Quantum Density of the Medium and Gravitational Potentials

Professor Vladimir Leonov

Abstract. The quantum theory of gravity characterizes the state of quantized space-time with a new parameter: the quantum density of the medium. The new parameter is the concentration of quantons in a unit volume of space. Quanton is a quantum of space-time is the basic particle in the quantum theory of gravity. The gravitational field inside the quantized space-time is characterized by four parameters of the quantum density of the medium: ρ_0, ρ_1 ρ_2 ρ_n. The quantum density of the medium is an analogue of the gravitational potentials. Each parameter of the quantum density of the medium has its own analog of the gravitational potential: φ_0, φ_1 φ_2 φ_n. Previously, the theory of gravity had only one gravitational potential: the Newtonian gravitational potential φ_n. Because of this, we had big problems for gravitational computing. The quantum density of the medium and additional gravitational potentials allowed us to solve many problems of the theory of gravity that were previously considered unsolvable. But we have the main thing: we created the quantum theory of gravity almost a quarter century ago [1, 2]. I am surprised when I see thousands of articles with the big names of the theory of quantum gravity, and inside these articles are empty and uninteresting. In theoretical physics, we have fierce competition between scientists. And only a few of them manage to say a newer word in physics once a century. I created the theory of Superunification, the theory of quantum gravity, quantum thermodynamics, quantum energy, a quantum engine and much more. The theory of Superunification is the basis of new energy and space technologies [1-6].
Keywords: quantum density, gravitational potential, theory of Superunification, quantum theory of gravity.

The quantum density of the medium is an analogue of the gravitational potentials. Each parameter of the quantum density (ρ_o, ρ_1, ρ_2, ρ_2) of the medium has its own gravitational potential (φ_o, φ_1, φ_2, φ_2). We described the parameters of the quantum density of the medium and gravitational potentials in [1-6]

To describe the regions of spherically deformed space- time, the theory of Superunification uses four gravitational potentials: $\varphi_0=C_o^2$, $\varphi_1 = C^2$, φ_n, φ_2 in contrast to classic gravitation in which only one Newton gravitational potential φ_n is known. The fact that the three additional gravitational potentials C_o^2, C^2 and φ_2 are unknown makes all the attempts of theoretical physics ineffective in development of the theory of gravitation. Taking into account that every value of the gravitational potential has its own quantum density of the medium, we can write the relationships between them through coefficient k_φ, denoting ρ_1' as ρ_n, i.e., corresponding to the Newton potential φ_n [5]:

$$k_\varphi = \frac{\rho_o}{C_o^2} = \frac{\rho_1}{C^2} = \frac{\rho_n}{\varphi_n} = \frac{\rho_2}{\varphi_2} = 4\cdot 10^{58}\,\frac{q}{J}\,\frac{kg}{m^3} = \text{const} \qquad (1)$$

The conversion coefficient k_φ (1) of the quantum density of the medium and gravitational potentials is a constant:

$$k_\varphi = \frac{\rho_o}{C_o^2} = 4 \cdot 10^{58} \frac{q}{J} \frac{kg}{m^3} = const \qquad (2)$$

From (1) we find the gravitational potential we need by writing it through the quantum density of the medium and the coefficient k_φ (2):

$$\varphi_1 = C^2 = \frac{\rho_1}{k_\varphi} = C_o^2 \frac{\rho_1}{\rho_o} \qquad (3)$$

$$\varphi_2 = \frac{\rho_2}{k_\varphi} = C_o^2 \frac{\rho_2}{\rho_o} \qquad (4)$$

$$\varphi_n = \frac{\rho_n}{k_\varphi} = C_o^2 \frac{\rho_n}{\rho_o} \qquad (5)$$

$$C_o^2 = \frac{\rho_o}{k_\varphi} \qquad (6)$$

And vice versa, from (3), (4), (5) we can write the quantum density of the medium through its gravitational potential:

$$\rho_1 = k_\varphi \varphi_1 = k_\varphi C^2 = \rho_o \frac{C^2}{C_o^2} \qquad (7)$$

$$\rho_2 = k_\varphi \varphi_2 = \frac{\rho_o}{C_o^2} \varphi_2 \qquad (8)$$

$$\rho_n = k_\varphi \varphi_n = \frac{\rho_o}{C_o^2} \varphi_n \qquad (9)$$

$$\rho_o = k_\varphi C_o^2 \qquad (10)$$

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