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JOURNAL OF

Torsion Gravity

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ABSTRACT

Based on the discovery by astrophysicists of dark matter halos around galaxies, stars and planets, it became possible to abandon the speculative concept of the spatial curvature of Einstein's space-time fabric and geometric gravity. Torsional gravity and spinors in fundamental theoretical physics should be based on a new cosmology, including a dark matter halo rotating with planets, stars and galaxies and forming funnels in the continuous space environment of a quantum vacuum (dark matter). The article discusses the nature of tornado and tropical hurricanes.

INTRODUCTION

Torsional gravity and spinors in fundamental theoretical physics should be based on a new cosmology, including a dark matter halo rotating with planets, stars and galaxies and forming funnels in the continuous space environment of a quantum vacuum (dark matter). Funnels that form potential holes for planets, stars and galaxies should be included in the main theory of quantum gravity, in which both curvature and torsion are present. In the new cosmology, the concept of a dark matter halo 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 spin, which is another constant. Thus, torsional gravity with rotating matter represents a complete environment for modern physics with potential applications wherever spin effects may be important, from quantum mechanics to particle physics and cosmology. I

Dark matter halos around galaxies, stars and planets

In the new cosmological model, the quantum vacuum is understood as a superfluid heterogeneous medium of dark energy and dark matter forming the galactic and intergalactic environment, which account for 95% of the average density of matter in the universe [1]. In this case, ordinary baryonic matter accounts for only about 5%. Possessing the property of gravity, dark matter forms a halo around planets, stars and galaxies. In the new cosmology, the concept of a dark matter halo performs the function of Einstein's hypothetical fabric of space-time in the phenomena of gravity, inertia, momentum and displacement of celestial bodies. In this case, gravitational funnels around planets, stars and galaxies are formed as a result of the rotation of the dark matter halo together with celestial bodies [2]. The last discovery by astrophysicists of the rotation of space-time tissue around a white dwarf in the PSR J1141-6545 binary star system, in the new theory of cosmology, is explained by the rotation of the dark matter halo [3].Pulsar is located 10,000 -25,000 light-years from Earth in the constellation Muska (fly), which is located near the famous constellation of the Southern Cross. PSR J1141-6545 surrounds a white dwarf with a mass roughly equal to that of the Sun White dwarfs are the superdense cores of dead Earth-sized stars that are left behind after medium-sized

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stars have exhausted their fuel and lost their outer layers. A rapidly rotating white dwarf pulling dark matter caused the pulsar's orbit to gradually change its orientation (Figure 1).

This prediction is a phenomenon known as frame dragging, or the Tearing effect. It says that space-time will revolve around a massive rotating body, although, of course, it is not space-time that revolves, but a sphere of dark matter along with a star. Satellite experiments have revealed dragging and dropping frames in the gravitational field of a rotating Earth, but the effect is extremely small and therefore difficult to measure. Objects with stronger gravitational fields, such as white dwarfs and neutron stars, offer a better chance of seeing this phenomenon. The lead author of the study is Vivek Venkatraman Krishnan, an astrophysicist at the Institute of Radio Astronomy. Max Planck in Bonn, Germany, said the researchers measured when pulses from the pulsar hit Earth to within 100 microseconds for nearly 20 years using the Parkes and UTMOST radio telescopes in Australia. This allowed them to detect long-term drift. The rapid rotation of the white dwarf in space-time caused the pulsar's orbit to slowly change its orientation over time. Scientists have detailed their findings in the journal Science [3]. Today observational astronomy has established the presence of dark matter halos, which form spheres around galaxies, stars and planets and rotate with them. The research is published in the journal Nature.

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) [4]. The presence of a sphere formed by dark matter near the Sun can explain the strange acceleration noted by American scientists when the automatic interplanetary station's Pioneer 10 and Pioneer 11 moved away from the Sun at a distance of more than 20 AU. When the effects of solar radiation have practically



Figure 1 The illustration of Lense-Thirring frame-dragging resulting from a rotating white dwarf in the PSR J1141-6545 binary star system.



Figure 2 Components of the cluster of galaxies Abell 2744. White color - galaxies, red color - hot gas and blue color - dark matter.

disappeared. The halo of dark matter allowed researchers to change Newton's law of gravity and propose a new formula for the calculation. Now, when calculating the motion of a spacecraft according to Newton's law of gravitation, it is necessary to take into account the additional variable mass of dark matter, which forms a sphere around the Sun. When the spacecraft leaves the solar system, the position of the center of gravity in the system Sun – sphere of dark matter will constantly shift in accordance with the flight of the spacecraft due to the displacement of dark matter:

$$\mathbf{F} = \mathbf{G} \frac{\left(\mathbf{M}\mathbf{o} + \mathbf{M}\mathbf{d}\right)\mathbf{m}}{\mathbf{R}^2} \left(\mathbf{1}\right)$$

where M₀ is the mass of the Sun,

Md is the variable mass of dark matter in near-solar space,

m is the mass of the spacecraft,

R is the distance between the ship and the center of gravity of the system.

Equation (1) is obtained from the assumption of the presence of a spherical halo of dark matter around the Sun, the gravitational effect of which will increase with distance from the space probe (the conditional mass of dark matter will increase) until the probe leaves the halo of dark matter surrounding the sun. For an explanation of what has been said, see figure 2. Pioneer 10 and 11 were launched in the early 1970s and explored the outer solar system. But in 1980, mission scientists noticed that spacecraft have unexpectedly drifted off course. Both spaceships experienced a slightly stronger force of attraction to the sun than expected, and since their launch, they have drifted off course by hundreds of thousands kilometers. Coherent radio Doppler data generated by the Deep Space Network with the Pioneer 10 and 11 spacecraft show an anomalous, constant, frequency drift that can be interpreted as an acceleration directed towards the Sun of magnitude (8.74 \pm 1.33) x 10⁻¹⁰ m·s⁻² at distances between 20 and 70 AU (Anderson, et al., Phys Rev D. 65:082004).

The axial rotation of black holes, stars and planets in

the dark matter halo is possibly due to the formation of strong magnetic fields around them. So, for black holes the magnetic field reaches a monstrous value of 2000 Tesla, for the Sun the magnetic field reaches 10 Tesla, and for the planet Earth the magnetic field reaches $5 \cdot 10^{-5}$ Tesla. Taking into account all the properties of the magnetic field in real electrodynamics [5] makes it possible to detect, in addition to the well-known transverse Lorentz forces, also the longitudinal magnetic field forces rotating black holes, stars and planets acting at an angle to the axis of rotation of the gravitational funnel [6]. 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 (Figure 3)[7].

The change in the gravitational potential occurs instantaneously in all regions of the gravitational funnel space in accordance with the pressure gradient described by Euler's-Bernoulli's equation for superfluid continuous media:

$$\frac{\partial v}{\partial t} + \left(Vx \frac{\partial}{\partial x} + Vy \frac{\partial}{\partial y} + Vz \frac{\partial}{\partial z} \right) V = g - \frac{1}{\rho} \text{ grad } p$$
(2)

This equation was established by Euler L, 1755.

For a stationary flow without vortices, expression (2) 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:

$$\frac{v^2}{2} + U + \frac{p}{\rho} = \text{const}$$
(3)

where U is the gravity potential. U = gz (z is the height).

Equation (3) is 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 = ρ dV) 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 (ρ dVg) and forces arising from the difference in the value of pressure (p):



$$\rho dV \frac{\partial V}{\partial t} = \rho dVg - dV \operatorname{grad} p \tag{4}$$

From the equation of motion, after dividing each term (4) 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 Bernoulli's equation (2) by the density:

$$\rho \frac{v^2}{2} + \rho g z + p = \text{const}$$
(5)

where $\rho gz = U$ is the gravitational potential.

Newton's Law mathematically supports long-term observations of planets in 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 word for this law is the planets of the solar system. For other objects in 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 becomes 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 to itself, then this will lead to a collision of the Sun with the Earth. The Sun and the Earth fall into the area of the Sun's gravitational funnel. 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 gravity of the sun and the gravity 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 [8]. 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. The fact of delimiting the gravitational planetary funnels naturally follows from the hypothesis of gravitation, which is based on the excitation of the cosmic environment



Torsion gravity

Today, "The fundamental theory of torsional gravity" by Professor Luca Fabbri [9] 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. 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 21st century were 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:

$$R\mu\nu - \frac{1}{2}g\mu\nu = \frac{8\pi G}{c^a} T\mu\nu$$
(6)

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.

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 $R\mu\nu-1/2$ g $\mu\nu R$ = 0, which is equivalent to a more concise form $R\mu\nu$ = 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. In it, sound particles and photons are heard in the background vacuum. The Euler-Bernoulli equations for superfluid continuous media (2-5) have indeed been known for a long time, but in torsional gravity, a Bose-Einstein condensate (dark matter) is used for the first time to describe the rotation of planets in a superfluid 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 (Figure 4) [10].

Einstein himself compared his equations to a building with one wing made of precious marble and the other of cheap wood. Indeed, the form of the mathematical tensor was the result of subtle geometric considerations, while the stress tensor, which specifies the "source" of space-time curvature, is described in terms of the macroscopic concepts of pressure and energy density [11]. And now these subtle



Figure 4 Bose-Einstein Condensate (BECs)

geometric considerations are crumbling.

If in Euclidean space the metric has the form $ds^2 = dx^2 + dy^2 + dz^2$, then in GR the metric has the form:

$$ds^{2} = c^{2}dt^{2} - (dx^{2} + dy^{2} + dz^{2})$$
(7)

where c is the speed of light;

t is time;

x, y, z coordinates in Euclidean space.

After the discovery of spin, a new metric was required, including, in addition to the rectangular Euclidean coordinates, the six angular Euler coordinates. Professor Gennady Shipov proposed mechanics that additionally take into account rotational effects [12]. He managed to connect the Cartesian coordinate system with the six angular coordinates of Euler. It turned out that, within the framework of such a geometry it was possible to explain a series of experiments in which the law of conservation of energy is violated. The excitation of quantum vacuum (dark matter), caused by the accelerated motion of bodies or their rotation, leads in open systems to the violation of the symmetries, conservation laws, and prohibitions caused by them. In this case, Riemannian geometry, allowing torsion to take its place in it, will be called the Riemann-Cartan geometry. In 1922 the French mathematician Cartan E [13] put forward a hypothesis, according to which the space around the spinning matter must be torsional. To check this conclusion, theorists of different countries have developed a theoretical model of a space that does not only curvature (as in Einstein's theory of gravity), but torsion [9]. When was a numerical estimate of the effect caused by torsion was carried out, it turned out to be negligible (amounting to about 10⁻⁶⁰). This result was obtained for Einstein's closed universe. Therefore, theorists of many countries have come to the conclusion that the torsion effect is currently time cannot be detected in experiments. This theoretical conclusion was made without analyzing the

existing experimental data showing anomalous phenomena generated by rotating material objects. Simple and clear experiments with gyroscopic systems by Professor Kozyreva N [14] and many other researchers observing the change in the weight of the processing gyroscope, the creation of thrust by the gyroscope and the "quantum" nature of its behavior suggest that the conclusions of the theory were wrong and the effect of torsion on the gravity of bodies can be very significant. It was noted experimentally that when the limiting speed of rotation of the rotors of electric motors and turbines is reached, spontaneous acceleration of the disks occurs in several cases and, moving vertically along the axis of rotation they break from the supports and fly out of the device. A similar accident occurred on August 17, 2009, at the Sayano-Shushenskaya hydroelectric power station. The turbine of the second hydroelectric unit suddenly began to rotate at a hypersonic speed, which led to the destruction of the fixing bolts, the destruction of the room, and the death of 75 people. The excitation of quantum vacuum (dark matter) leads in open systems to the violation of the symmetries, conservation laws, and prohibitions in the standard ACDM (A-Cold Dark Matter) model. This fact must concern into account in classical and quantum mechanics.

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 Dyatlov VL [15] and identification between torsion and its spin content in Dirac's spinor field theory [16]. The region of quantum vacuum (dark matter), in which energy is accumulated, will be called a domain. It is these formations in the form of moving vortex spinors of dark matter in the form of tangential cylinders, the axes of which were located parallel to the axis of rotation of the Earth, which was discovered during experiments with Artificial Earth Satellites (AES) equipped with magnetometers. The experiments were carried out at the Military Space Academy. AF Mozhaisky in the 90s of the 20th century under the leadership of the Deputy Head of the Academy for scientific work, Professor Fateev V. The staff of the Academy found that in the areas of tectonic faults, where there is an intense electromagnetic and gravitational interaction of energy between the Earth's liquid magma and cosmic dark matter, toroidal luminous vortices with sizes from microparticles to tens of meters (rotators, spinors, hadrons) are formed [17]. It is interesting that quantum spinors of dark matter in the form of tangential cylinders with axes parallel to the axis of rotation of the Earth are found not only in near-Earth space but also in the molten magma of the Earth's core [18]. It can be assumed that the described domains of dark matter should represent volumetric rotating resonators and serve as accumulators of electromagnetic and gravitational energy. 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. Based on this, Dr. Vyacheslav Dyatlov [15] 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:

$$W = W_F + W_G + W_M + W_S \tag{8}$$

where

$$W_{\rm E} = -dE_{\rm o}; \qquad W_{\rm G} = -d_{\rm G}E_{\rm oG}; W_{\rm M} = -\mu_{\rm o}l_{\rm M}H_{\rm o}; \qquad W_{\rm S} = -\mu_{\rm oG}l_{\rm S}H_{\rm oS}.$$

 μ_{o},μ_{oG} - magnetic and magnetospin permeabilities

 $\mu_{o} = 1.257 \cdot 10^{-6} \,\mathrm{m} \cdot \mathrm{kg} \cdot \mathrm{s}^{-2} \cdot \mathrm{A}^{-2}$

 $\mu_0 = 1.257 \times 10^{-6} \,\mathrm{m} \cdot \mathrm{kg} \cdot \mathrm{c}^{-2} \cdot \mathrm{A}^{-2} \mu_{00} = 0.9329 \times 10^{-26} \,\mathrm{m} \cdot \mathrm{kg}^{-1}$

Generally speaking, the fields E_0 , E_{0G} , H_0 , H_{0S} depend on spatial coordinates, but they can be approximately considered constants within the domain. Therefore, the dipole forces acting on the quantum vacuum domain, guided by the work of Academician Tamm [19], can be determined as follows:

$$\mathbf{F}_{\boldsymbol{B}} = \boldsymbol{\nabla} \ \boldsymbol{W}_{\boldsymbol{E}}; \tag{9}$$

$$\mathbf{F}_{\boldsymbol{B}} = \boldsymbol{\nabla} \quad W_{\boldsymbol{G}}; \tag{10}$$

$$\mathbf{F}_{\mathcal{M}} = \nabla W_{\mathcal{M}}; \tag{11}$$

$$\mathbf{F}_{\boldsymbol{\mathcal{D}}} = \boldsymbol{\nabla} \quad W_{\boldsymbol{\mathcal{S}}}; \tag{12}$$

where;

 F_{DE} is the force acting on the VD as an electric dipole;

 $\rm F_{_{DG}}$ $\,$ is the force acting on the VD as on the gravitational dipole;

 F_{DM} is the force acting on the VD as on a magnetic dipole (magnetic moment);

 $\rm F_{\rm \scriptscriptstyle DS}$ $\,$ is the force acting on the VD as a spin dipole (spin moment)

∇ is the gradient operator [15].

The combined theory of Dyatlov's electrogravidynamics and asymmetric continuum mechanics (Cosserat continuum) by Professor Merkulov V [20] made it possible to explain the nature of tornadoes and tropical hurricanes. A tornado originates from a mother cloud and descends down to the Earth in the form of a long trunk, inside which the air makes a rapid rotational movement at a speed that sometimes reaches the speed of sound. The mother cloud, which is a small tropical hurricane, has a so-called eye, in which there is dead silence, and has a spiral structure. The inner cavity of the tornado has significantly reduced

i € Liferature

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pressure. Self-luminous formations exist both in a relatively large tornado cloud and in a relatively small tornado funnel. It is known that a tornado emits electromagnetic waves, both in the light range of electromagnetic waves and in the radio range in the form of high-intensity white noise. The presence of an electric field in a tornado is evidenced by a large number of ball and linear lightning flashes accompanying the tornado. It was found that the trunk of a tornado tornado has a magnetic field corresponding to an electric current of hundreds of amperes. The incredibly intense rotational motion in a tornado-tornado can only be caused by a distributed moment of forces. This effect is explained by the fact that the spins of domains (spinors), in a polarized medium of a quantum vacuum in the region of electric discharges, initially oriented arbitrarily, under the action of a magnetic field acquire a predominant orientation in the direction of the field. And if in the initial state the total angular momentum of all spins was equal to zero, then in a magnetic field it acquired a certain value. According to the momentum theorem, this will cause the air masses to rotate in the opposite direction to the spins. Thus, we see in the phenomenon of tornadoes and tropical hurricanes all the physical properties that indicate the presence of vacuum domains (spinors) there. It should be pointed out that the behavior of vacuum domains in a tornado is completely identical to the behavior of ferromagnetic domains in the Einstein - de Haas experiments in a constant magnetic field. Spin polarization in the Einstein-de Haas effect is the rotation of the liquid volume at dS / dt \neq 0, where S is the total spin of the extracted liquid volume. Such spin polarization of vacuum domains in an electrified thunderstorm atmosphere can suck huge air masses into a terrible whirlpool of tornadoes and tropical hurricanes [20].

CONCLUSION

Based on the discovery by astrophysicists of dark matter halos around galaxies, stars and planets, it is proposed to include both the curvature of gravitational funnels and torsion into the main theory of quantum gravity. In the new cosmology, the concept of a dark matter halo performs the function of Einstein's speculative fabric of space-time in the phenomena of gravity, inertia, momentum and displacement of celestial bodies. The article discusses the nature of tornado and tropical hurricanes.

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