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REAL GRAVITY

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ABSTRACT

The article presents the latest discoveries of astrophysicists of the rotation of the space environment together with galaxies, stars and planets, the rationale for gravitational funnels in torsion gravity is given, and the mechanism of instantaneous gravitational action described by the Euler-Bernoulli equations. Within the framework of the new cosmological model, which includes superfluid dark matter, it is proposed to revise Einstein's "vacuum field equation". A more complete equation of the field, taking into account the polarization medium of quantum vacuum (dark matter), was presented in 1998 by professor of the Institute of Mathematics of the Russian Academy of Sciences V. Dyatlov. The new equations include the density of matter and its speed as independent variables, their closure is possible only with the use of continuum mechanics. For the planet Mercury, a significant part of the orbit of which passes near the upper layers of the solar atmosphere in a plasma medium, a macroscopic approach can be applied, in which the hydrodynamic attachment of additional mass to spherical bodies of any nature in liquid and gas was experimentally established by Stokes.

KEYWORDS: *Dark Matter, Gravitational Constant, Kepler's Constant, Principle of Equivalence, Precession*

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1. INTRODUCTION

At the beginning of the article, you can ask a question as to what constitutes the cosmic fabric of space-time in Einstein's general theory of relativity. Let us recall the famous report of Minkowski made on September 21, 1908, at the 80th meeting of German naturalists in Cologne: "Gracious gentlemen! The view on space and time that I intend to develop before you has arisen on an experimental physical basis. This is their strength. From now on, space in itself and time in itself must turn into fiction, and only a certain kind of combination of both should remain independent" [1]. After that, Einstein announced as a mathematical model of space-time in SRT a special kind of geometric space, which he called "Minkowski space", and later, in 1915, he extended it to the entire Universe in the General Theory of Relativity as the theory of gravity [2]. Since then, Einstein's hypothetical fabric of space-time has been a kind of cosmic fabric of empty space. True, in 1917, Albert Einstein was forced to introduce a cosmological constant Λ into the equations of general relativity. The cosmological constant, a physical constant that characterizes the properties of vacuum, was introduced by Einstein so that the GR equations would allow a spatially homogeneous static solution as a counter to gravitational attraction, which could lead to the collapse of the Universe. Thus, the cosmological constant had to perform the function of antigravity (repulsion). Today, after the discovery by astrophysicists of dark energy and dark matter, which makes up more than 95% of the energy density of the Universe, the cosmological constant is needed to describe the effects of dark energy on the accelerated expansion of the Universe. The interpretation of the cosmological constant in the spirit of the concept of an antigravitating medium with a constant density was taken by astrophysicists as the basis for the standard cosmological model ΛCDM (Λ-Cold Dark

Matter) [3]. True, the question of how the accelerated expansion of the Universe is combined with a constant density still remains a mystery. In this regard, the statement of Academician of the Russian Academy of Sciences V.A. Rubakov, made in his interview “Energy is a dark concept”, is indicative. He says: “There is no law of conservation of energy in cosmology. The universe is expanding, and the energy density is constant. The volume increases - and the energy in this volume increases. Where does it come from? There is no law of conservation of energy” [4]. Indeed, in the closed Einstein's Universe with constant entropy, this cannot be.

2. SPACE ENVIRONMENT

Today, in a new cosmological model, where super fluid dark matter forms a halo around galaxies, stars and planets, I propose a new interpretation of recent astrophysical discoveries [5]. At the same time, it is not surprising that physicists try to explain all new discoveries in astrophysics in terms of Einstein's general theory of relativity; although today it can be said with certainty that the cosmic fabric of space-time is a phantom. But why do all astrophysicists feel his presence? The outer space of the Universe is 95% filled with dark matter, which does not emit electromagnetic radiation and does not interact with it directly. This property complicates and perhaps even makes it impossible to directly observe dark matter. But astrophysicists feel its presence and influence on all processes occurring in the Cosmos with ordinary (baryonic) matter, which is about 5% in the Universe. This is why the cosmic fabric of space-time took root in science at the suggestion of Albert Einstein. Consider the latest discovery by astrophysicists of the rotation of space-time around a white dwarf in the binary star system PSR J1141-6545, interpreted by them as a new proof of the correctness of Einstein's theory [6]. A white dwarf is the super dense core of an Earth-sized dead star left behind after a medium-sized star has exhausted its fuel and shed its outer layers. A rapidly spinning white dwarf dragging dark matter caused the pulsar's orbit to gradually change its orientation. This is Einstein's prediction, a phenomenon known as frame dragging, or the **Lense–Thirring effect**. It says that space-time will revolve around a massive rotating body, although, of course, it is not space-time that rotates, but a sphere of dark matter along with a star (Figure.1).

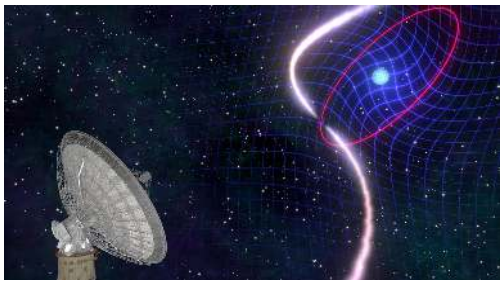

Figure 1: The Illustration of Lense-Thirring Frame-Dragging Resulting from a Rotating White Dwarf in the PSR J1141-6545 Binary Star System.

Astrophysicists have established that the dark matter halo forms spheres around galaxies, stars and planets that rotate with them. It is known that the share of ordinary, visible matter, of which everything that can be observed in the Universe consists of, is only 5%. Until now, it has not been possible to find about half of this share. A team of scientists led by Dominique Eckert from the University of Geneva in Switzerland found out where she disappeared. In their study, they used data obtained using the orbiting telescope XMM-Newton while observing the galaxy cluster Abell 2744, known as the “Pandora Cluster” (Figure. 2) [7].

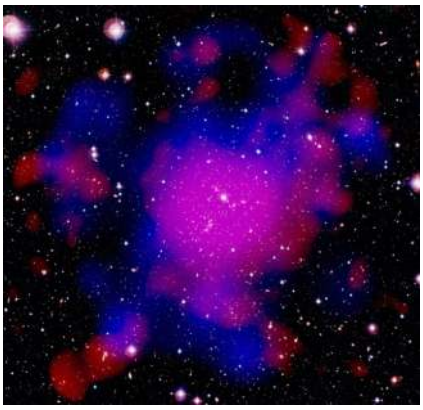

Figure 2: Components of the Cluster Of Galaxies Abell 2744.White Color-Galaxies, red Color hot Gas and Blue Color - Dark Matter.

The experiments with magnetometers and gyroscopes carried out in conducted in the A.F. Mozhaysky Military-Space Academy in the 90s of the 20th century, under the leadership of the Deputy Head of the Academy for by Scientific Work, Professor V.Fateev revealed the Lense-Tearing effect in the gravitational field of the rotating Earth, but the effect is extremely small and therefore difficult to measure [8]. Later, satellite experiments by astrophysicists from Germany also revealed the Tearing effect in the gravitational field of the rotating Earth [6]. Objects with more powerful gravitational fields, such as white dwarfs and neutron stars, offer better chances to see this phenomenon. Study lead author Vivek Venkatraman Krishnan, an astrophysicist at the Max Planck Institute for Radio Astronomy in Bonn, Germany, told that the researchers measured when pulses from the pulsar arrived at Earth to an accuracy within 100 microseconds over a period of nearly 20 years, using the Parkes and UTMOST radio telescopes in Australia. This allowed them to detect a long-term drift. The rapidly spinning white dwarf pulls on space-time has caused the pulsar's orbit to change its orientation slowly over time. The scientists detailed their findings in the journal Science [6].

The discovery by astrophysicist Vivek Krishnan of the rotation of a dark matter halo (the luminiferous medium of the ether) around a white dwarf provided a comprehensive explanation for the absence of a shift in the interference fringes in the Michelson-Morley experiments of 1881-1887. Michelson's experiment (Figure. 3) was aimed at detecting the motion of the Earth relative to the ether and was carried out on the surface of the Earth.

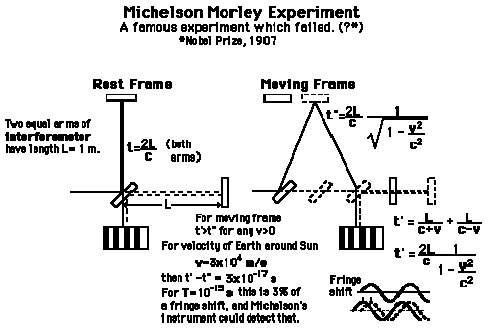

Figure 3: Michelson-Morley Experiment.

The device Michelson designed, later known as an interferometer, sent a single source of white light through a half silvered mirror that was used to split it into two beams travelling at right angles to one another. After leaving the

splitter, the beams travelled out to the ends of long arms where they were reflected back into the middle on small mirrors. They then recombined on the far side of the splitter in an eyepiece, producing a pattern interference fringes. If the Earth is traveling through an ether medium, abeam reflecting back and forth parallel flow ether take longer than beam reflecting perpendicular ether because time gained from traveling downwind less than lost traveling upwind, what result be delay in one of light beams that could be detected when beams were recombined through interference. Any slight change spent time would then observed, as shift in positions interference fringes. If a ether were stationary relative the Earth, then would be detected produce shift 4% size single fringe. In Michelson-Morley experiment, the light was repeatedly reflected back and forth along the arms of the interferometer, increasing the path length to 11 m. At this length, the drift would be about 0.4 size single fringe. In both cases, as in all subsequent more accurate experiments, the result was negative, i.e. the absence of a shift in the interference fringes says that there is no ether. But who says the ether would be at rest on the surface of the earth? He can move with the earth like the atmosphere. Observations astrophysicist Vivek Venkatraman Krishnan have proven this January 30, 2020 and buried Einstein's Special and General Relativity theory. Like the Earth's atmosphere, the halo of dark matter rotates counterclockwise with the planet — from west to east. Due to rotation, it, like the Earth, takes the form of an ellipsoid, that is, at the equator its thickness is greater than at the poles. It has been experimentally established that the radius of the Earth's gravity is approximately 900000 km. Therefore, the size of the sphere of dark matter should correspond to this value.

3. TORSION GRAVITY

In the new cosmology, the concept of the space environment performs the function of Einstein's hypothetical fabric of space-time in the phenomena of gravity, inertia, momentum and displacement of celestial bodies. The fact that curvature combines with energy suggests that torsion can combine with rotation, which is another constant. Thus, torsion gravity with rotating matter represents a complete medium for modern physics, with potential applications wherever spin effects may be important, from quantum mechanics to particle physics and cosmology. Today, "The fundamental theory of torsional gravity" by Professor Luca Fabbri is the most complete theory describing the dynamics of space-time, and since torsion is associated with spin in the same spirit in which curvature is associated with energy [9]. However, there is still controversy about the role of torsion other than curvature in gravity, and there may be several reasons for this. The single most important of these may be that the successes of Einstein's theory of gravity at the beginning of the 21th centurywere already too great to make anyone think about modifying it. At the beginning of the 20th century, spin was not yet discovered and Einstein, while developing his theory of gravity, adopted the Ricci tensor with zero torsion, because when the torsion disappears, the Ricci tensor is symmetric and, therefore, it can be consistently associated with the symmetric energy tensor, realizing the identification between the curvature of space-time and its energy content, expressed by Einstein's field equations. The left side in Einstein's field equation describes the curvature of space-time, while the right side describes the distribution of matter:

$$R\mu\nu - \frac{1}{2}g\mu\nu = \frac{8\pi G}{c^4} T\mu\nu \quad (1)$$

Where $R\mu\nu$ is the Ricci tensor; $g\mu\nu$ is the event space metric tensor; $T\mu\nu$ is the energy-momentum tensor of matter [2].

Einstein is talking about gravitational waves propagating in the free space, which means there is no matter, not even electromagnetic field, consequently the right hand side should be zero. So the equation is simplified to Rμν-1/2gμν=0,

which is equivalent to a more concise form Rμν=0, which is also known as "Vacuum Einstein Field Equation". However, now physicists say that instead of studying empty space, they can create a Bose-Einstein condensate and study the quantum vacuum. The behavior of dark matter in this energy state is similar to the behavior of atoms in a Bose-Einstein condensate (quantum fifth state of matter) obtained at a substance temperature close to absolute zero - 273.5 Celsius or 0 Kelvin [10]. In June 2020, the Bose-Einstein condensate was recreated in near-Earth orbit on the International Space Station (ISS). Only there it was possible to create all the conditions for the appearance of the quantum fifth state of matter within a few seconds, but this was enough for scientists to get an idea of how exactly dark matter moves and why we cannot see and feel it [11] (Figure 4).

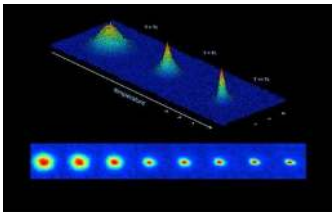

Figure 4: Bose-Einstein Condensate (BECS)

The torsion theory has realized the identification between the curvature of a gravitational funnel in a quantum vacuum (dark matter) and its energy content in the polarization theory of electrogravidynamics by Professor V.L. Dyatlov [12] and identification between torsion and its spin content in Dirac's spinor field theory [13]. The hypothesis of the existence of an inhomogeneous quantum vacuum (dark matter) in the form of rotating vacuum domains (spinors) allowed Professor Vyacheslav Dyatlov to combine Maxwell's electrodynamics and Heaviside's gravidynamics. This made it possible to determine the energy of a quantum vacuum domain (VD) in electric, gravitational, magnetic and spin fields [12]. Based on this, Dr. Vyacheslav Dyatlov suggests calculating the energy of a vacuum dipole (VD) as a four-dipole in four fields (E - electric, M - magnetic, G - gravitational, S - spin) in the following form:

$$W = W_E + W_G + W_M + W_S \tag{2}$$

Where $W_E = -\mathbf{dE}_0$; $W_G = -\mathbf{d}_G\mathbf{E}_{0G}$; $W_M = -\mu_0 \mathbf{l}_M \mathbf{H}_0$; $W_S = -\mu_{0G} \mathbf{l}_S \mathbf{H}_{0S}$.

- μ_0, μ_{0G} magnetic and magneto spin permeability's
- $\mu_0 = 1.257 \cdot 10^{-6}$ m·kg· $s^{-2} \cdot A^{-2}$
- $\mu_0 = 1.257 \times 10^{-6}$ m· kg· $c^{-2} \cdot A^{-2}$ $\mu_{0G} = 0.9329 \times 10^{-26}$ m kg^{-1}

4. ALBERT EINSTEIN'S CURVATURE OF SPACE-TIME AND THE GRAVITATIONAL FUNNEL IN A CONTINUOUS SPACE MEDIUM (QUANTUM FIFTH STATE OF MATTER)

In the new cosmological model, the gravitational well described by the spatial curvature of Albert Einstein can be replaced by a gravitational funnel created in the space environment (dark matter) around a rotating celestial body of astronomical dimensions [14] (Fig. 5). At the same time, it was found that the change in the gravitational potential occurs instantly in all areas of the space of the gravitational funnel in accordance with the pressure gradient described by the Euler-Bernoulli

equation for superfluid continuums. Perhaps this is the mechanism of instantaneous gravitational action, for which there is no screening.

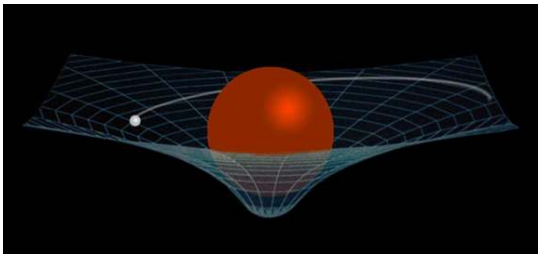

Figure 5: Gravity Funnel.

The change in the gravitational potential occurs instantly in all regions of the space of the gravitational funnel in accordance with the pressure gradient described by the Euler-Bernoulli equation for superfluid continuums:

$$\frac{\partial v}{\partial t} + \left(Vx\frac{\partial}{\partial x} + Vy\frac{\partial}{\partial y} + Vz\frac{\partial}{\partial z}\right)V = g - \frac{1}{\rho}\,\mathrm{grad}\,p \tag{3}$$

- *This* equation was established by L.Euler, 1755.

For a stationary flow without vortices, expression (3) is simplified, since in such a flow rotV at each point is equal to zero. It follows that for all flow points the motion of an incompressible fluid will be a potential:

$$\frac{v^2}{2} + U + \frac{p}{\rho} = \mathrm{const} \tag{4}$$

- *where U is the gravity potential.* $U = g\,z$ *(z is the height).*
- *Equation (4) is the Bernoulli's equation, 1738.*

Thus, we apply Newton's second law to describe the motion in a gravitational field of particles of a medium in a small volume element dV whose density is (ρ). The mass (m=ρdV) of the volume, multiplied by its acceleration ($a = \frac{\partial v}{\partial t}$), is equal to the resultant force acting on it. The resulting force consists of gravity (ρdVg) and force arising from the difference in the value of pressure (p):

$$\rho dV\frac{\partial v}{\partial t} = \rho dVg - dV\,\mathrm{grad}\,p \tag{5}$$

From the equation of motion, after dividing each term (5) by ρ dV, we obtain the Euler formula (3). The potential motion of the medium in a homogeneous gravitational field will be obtained by multiplying all the terms of the Bernoulli's equation (3) by the density:

$$\rho\frac{v^2}{2} + \rho gz + p = \mathrm{const} \tag{6}$$

- where ρgz = U is the gravitational potential.

Perhaps that is why the gravitational effect is transmitted instantly and cannot be shielded.

A number of experimental facts that cannot be explained in terms of Newton's law of gravitation and Einstein's

theory of gravitation of general relativity can be explained within the framework of the production of gravitation by a torsion model. Newton's law mathematically confirms long-term observations of the planets of the solar system. With its help, the positions of the planets are calculated for many years, but no one calculates the position of the Sun relative to the planets, since the Sun is always in the center of heliocentric coordinates. The world for this law is the planets of the solar system. For other objects of the solar system, the applicability of this law is not a fact. If we try to calculate the force of attraction not between the Sun and the Earth, but between the Earth and the Sun, it will become incomprehensible how the Earth, whose mass is insignificant in relation to the Sun, can attract the Sun to itself. The Earth in orbit is held by the gravitational force of the Sun and centrifugal force, but there is no centrifugal force of the Sun relative to the Earth. Therefore, if the Earth begins to attract the Sun towards itself then this will lead to a collision of the Sun with the Earth. From the foregoing, we can conclude that the size of the gravitational funnel created around the Earth by vortices of the excited quantum medium (dark matter) does not reach the Sun, and the Earth falls into the region of the Sun's gravitational funnel. Indeed, it has been experimentally established that the radius of the Earth's gravitational funnel is approximately 900,000 km, and the distance from the Earth to the Sun is 150,000,000 km. In the solar system, the action of the gravitation of the Sun and the gravitation of the planets are delimited! Planetary gravity funnels have finite dimensions and do not overlap. The practice of interplanetary flights shows that there is no smooth transition from the region dominated by solar gravity to the region dominated by planetary gravity. At the moment the spacecraft crosses the boundaries of these areas, there is an abrupt change in the “true” speed of the spacecraft. Moreover, for the correct calculation of interplanetary flight, the “true” speed of the apparatus within the planetary gravitational funnel should be counted only in the planetary centric frame of reference, and in interplanetary space - only in the heliocentric frame of reference. A jump in the speed of the ship (by tens of kilometers per second) when entering the gravitational funnel of Mars or Venus it is an experimentally confirmed physical effect [15]. The consequence of this jump is an unexpected Doppler shift of the carrier frequency during radio communication with the device and a change in the type of its trajectory. For this reason, a number of Soviet and American vehicles were lost during the first flights to Venus and Mars.

5. THE SPECIAL POSITION OF MERCURY IN THE SOLAR SYSTEM

Author will not discover America if recall the existence of boundary conditions within the framework of which a mathematical statement is valid or a physical theory is applicable. The boundary conditions also exist for the General Theory of Relativity. Since the time of Einstein, the calculation of the motion of the perihelion of Mercury has served as a touchstone on which the reliability of the theory of gravity was tested. Observational astronomy has long known that due to its proximity to the Sun and the influence of gravity of other planets, Mercury moves not just along an ellipse, but an ellipse, which itself slowly rotates 575′′ over a hundred years. The corrections calculated on the basis of Newton's theory gave the rotation of the perihelion 532′′, and Albert Einstein in 1915 obtained the expected value 43′′ using the field equations of general relativity [16]. This was not only his triumph, but also determined in the subsequent century the period of dominance of the General Theory of Relativity in physics. And now, a hundred years later, the Chinese academician Hua Di discovered a gross error in Einstein's calculations, and instead of the observed rotation of the orbit of Mercury 575′′ in 100 years, Einstein received in the framework of general relativity only 503.5′′ in 100 years [17]. On this occasion, Professor Lev Sapogin writes: “Einstein's authority in modern science is so high that the authors of many articles and books continue to stupidly reproduce Einstein's erroneous calculations. The above considerations reflect a completely gloomy general physical picture of the world.”[18]. Most modern physicists have dismissed this annoying “misunderstanding”, but the result obtained by Einstein demanded an explanation. Moreover, in 2018 a professor at the

Physics Institute P.N. Lebedeva, Nikolai Vladimirovich Kupryaev, by direct numerical modeling of the perihelion precession of the orbit of Mercury in the field of the spherical Sun within the framework of general relativity, also received an error of 71.63´´, that is, the same 503.5´´ for 100 years [19]. The reason for the error is related to the use of General Theory of Relativity outside of its boundary conditions. Geometry, as the theory of invariants of one or another group of transformations, the space-time of special and general theories of relativity (flat Minkowski space) is a four-dimensional real affine space with a metric of a certain singularity. In other words, SRT is a theory of invariance of the laws of physics in isolated stationary systems with respect to homogeneous motions. If we have in mind the symmetries that define uniform rectilinear motions, then we can share Feynman's point of view: "Symmetry relating to homogeneous rectilinear motions leads to a special principle of relativity." In other words, this principle takes place only in the case of rectilinear uniform motion of reference frames. In the case when the motion is accelerated, the special principle of relativity ceases to be valid. Einstein's attempts in the General Theory of Relativity to extend the principle of relativity to any kind of motion of matter were unsuccessful. The use by physicists of the General Theory of Relativity to describe irreversible processes in nonequilibrium systems leads to gross errors. Albert Einstein's General Theory of Relativity is reliable only when describing equilibrium systems, when invariance and the principle of mass equivalence are fulfilled, from which a geometric approach to gravity follows. In this case, the influence on the system from the outside is insignificant, but as noted by the Nobel Prize Laureate Ilya Prigogine, in nonequilibrium systems this influence becomes very noticeable. Based on the results of experiments the Professor I. Prigogine wrote: "In a steady state, the active influence from the outside on the system is insignificant, but it can become very important when the system goes into a nonequilibrium state, while the principle of equivalence is violated" [20]. In this case and the law of conservation of energy for closed systems are violated, since in real open systems the influence of the space environment is manifested. For the terrestrial planets rotating in stable low-perturbed orbits, the principle of equivalence is fulfilled, therefore, Einstein's general relativity is applicable, but for Mercury, whose orbit is subject to strong perturbations, general relativity is not applicable, since the influence on Mercury from the outside leads to an added (attached) mass. For the planet Mercury, a significant part of the orbit of which passes near the upper layers of the solar atmosphere in a plasma medium, we can apply a macroscopic approach, in which the hydrodynamic attachment of mass to spherical bodies of any nature in liquid and gas was declared by Stokes two centuries ago. This effect was experimentally tested in a plasma environment superfluid ^{3}He-B by Vladimir Shikin, an employee of the Institute of Solid State Physics, Russian Academy of Sciences, in 2013. We are talking about a complex force F (ω) acting from a liquid on a sphere of radius R, performing periodic oscillations with a frequency ω. Within small Reynolds numbers, we have [21]:

$$F(\omega)= 6\pi\eta R\left(1+\frac{R}{\delta(\omega)}\right)V(\omega)+3\pi R^2\sqrt{\frac{2\eta\rho}{\omega}}\left(1+\frac{2}{9}\frac{R}{\delta(\omega)}\right)i\omega V(\omega), \quad (7)$$

- $\delta(\omega) = (2\eta/\rho\omega)^{1/2}$

Where ρ - fluid density, η – viscosity, V - velocity amplitude sphere, δ (ω) - the so-called viscous penetration depth, which increases with an increase in viscosity and a decrease of the oscillation frequency

The real part of the expression (7) is a known Stokes force derived from the movement of fluid in the sphere. Imaginary component (coefficient of iωV) is naturally identified with the effective mass of the cluster added:

$$Meff\ (\omega R) = \frac{2\pi\rho R^3}{3}\left[1+\frac{9}{2}\frac{\delta(\omega)}{R}\right] \quad (8)$$

Origin added (attached) mass Meff (ωR), depending on the frequency ω and the radius R of the sphere of the cluster associated with the excitation of the field around a moving cluster of hydrodynamic velocity υ_i (r) and the appearance in connection with this additional kinetic energy. In superfluid, additional mass has two components: superfluid and normal [21].

As a result the value of the gravitational constant for the non-equilibrium system Mercury-Sun is different from the value of the gravitational constant for the terrestrial planets rotating in stable orbits. Geometric theory of Einstein's General Relativity, which requires compliance with the equivalence principle, does not allow this, and Newton's law can be modified for different values of the gravitational constant.

$$F = G\frac{M \cdot m}{R^2} \tag{9}$$

- Where G is the gravitational constant for each planet in the solar system;
- M is the mass of the Sun;
- m is the mass of the planet;
- R is distance from the center of the planet to the center of the Sun.

Observational astronomy of Newton-Kepler allows not only to establishink differences in the value of the Kepler constant, but also differences in the value of the gravitational constant between the Earth and the planet Mercury. Johannes Kepler formulated his laws of celestial mechanics based on the analysis of many years of astronomical observations. Fifty years later, Isaac Newton analytically derived Kepler's third law, as a consequence of the law of universal gravitation and the second law of dynamics, introducing the forces of gravity and inertia into the spatial model of the Universe. With the average velocity of the planet's orbital rotation v = 2πR/T, he obtained [22]:

$$K = G_0 M_0 \frac{m_g}{m_i} = \frac{R^3}{T^2} \tag{10}$$

- Where m g. Is the planet gravitational mass, interacting with the sun, the m_0 mass, produces a centripetal force of gravity;
- M i. Is the inertial mass of the planet. It is rotating around a circle of r radius and producing a centrifugal force of repulsion,
- R is a average value distance from the centre of the planet to the centre of the sun,
- T is a period of the planet rotation around the sun,
- G_0 is the gravitational constant, k is kepler's constant.
- Johannes kepler calculated the value of the constant k for 7 planets [22]:
- Earth, venus, mars k = 3.35 10^{24} km^3 $year^{-2}$

Saturn, Jupiter, Uranus $K = 3.34 \cdot 10^{24}$ $km^3 \cdot year^{-2}$ (11)

- Mercury $K = 3.33 \cdot 10^{24}$ $km^3 \cdot year^{-2}$

Note the difference in the meaning of Kepler's constant. For planets of the terrestrial group, rotating along stable, slightly perturbed orbits, K = 3.35, and for Mercury, whose orbit is subject to strong perturbations due to its proximity to the Sun, the value of K = 3.33, that is, less. Analysis of the Newton - Kepler formula (10) allows us to estimate the approximate value of the gravitational constant for Mercury Gm from the solution of proportion (12):

$$3.35 \cdot 10^{24}\ \text{km}^3 \cdot \text{year}^{-2} = G_0 M_0 \left[\frac{m_g\ \text{Earth}}{m_i\ \text{Earth}}\right], \text{ for Earth } \frac{m_g}{m_i} = 1 \quad (12)$$

- $3.33 \cdot 10^{24}\ \text{km}^3 \cdot \text{year}^{-2} = G m M_0 \left[\frac{m_g\ \text{Mercury}}{m_i\ \text{Mercury}}\right]$, for Mercury $\frac{m_g}{m_i} \sim 1$

Gm ~ 0.994 G_0 $G_0 = 6.67408 \cdot 10^{-8}$ dyn · cm²/g² and Gm ~ $6.63403 \cdot 10^{-8}$ dyn · cm² / g² [23]. At the same time, direct numerical simulation of the precession of the perihelion of Mercury's orbit, taking into account all the planets, as well as taking into account the spherical of the Sun, carried out in the framework of the modified Newton's law of universal gravitation with the value Gm ~ 6.63403×10^{-8} [dyn×cm²/g²], makes it possible to evaluate the result with an accuracy of ~ 570" ± 5". This is the most accurate result obtained at the Physical Institute P.N. Lebedev for the entire history of calculating the precession of the planet Mercury [23].

The above calculation of the gravitational constant (Gm) presented for the planet Mercury in the heliocentric system of Copernicus is valid only for the planets of the solar system. Nevertheless, the resulting formulas lead to reasonable ratios, so one can hope that they at least qualitatively correctly reflect the real situation.

6. CONCLUSIONS

Two experimentally confirmed facts that allowed the General Theory of Relativity to occupy a dominant position in science at the beginning of the 20th century and buried the ethereal theory of Nikola Tesla did not stand the test of time and were recognized as erroneous at the beginning of the 21st century. These are the Michelson-Morley experiments considered in the article and the calculation of the precession of the perihelion of the Mercury orbit in the field of the spherical Sun in the framework of Einstein's GR. Moreover, in the article "The Conflict between the Unitary Quantum Theory and the Special and General Theories of Relativity", Professor Lev Sapogin rejected the Lorentz transformations, in the interpretation of Einstein's SRT and GR [24]. So Sapogin claims that time does not slow down and does not accelerate in different frames of reference, but simply the speeds of all processes change equally under the influence of a changing gravitational potential. The increase in the mass of the particle with speed now occurs for completely different reasons, related to resonance and having a limit to increase. Even Einstein's famous postulate that in nature there cannot be speeds greater than the speed of light, since its violation is incompatible with the principle of causality, turned out to be untenable. Today, while paying tribute to Einstein's enormous contribution to science, one cannot fail to see that the blind faith of Einstein's followers in his infallibility hinders its development.

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