elements in the optical fibres patented in 1970, which generated excessive attenuation [33].

a) The photon wavelength of 633 nm, does not ensure the equality of the Photon energies with the energies of the Cuantoms that composed the Electron Clusters located on the last orbital shell (3p) of the Silicon atom, with which they interact in the optical fibre.

The speed of the Electron o(3p), where k_{Si} is a constant caused by the recoil effect of the Electron in the collision-scattering process of free Cuantoms in the SqUDF is given by the equations:

$$v_{e(3p)} = v_c / (4\pi/3) k_{Si} = 3.978361837 \times 10^5 \text{ m.rad./s} \quad (56)$$

$$k_{Si} = v_c / (4\pi/3) \cdot v_{e(3p)} = 0.9845877 \quad (57)$$

From the equality between Photon's energy and the energy that composed the Electron resulted the necessary Photon's central wavelength according the following equations:

$$h \cdot c / \lambda_\gamma = n_c m_e (v_{e(3p)})^2 / 2 = 1.28157795 \times 10^{-19} \text{ kg.(m/s)}^2 \quad (58)$$

$$\lambda_\gamma = h \cdot c / n_c \cdot m_e \cdot (v_{e(3p)})^2 / 2 = 1550 \times 10^{-9} \text{ m} \quad (59)$$

b) The optical diameter of the fibres of **62.5 μm** (equal to that of the natural silk fibres), does not ensure the sin-phase phasing of the photon waves in the successive reflective points inside the optical fibre, causing the return (i.e. reflection) of most of the photons transmitted by the laser in the optical fibre.

This condition is fulfilled when the distance projections on the direction of movement ($D_{FO} / \cos \phi$) traveled by photons between two successive reflection points divided by the wavelength projections remain equal to the value **$2\pi \text{ rad}$** , respectively the angles of incidence, denoted ϕ , remain equal to the angles of reflection on the entire optical fiber, as shown in the following original equation:

$$(D_{FO} / \cos \phi) / (\lambda_\gamma / \cos \phi) = 2\pi \text{ rad} \quad (60)$$

resulting the Optical Diameter of the necessary fiber, in addition to the a) condition, to achieve the optical super conductivity effect at optical fibers: as shown in the following original equation:

$$D_{FO} = 2\pi \lambda_\gamma = 9.74 \mu\text{m} \quad (61)$$

In 1992, Microwave Communications Inc. put into operation the transmission system called „Transatlantic TAT-10,’ using signals with a wavelength $\lambda_\gamma = 1550 \text{ nm}$ and optical fibres with a diameter $D_{FO} = 2\pi \lambda_\gamma$, and in 1996 „Transatlantic TAT-12/13’ using optical fibres with the same characteristics, at the capacity of 5 Gbps, which allowed the explosive development of the Internet throughout all around the world.

In 1998, superconductivity of optical fibers based on synchronizing reflections, allowed the transmission capacities of a optical fiber to be increased to 10 Gbps.

During the period 2000 - 2004, the national fiber optic telecommunications system called ON/OFF-GRID was created in Romania, using fibres with a optical diameter of (8-11) μm and central wavelength of the signals of **1550 nm**, consisting of 4600 km cables with 3x12 optical fibres, in an architecture with 9 Regional Rings, 4 Metropolitan Rings and 150 connections to the users IT&C nodes, with optical interconnections to similar systems in Europe, on the same type of superconducting optical fibers.

The sin-phase phasing effect for photon superconductivity can be applicable also for electric superconductivity in the nanotechnologies, taking into account that the speed of Electrons in conductors is $v_e = a \cdot c$, respectively, the distances between the phase inversion points at Electron's waves are **$1/a$** times greater than the electrostatic wavelengths in the SqUDF, according to the following equation for the diameters/thickness of Copper conductors and semiconductor junctions.

$$D_{cu} = 2\pi \lambda_e / a = 2.08910789 \times 10^{-9} \text{ m} \quad (62)$$

12. EXTRACTING ENERGY FROM SUBQUANTUM FLUID

Subquantum Physics remained an unknown Part of Nature until 1967, when the “effect of amplifying the power of radio waves by extracting the energy of the propagation medium” was discovered.

Received signal strength P_{rN} in direct line of sight from any transmitter having P_e the signal strength input to the antenna composed of N radiating panels, according to measurements made in 1967, [34], was N time greater than P_{r1} :

$$P_{rN} = N \cdot P_{r1} \quad (63)$$

Pr1 was obtained replacing the transmitting antenna with a single radiating panel fed with the same power P_e .

The equation (63) experimentally proves the following physical reality:

- Undele radio sunt unde Compton generate de electroni panourilor radiante, modulate cu semnalele analogice sau digitale, sonore, de imagine sau de date, induse electronilor prin miscarea lor ciclica in jurul unor puncte stationare din panourile aradiante, sub actiunea campului electric variabil din circuitul de alimentare al antenei, fiind in esenta unde cinetice de presiune (densitati volumice de energie), care se transmit simultan cu viteza cinetica c in toate punctele fluidului subquantum fundamental;
- The signals received and emitted by each radiant panel had the power P_e instead of P_e/N , caused by the “Ethernet effect”, where the antenna distributor does not divide the Compton waves received at the input port, but distributes them (as pressure waves), equally to all N output ports;
- The effect of extracting energy from the universal subquantum fluid also explains the multiplication the power emitted by the parabolic antennas of thousands of times [35], where the exciting dipole is equivalent to the antenna distributor and thaunds of micro-surfaes in the parabolic reflector are equivalent to radiant panels.
- The experimental measurement demonstrated that satellite radio communications were possible only by using the energy extracting effect from the universal subquantum fluid.
- The quantum amplification also occurs in the field of lighting with lamps composed of N LEDs fed in phase from a common distributor included in the lamp socket, where the respective effect causes the light power to be amplified aproximately of N times, achieving an energy economy of about 90%, for similar lighting.
- The research into the involvement of the energy extraction from the Universal Subquantum Fluid and celular subquantum and quantum gravity, applicable in living cells in the processes of growth, aging and regeneration, as well as in cellular therapies that prolong healthy life, remains unlimited for young researchers.

13. CONCLUSIONS

The new data, knowledge and information above presented demonstrate that in the science educational field, reanalysing the physical constants obtained by other brilliant researchers has led to a deeper knowledge of nature in its sub-quantum area hidden for experience with individual particles without electric charge, with a mass of 10^{20} times smaller than the electron mass, based on the using primary natural measurement units such as kilogram, metre, second and radian, can be also utilisable as complementary research method in physics.

The continuation of research regarding the use of new method remains open in quantum physics, chemistry, and biochemistry, as well as the irreversible increasing in mass of the Earth and Moon caused by the gravitational attraction of cosmic matter in the form of radiation and dust, having the following consequences:

- the gradual reduction of the distance between the Earth and the Sun;
- increasing the gravitational coupling between the Moon and the atmosphere, the waters, and the covering ground of the Earth, leading to the known catastrophic climatic and geophysical changes.

The stability of the Sun's mass was naturally solved by the balance between the energy received from gravitationally attracted cosmic dust, and the energy of the radiations resulted from its burning to over 1.5×10^6 K, which heats the planets, including the Earth.

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