Our Quantized Universe is a Spherical White Hole in the Shape of a Ball

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Abstract. Astronomers have found that galaxies in our universe move with acceleration in towards the periphery of the universe, creating the appearance that the universe is expanding. In fact, we are seeing an accelerated recession of galaxies. The paradox is that according to Newton, motion with acceleration is possible only under the influence of external force, gravitation and antigravitation. There are no other explanations for this paradox. Galaxies do not have engines to create an external force. Gravity is contrary to the effect of expansion. It remains only to consider the effect of antigravitation that explains the movement of galaxies with acceleration (recession of galaxies). I have explained the antigravitation in 1996 when I discovered superstrong electromagnetic interaction (SEI) - the global energy field in the form of a quantized space-time consisting of quantons. Antigravitation is created as a result of deformation (Einstein's curvature) of quantized space-time in the form of a gradient of the quantum density of the medium and the energy gradient of the SEI. For this, the space-time of our universe must be deformed and curved, it must not be flat. The deformation vector of the quantum density of the medium should be directed to the periphery of the universe providing accelerated movement of galaxies. Antigravitation is realized by the gravitational field of a white hole with minus-mass (negative mass). **Our quantized universe is a spherical white hole in the shape of a ball.** This fact was established by me and published in 1996 [1] and then published a second time in the theory of Superunification in 2010 [2, 3].

Keywords: antigravitation, acceleration, galaxies, deformation vector, SEI, quantized space-time, spherical white hole, universe, boll.

In 1996, I discovered a quantum of space-time (quanton) and superstrong electromagnetic interaction (SEI). At the same time, when I was writing the theory of elastic quantized medium (EQM), I considered a model of our universe in the form of a spherical white hole in the shape of a ball [1]. In 2010, this model of the universe was published in my monograph in English [2-5].

6. Antigravitation. Minus mass. White holes (Publication: V. S. Leonov. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, pp 282-287).

Anti-gravitation is gravitational repulsion. There is an erroneous view according to which anti-gravitation is the hypothetical conjecture of theoreticians and does not exist in nature. In fact, the effect of antigravitation in nature is manifested as widely as gravity. Only its effect is found in the area of cosmology and also in the area of elementary particles at a distance is smaller than the conventional radius of the electron.

In the area of cosmology, anti-gravitation repulsion from the centre of the universe explains the accelerated recession of galaxies and the nature of these forces is also described in the theory of Superunification.

These zones of anti-gravitational repulsion at distances smaller than the conventional electron radius have been found in the elementary particles: the electron, positron, proton and neutron. This excludes the collapse of atomic nuclei, balancing the nuclear forces as the forces of electrical attraction of nucleon shells. Evidently, the electronic neutrino, as a dipole structure, has the minus mass showing repulsion forces at short distances and, at the same time, having a small interaction cross-section.

Since this study is concerned with cosmology, the minus mass as the source of gravitation, can be described by the two-component solution (8) of the Poisson equation and by the balance of the gravitation potentials (11), replacing the minus sign (–) by the plus sign (+):

$$C^2 = C_0^2 + \varphi_n \gamma_n, \tag{44}$$

$$\begin{cases} \varphi_1 = C^2 = C_0^2\left(1 + \dfrac{R_g \gamma_n}{r}\right) \\ \varphi_2 = C_2^2 = C_0^2\left(1 - \dfrac{R_g \gamma_n}{R_s}\right) \end{cases} \tag{45}$$

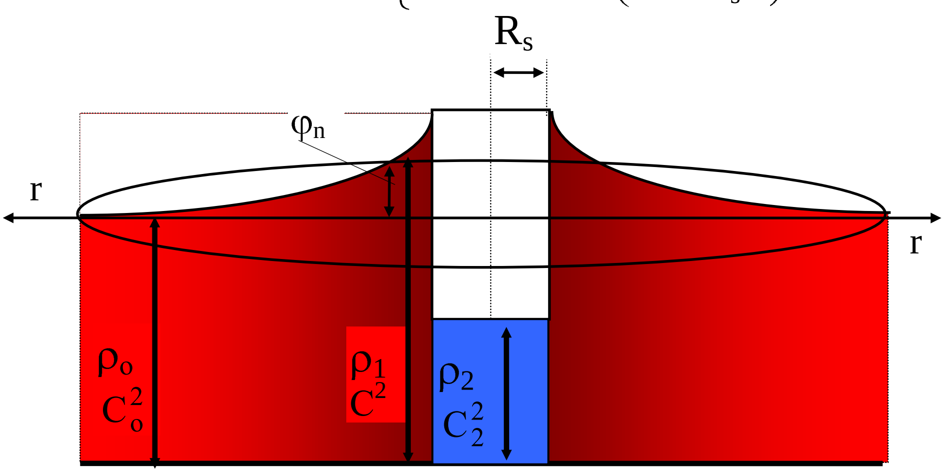

Fig. 15. The gravitation diagram of the minus mass.
The compression region is red, tension region blue.

Figure 5 shows the gravitation diagram of the minus mass in accordance with (44) and (45). In contrast to the plus mass (Fig. 5 and 12), the minus mass forms a hillock and not a well in the quantized space-time (Fig. 12) Formally, this explains the rolling of the trial mass from the hillock as the representation of repulsion forces. In fact, the direction of the deformation vector **D** of the quantized medium changes and the gradient forces of repulsion act from the centre of the minus mass. In any case, the gradient forces act in the direction of the region of the decrease of the quantum density of the medium and gravitation potential of the quantized space-time (Fig. 12 and 15). The heterogeneity of the quantized space-time determines the effect of the gradient forces in the quantized space-time. It should be mentioned that the positron, having the plus mass, relates to antiparticles. This means that the presence of the minus mass does not indicate that this mass is antimatter.

The minus mass can be in the state of a white hole (Fig. 16) on the condition:

$$\text{At } r = R_g, \quad \varphi_1 = 2C_0^2; \quad \varphi_2 = 0 \tag{46}$$

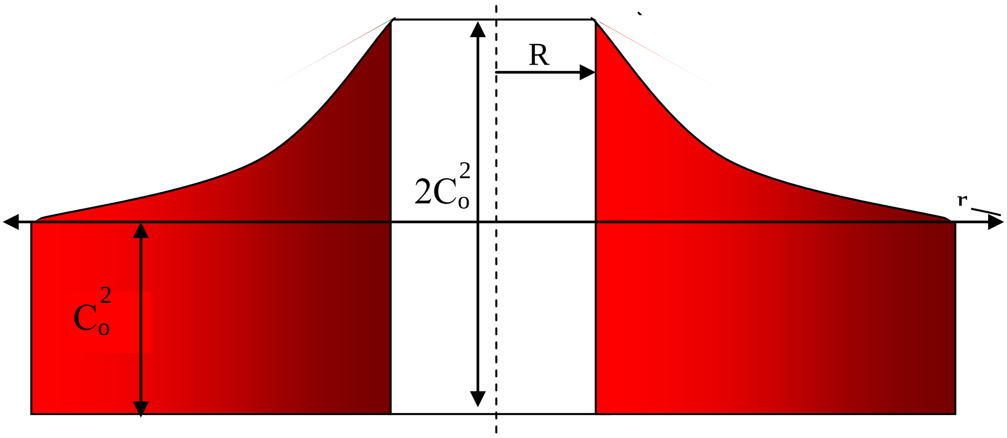

Fig. 16. The minus mass in the white hole state.

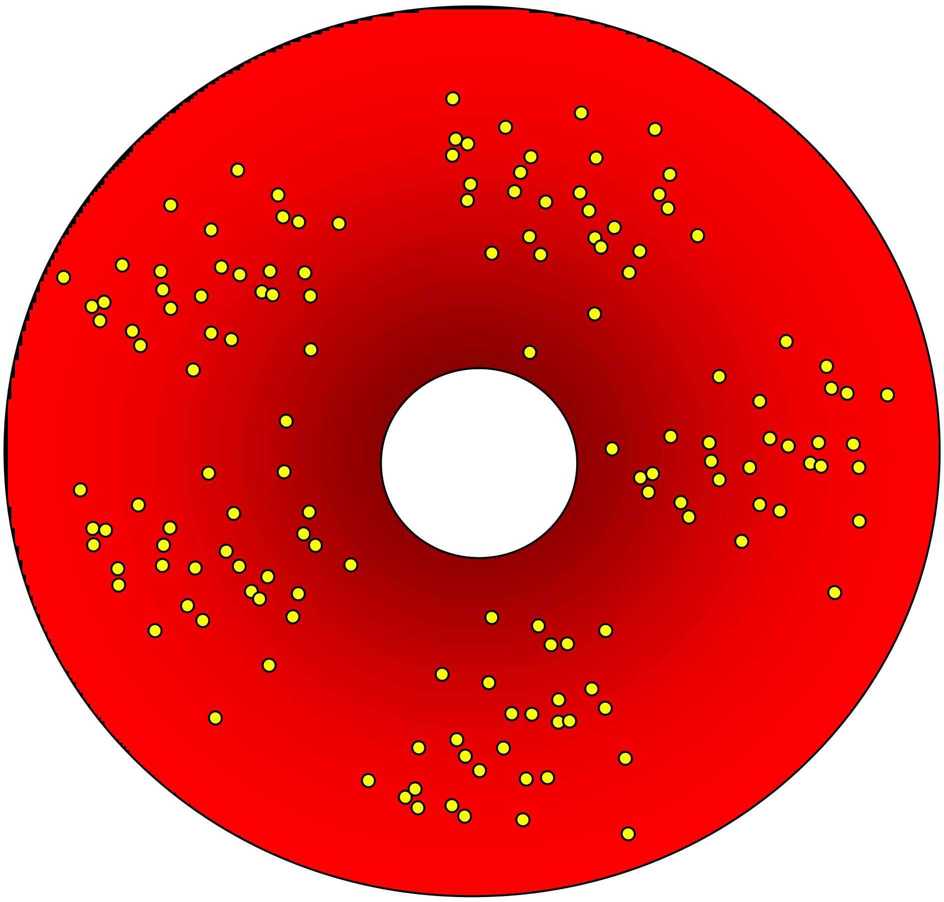

Fig. 17. Our post-inflationary quantized universe in the white hole state and the minus mass.

Evidently, our universe may be in the state of the white hole because only this state is characterized by the effect of the gradient forces from the centre of the universe on the galaxies starting acceleration of the latter. Figure 17 shows the possible scheme of our quantized universe in the state of the white hole and the minus mass. This means that our universe has the form of a sphere expanding as a result of inflation and the centre of the sphere contains a white hole (the absence of the quantized medium). This allows the possibility of a big bang preceding inflation releasing the quantons and bonded and free electrical quarks. It is likely that the inflationary theory will provide the answer to the process of expansion of our universe and individual stages of this expansion.

It is possible that the gradient of the quantum density of the medium directed from the centre of the universe to the periphery which determines the direction of the deformation vector and the accelerated recession of the galaxies, could be referred to as a gigantic gravitational wave which periodically changes the direction of the gradient of the quantum density of the medium. The recession of the galaxies is replaced by their movement in the direction to the centre of the universe. The state of our universe may be described by the Poisson equation and its two-component solution for the minus mass (45) under the condition (46):

$$\begin{cases} \varphi_1 = C^2 = C_0^2\left(1 + \dfrac{R_g}{r}\right) \\ \varphi_2 = C_2^2 = 0 \end{cases} \tag{47}$$

Unfortunately, the gravitation radius R_g of our universe as the minus mass is not yet known. The visible horizon of the universe is determined by the dimension 10^{26} m. However, this does not mean that we can see the actual image of the world. As indicated by Fig. 16, our universe is not flat and the quantized space-time is deformed from the centre to the periphery. The universe is distorted. In this deformed distorted luminiferous medium, the light beam is bent and does not travel along a straight line. The same galaxy can be seen from different sides as different objects. If a light beam from our Sun travels travel around a galaxy and returns to us, we would see our past. This is the real basis for a time machine to be used not for travel to the future but for observing the past.

The quantized space-time has gaps between quantons, i.e., the same wormholes and tunnels whose role should be investigated. The possible application of tunnels as channels ensuring the circulation of energy in the universe has been investigated as an example.

3.9. Antigravitation. Accelerated recession of galaxies (Publication: V. S. Leonov. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, pp 248-252).

Antigravitation is the opposite of gravitation. If the gravitational effect leads to the mutual attraction of the solids which rolled into a gravitational well (Fig. 3.15), the effect of antigravitation is directed to mutual repulsion of solids and particles. The effect of gravitation is linked with the plus mass (or plus density of matter) which is included in the solutions (3.77) and (3.78) of the Poisson equation (3.79) and (3.80). Antigravitation is associated with the formation of the minus mass (*–m*) in the elastic quantized medium. The effect of this mass changes the sign in the solutions (3.77) and (3.78) of the opposite sign:

$$\begin{cases} \rho_1 = \rho_o\left(1 + \dfrac{\gamma_n R_g}{r}\right) \quad \text{при} \ \ r \geq R_S \\ \rho_2 = \rho_o\left(1 - \dfrac{\gamma_n R_g}{R_S}\right) \end{cases} \tag{3.153}$$

$$\begin{cases} \varphi_1 = C^2 = C_o^2\left(1 + \dfrac{\gamma_n R_g}{r}\right) \quad \text{при} \ \ r \geq R_S \\ \varphi_2 = C_o^2\left(1 - \dfrac{\gamma_n R_g}{R_S}\right) \end{cases} \tag{3.154}$$

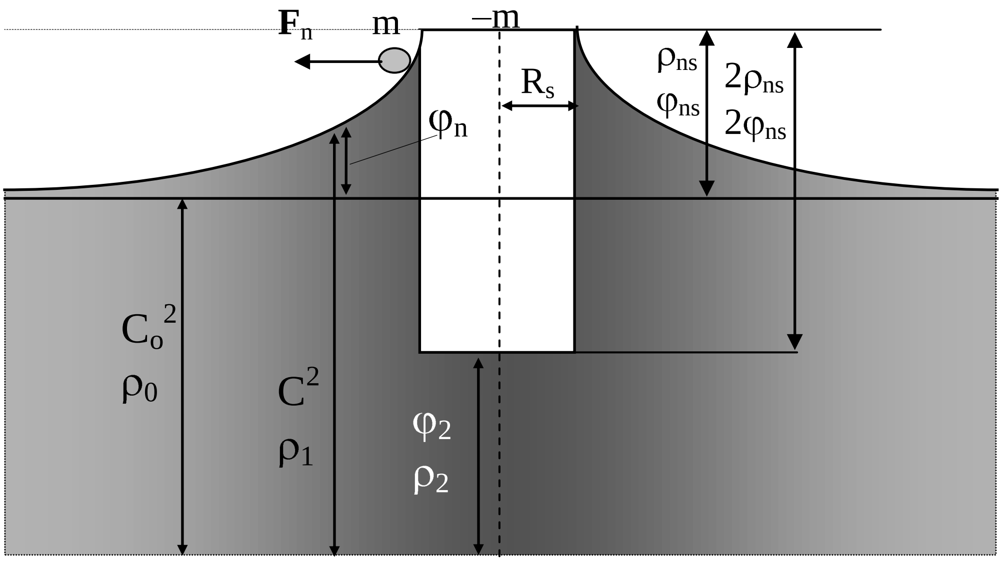

Fig. 3.19. Gravitational diagram of the minus mass and the effect of antigravitation repulsion (rolling from a hillock).

Figure 3.19 shows the gravitational diagram of the minus mass of the distribution of the quantum density of the medium (3.153) and gravitational potentials (3.154) [12, 15, 16]. The gravitational diagram of the minus mass differs greatly from the gravitational diagram of the plus mass (Fig. 2.11) by the fact that the quantum density of the medium inside the gravitational boundary R_S in the case of the plus mass increases as a result of its spherical compression and in the case of the minus mass the quantum density inside the gravitational boundary decreases because of its stretching. This is possible if the external tensioning of the quantized medium is greater than the tensioning of the gravitational boundary. Evidently, the state of the particles (solids) is highly unstable. This is confirmed by the actual absence of a large number of particles with the minus mass.

The presence of the minus mass does not yet mean explicitly that the particle belongs to antimatter. For example, the electron and the positron have the plus mass, although the positron is an antiparticle in relation to the electron. However, this is a very large problem, which is outside the framework of this chapter.

The presence of the minus mass is used as an indication of antigravitational interactions in which the particles (solids) have the property of antigravitational repulsion, in contrast to gravitational attraction. However, it should be mentioned immediately that the direction of the force is not determined by the presence of the mass or minus mass but by the direction of the deformation vector **D** (3.90) of the quantized medium which is always directed in the region its extension:

$$\mathbf{F}_n = \frac{C_o^2}{\rho_o} m \cdot \mathrm{grad}(\rho_1) = \frac{C_o^2}{\rho_o} m\mathbf{D} \tag{3.155}$$

For the plus mass (Fig. 3.15), force $\mathbf{F}_n$, like the vector **D** acting on the test mass m are directed to the bottom of the gravitational hole in the region of reduction of the quantum density of the medium.

The minus mass forms a gravitational hillock (Fig. 3.19). Vector **D** and also force $\mathbf{F}_n$ are directed to the region of reduction of the quantum density of the medium, i.e., in the direction opposite of the perturbing minus mass. It appears that the test mass m tends to roll down from the gravitational hillock, showing the properties of antigravitational repulsion.

It should be mentioned that the minus mass cannot always show the antigravitational properties. If the perturbing mass M forms a gravitational well, and the minus mass $[-m] << M$, the gravitational well is capable of pulling in the minus mass.

We encounter the phenomenon of gravitational repulsion in every days life. For example, orbital electrons do not fall on the atom nucleus because of the presence on the surface of nucleons of the gravitational interface which has the form of a steep gravitational hillock (Fig. 3.11). The electron finds it very difficult to overcome the hillock. In fact, the interface with radius R_S is a potential gravitational barrier which can be overcome only in the presence of a tunneling effect which is characteristic of the alternating shell of the nucleon. Electron capture is possible only in this case [14]. In other cases, the effect of antigravitational repulsion does not allow the electron to fall on the atomic nucleus. In this case, the antigravitation phenomenon is not linked with the minus mass and is determined only by the direction of the deformation vector **D** which is always directed into the region of reduction of the quantum density of the medium.

This example shows convincingly that antigravitation is also widely encountered in nature, like gravitation. This knowledge results in new fundamental discoveries. We can mention examples of the presence of an electron of the zones of antigravitational repulsion which have a significant effect in the interaction of the electron with other particles at shorter distances. The same zones are found, as already mentioned, in the alternating shells of the nucleons, generating repulsive forces at short distances, which balance the nuclear forces, not allowing the nucleons to merge into a single atomic nucleus and disappear in it [14]. At shorter distances, the effect of antigravitation is comparable with the effect of electrical forces because it is determined by the deformation vector **D** on a very steep gravitational hillock (Fig. 3.11) and not by interacting masses.

To complete this section, it is necessary to mention an example of global antigravitation repulsion on the scale of the universe which is experimentally detected as the effect of accelerated recessions of the galaxies [47]. It has been suggested in astrophysics that this effect can be explained only by the effect of antigravitation, but it is erroneously assumed that the centre of the universe contains a large quantity of hidden minus mass. As already mentioned, the effect of antigravitation should not be linked unavoidably with the presence of the minus mass, and it is sufficient to form the direction of the deformation vector **D** as a result of the redistribution of the quantum density of the medium.

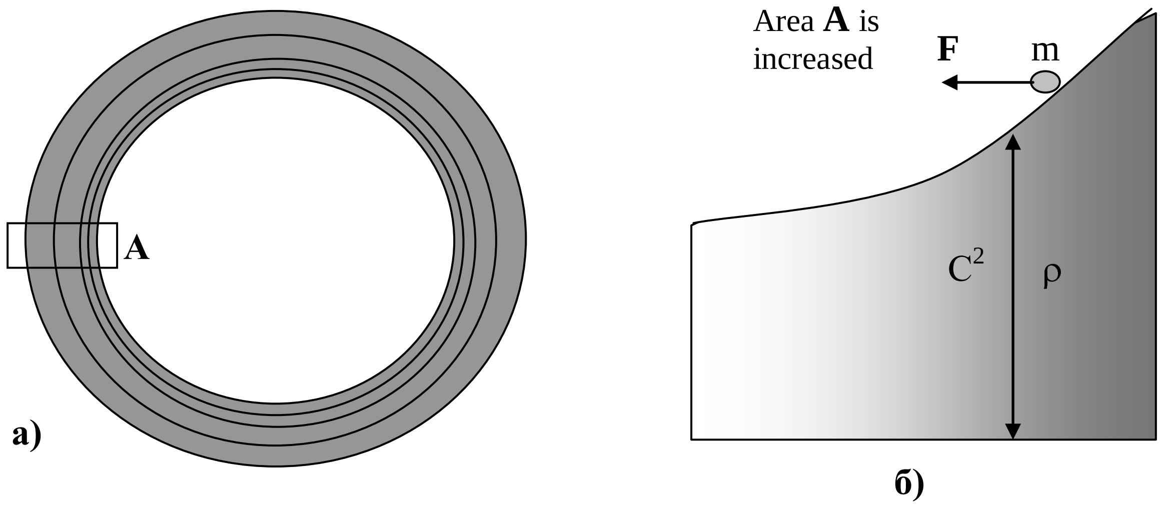

Fig. 3.20. The shell model of the closed universe (a) with the gradient of the quantum density of the medium and antigravitational repulsion of galactics (b).

This model of the universe with the cyclic redistribution of the quantum density of the medium whose gradient determines the direction of the deformation vector and forces in the region with a lower quantum density of the medium, was proposed as early as in 1996 [5, 6]. Figure 3.20a shows the model of a closed universe in the form of a spherical shell of a specific thickness filled with an elastic quantized medium. Inside and outside there is emptiness (or something we know nothing about). This shell has the form of a volume resonator with the oscillations of the quantum density of the medium which is cyclically distributed from the internal interface to the periphery, and vice versa. The distribution of the quantum density of the medium inside the shell in the region A at some specific moment of the oscillation period is shown in Fig. 3.20b. It may be seen that the gradient of the quantum density of the medium which determines the direction of the effect of the vector **D** and forces **F** is directed to the periphery and prevents accelerated recession of the galaxies.

In all likelihood, the period of natural oscillations of the universe, linked with the cyclic redistribution of quantum density of the medium in the thickness of the shell, can be expressed in tens of billions of years. It may be predicted that after one billion years, the redistribution of the quantum density of the medium in the shell of the universe changes to the opposite. In this case, the galaxies start to move in accelerated fashion to the internal interface of the universe. I do not present here the results of calculations of the cyclic oscillations of the quantum density of the medium in the shell model of the universe because this is the area of work of professional astrophysicists, like the investigations of black holes (Fig. 3.12).

Model of a quantized harmonic sinusoidal eternal universe (Publication: Leonov V.S., Theory of the elastic quantised space, Bisprint, Minsk, 1996, pp. 43-51).

We will record the state of a harmonic sinusoidal universe using a two-component solution of the Poisson gravitational equation [8].

For quantum density of the medium (space):

$$\begin{cases} \rho_1 = \rho_o\left(1 + \dfrac{R_g}{r}\sin(\omega t)\right) \text{ at } r \geq R_S \\ \rho_2 = \rho_o\left(1 - \dfrac{R_g}{R_S}\sin(\omega t)\right) \end{cases} \tag{1}$$

For gravitational potentials:

$$\begin{cases} \varphi_1 = C^2 = C_o^2\left(1 + \dfrac{R_g}{r}\sin(\omega t)\right) \text{ at } r \geq R_S \\ \varphi_2 = C_o^2\left(1 - \dfrac{R_g}{R_S}\sin(\omega t)\right) \end{cases} \tag{2}$$

where ρ_o is quantum density of undeformed quantized space-time;
ρ_1 is quantum density of deformed quantized space-time at $r \geq R_S$;
ρ_2 is quantum density of deformed quantized space-time at $r \leq R_S$;
$\varphi_o = C_o^2$ is gravitational potential of undeformed quantized space-time;
$\varphi_1 = C^2 = C_o^2(1 + \sin(\omega t))$ is gravitational potential of deformed quantized space-time at $r \geq R_S$;
φ_2 is gravitational potential of deformed quantized space-time at $r \leq R_S$;
R_S is radius of the gravitational boundery (the interface) between the regions of tension and compression (radius of the particle, body);
ω is cyclic frequency of the universe; t is time.

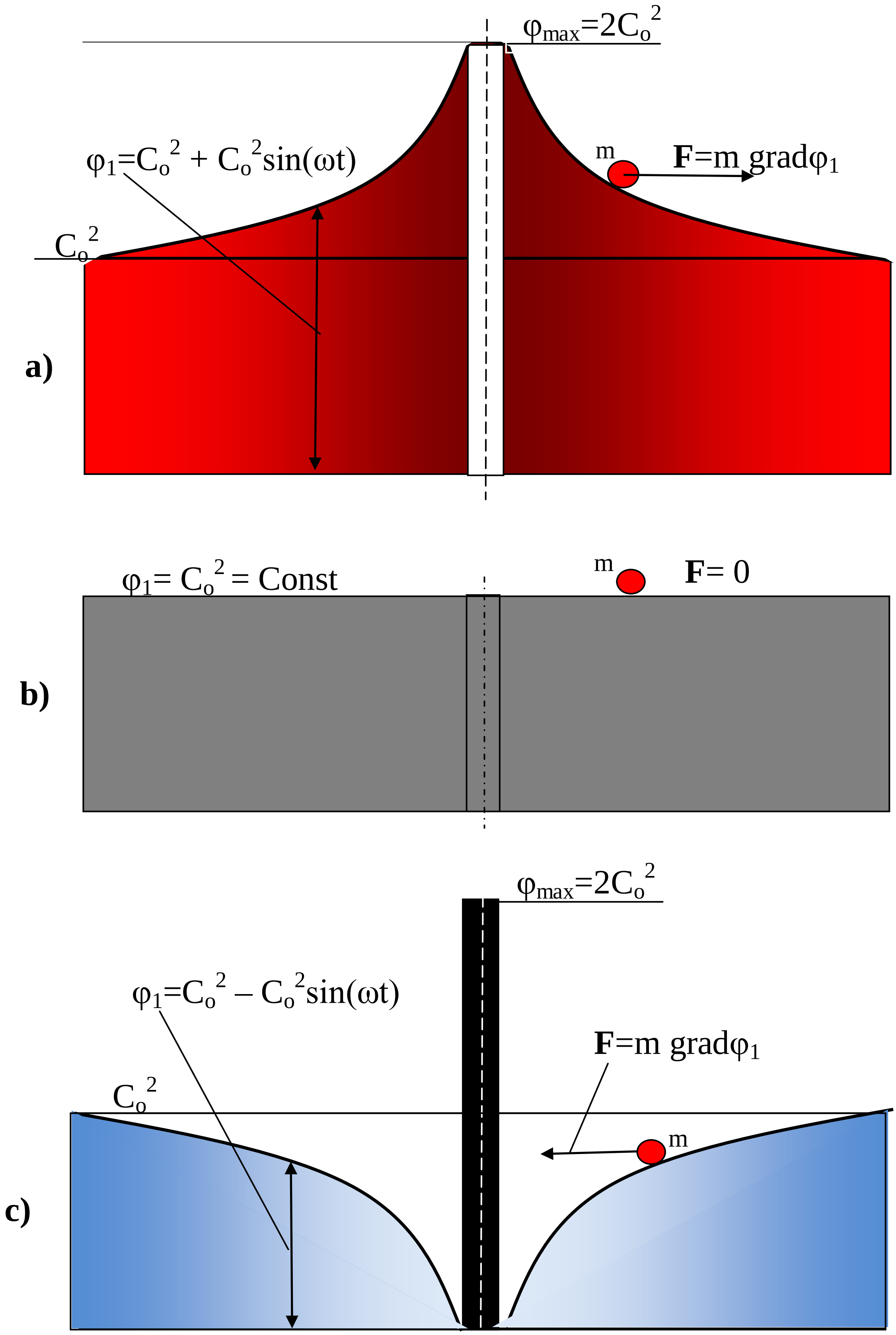

Fig. 1. Models of a quantized harmonic sinusoidal universe:
a) is a universe in a state of antigravity recession (white hole);
b) is a flat universe;
c) is a universe in a state of gravitational collapse (compression).

R_g is gravitational radius (without multiplier 2):

$$R_g = \frac{GM}{C_o^2} \qquad (3)$$

where G is gravitational constant;

M is total mass of the universe, kg;

Figure 1 shows the models of a quantized harmonic sinusoidal universe: a) is a universe in a state of antigravity recession (white hole); b) is a flat universe; c) is a universe in a state of gravitational collapse (compression).

From (1) and (2) at $r=R_S=R_g$ we find:

$$\begin{cases} \rho_{1S} = \rho_o(1+\sin(\omega t)) \\ \rho_{2S} = \rho_o(1-\sin(\omega t)) \end{cases} \qquad (4)$$

$$\begin{cases} \varphi_{1S} = C^2 = C_o^2(1+\sin(\omega t)) \\ \varphi_{2S} = C_o^2(1-\sin(\omega t)) \end{cases} \qquad (5)$$

The forces **F** acting on galaxies inside an inhomogeneous universe is caused by the gradient of the quantum density of the medium and the gradient of the gravitational potential φ_1 (2) [9]:

$$\mathbf{F} = \mathrm{grad}W = m \cdot \mathrm{frad}\varphi_1 \qquad (6)$$

where W is the energy, J.

We find the energy W (6) distribution through the energy w_{qv} concentration and quantum density ρ_1 (1) of the medium:

$$\begin{aligned} \mathbf{F} &= \mathrm{grad}W = \mathrm{grad}(w_{qv}\rho_1) = \\ &= w_{qv}\mathrm{grad}(\rho_1) + \rho_1\mathrm{grad}(w_{qv}) \end{aligned} \qquad (7)$$

The deformation vector **D** is included in (7) [10]:

$$\mathbf{D} = \mathrm{grad}(\rho_1) \qquad (8)$$

The deformation vector **D** (8) is a parameter of the gravitational field strength and it determines the forces **F** (7) acting in it. If there is a deformation of quantized space-time, then there is gravitational force in it.

We see that equations (1) - (5) describe the state of the sinusoidal universe in a simple form. A harmonic universe is periodically changing from a white hole state to a black hole state and vice versa according to a sinusoidal law. Now we are in a state of white hole and recession of galaxies when they run with acceleration from the center of the universe to its periphery.

Conclusions: The quantized universe has the shape of a ball, it is not flat. It has a diameter as a constant and it does not have the ability to expand. We can only observe the recession of galaxies when they run with acceleration from the center of the universe to its periphery. Dark energy does not exist in nature. We have 100% energy of quantized space-time which we perceive as dark energy.

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Additional materials:

[35] Vladimir Leonov. **The Energy Gradient is a Unified Formula for all Fundamental Forces.** viXra:1911.0026 *submitted on 2019-11-02.*

Abstract. Scientists around the world have been looking for a unified physics formula for over a hundred years. But this formula has been known since the time of Newton. This formula is very simple - the force **F** is equal to the energy W gradient: **F** = gradW (1). This formula of the force (1) rarely used in the calculations. We use the calculations mainly according to Newton's formula when the force **F** is equal to the mass m multiplied by the acceleration **a**: **F**=m**a** (2), where acceleration is the first derivative of velocity **v** with respect to time t or acceleration is the second derivative of the displacement x with respect to time t. Which formula is the main? The basic formula is: **F** = gradW (1). From the basic formula (1) all other formulas are derived including formula (2) and the law of universal gravitation. Formula (2) is secondary. Why the basic formula (1) is still in the shadows? The fact is that the energy gradient is based on the condition that energy fills all space-time like the ocean. This is an energy ocean. However, the Standard Model (SM) of Physics considers the zero energy level of a physical vacuum. But the zero energy gradients are zero. In a cosmic vacuum with a zero energy level should be no forces. But this contradicts the observed facts. In space there is a lot of forces and energy. It turns out that SM is a fake. In quantum the theory of Superunification I corrected all the errors of SM. In 1996, I discovered

superstrong electromagnetic interaction (SEI) - the fifth force (Superforce). SEI is the global energy field of the universe with the maximum level of energy. The SEI field has gradients of energy levels and it is heterogeneous. These energy gradients describe the action of all fundamental forces [1, 2].
Keywords: energy gradient, fundamental forces, theory of Superunification, superstrong electromagnetic interaction, fifth force (Superforce).

We write down the forces **F** through the energy W gradient and as the multiplication of mass m by acceleration **a**:

$$\mathbf{F} = \mathrm{grad}W \tag{1}$$

$$\mathbf{F} = m\mathbf{a} \tag{2}$$

Which formula (1) or (2) is the main? Next we prove that gradW (1) is a basic formula for the force **F** in physics and the formula (2) is derived from the formula (1). In the theory of Superunification [1, 2] we have a global energy W field as a function of coordinates (x, y, z) [3,4]:

$$W = f(x, y, z) \tag{3}$$

The global energy field W (3) is a scalar field. The energy gradient (1) already describes a vector force field, which has the direction and magnitude of the fastest change in the energy W in partial derivatives and is written using the Hamilton operator (nabla-operator) ∇ in a rectangular coordinate system:

$$\mathbf{F} = \mathrm{grad}W = \nabla W = \frac{\partial W}{\partial x}\mathbf{i} + \frac{\partial W}{\partial y}\mathbf{j} + \frac{\partial W}{\partial z}\mathbf{k} \tag{4}$$

where **i, j, k** are unit vectors along the x, y, z axes, respectively.

The energy gradient (4) is a vector function. The modulus of force F is determined by the square root of the sum of squares:

$$F = |\mathrm{grad}W| = \sqrt{\left(\frac{\partial W}{\partial x}\right)^2 + \left(\frac{\partial W}{\partial y}\right)^2 + \left(\frac{\partial W}{\partial z}\right)^2} \tag{5}$$

The direction **n** of the force **F** (1) as an energy gradient vector is determined by dividing the function (4) by its module (5):

$$\mathbf{n} = \frac{\mathrm{grad}W}{|\mathrm{grad}W|} = \frac{\frac{\partial W}{\partial x}\mathbf{i} + \frac{\partial W}{\partial y}\mathbf{j} + \frac{\partial W}{\partial z}\mathbf{k}}{\sqrt{\left(\frac{\partial W}{\partial x}\right)^2 + \left(\frac{\partial W}{\partial y}\right)^2 + \left(\frac{\partial W}{\partial z}\right)^2}} \tag{6}$$

To simplify the calculations, we write the energy gradient W (4) in partial derivatives for one coordinate x:

$$\mathbf{F} = \frac{\partial W}{\partial x} \tag{7}$$

Then we multiply the left and right sides of equation (7) by the time increment ∂t:

$$\mathbf{F}\partial t = \frac{\partial W}{\partial x}\partial t \qquad (8)$$

We transform (8) according to the rules of differentiation:

$$\frac{\partial W}{\partial x}\partial t = \frac{\partial W}{\partial x / \partial t} = \frac{\partial (0.5mv^2)}{v} = m\partial \mathbf{v} \qquad (9)$$

where $\partial x/\partial t = \mathbf{v}$ is the velocity, m/s;

$W = 0.5mv^2$ is kinetic energy, J.

We substitute (9) into (8) and obtain the equality of the impulse of force Ft and the momentum mv in differential form:

$$\mathbf{F}\partial t = m\partial \mathbf{v} \qquad (10)$$

From (10) we obtain the equation of Newtonian dynamics when the force is equal to multiplying the mass m of the body by its acceleration **a**:

$$\mathbf{F} = m\frac{\partial \mathbf{v}}{\partial t} = m\mathbf{a} \qquad (11)$$

Thus, we have proved that the basic equation is the energy gradient (1), and (10 and (11) are secondary equations. This energy gradient is created due to the electromagnetic structure of quantized space-time in the form of the global energy field SEI. SEI is the global energy field of the universe with the maximum level of energy. The SEI field has gradients of energy levels and it is heterogeneous. These energy gradients describe the action of all fundamental forces Newton's equations (10 and (11) can work only in the presence of a global energy field SEI [1-15].

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