

Smulsky J.J. Real Forces and Unreal Hypotheses // Proceedings of the Natural Philosophy Alliance. 14th Annual Conference 21-25 May 2007 at the University of Connecticut at Storrs, USA. Vol. 4, No. 2. Published by Space Time Analyses, Ltd. Arlington, MA, USA.– 2008. – Pp. 240-241.

Real Forces and Unreal Hypotheses

Joseph J. Smulsky

Institute of the Earth Cryosphere of the Russian Academy of Sciences

Siberian Branch, Tyumen, RUSSIA

e-mails jsmulsky@mail.ru

Mankind has learned to explain the changes of the surrounding world with the help of forces representing interaction of one body on another. However, in the 20th century in micro- and a macrocosm, many new phenomena were considered without application of the concept of force. For their explanation various other hypotheses were used. Therefore such explanations of the world are hypothetical ones instead of real ones.

The Real Forces

The forces of interaction of some bodies on others are received in the mechanics as a result of their measurement. For example, the force of gravitational interaction of one body on another, with masses m_1 and m_2 , is received as the law of gravitation of Newton

$$\mathbf{F}_{12} = k \mathbf{R}_{12} / R_{12}^3, \quad (1)$$

and one charged body with a charge q_1 on another with a charge q_2 is as Coulomb law (1), where \mathbf{R}_{12} is the radius-vector from the first body up to the second; for the Newton law of $k = k_g = -Gm_1m_2$, and G is the gravitational constant; for Coulomb's law, $k = k_e = q_1q_2 / \epsilon$, and ϵ is dielectric permittivity of the medium.

Force (1) is received for the motionless charged bodies, but in the case of occurrence of movement of one body relative to another, there is a new kind of interaction. It is said that moving charge creates a current, and the current creates a magnetic field. As this charged body moves, the magnetic field changes, and its change, it is said, creates an electric field; *i.e.* additional action on the charged body.

The experimental Biot-Savart-Laplace Law for a current element and the Faraday Induction Law describe last two effects. With their account, in 1967 - 1968 I have received the differential equation for force of interaction of one charged particle on another, after solving which I have found force expressions in the form [1]:

$$\vec{F}_{12} = k \frac{\vec{R}_{12}(1 - \beta^2)}{\left\{ R_{12}^2 - [\vec{\beta} \times \vec{R}_{12}]^2 \right\}^{3/2}}, \quad (2)$$

where $\vec{\beta} = \vec{v}_{12} / c_1$; $c_1 = c / \sqrt{\mu\epsilon}$. Here μ is magnetic permeability of the medium; c_1 is speed of propagation of electromagnetic interaction in the medium, and \mathbf{v}_{12} is the velocity vector of the second particle relative to the first one.

The force of interaction between poles of the magnetized bodies is defined by similar expression [2]. These forces depend not only on the distance R_{12} between bodies, but also on their relative speed \mathbf{v}_{12} . At light velocity of the particle $\mathbf{v}_{12} = c_1$, *i.e.* $\beta = 1$, the force of interaction on it is equal to zero.

Hypothesis about Particles of Light

Radio waves and light also constitute interaction of one body on another. As a result of application of various electromagnetic waves it was deduced that they are propagated with speed c_1 . By researching of physical properties of light it was established that light is also an electromagnetic interaction, and is propagated with speed c_1 . The force of such interaction of a body on the charged particle is directed perpendicularly to its distance from a body and fluctuates around a zero value. So, light, as well as radio waves, is not object of a particulate nature. Light is a property of bodies, which consists in action of one body on another. The velocity of body movement and the speed of light propagation is not the same. The above-mentioned laws of electromagnetism determine the properties of propagation speed of interaction. They differ from properties of movement velocity of bodies. These differences cause misunderstandings many optical experiments involving light propagation between moving bodies.

Hypothesis About the Light Speed of Gravitation

If gravitation would be propagated with speed c_1 , the gravitational interaction between two bodies would be defined by the formula (2). Since I. Newton, many researchers involved the hypothesis about the finite propagation speed of gravitation. However, after more careful integration of the movement equations in view of interaction before not taken into account bodies, calculations under the theory of Newton gravitation began to coincide with observations. Therefore, Newton's law was affirmed, and the hypotheses were rejected.

At light speed of gravitation the calculations with force (2) at $k = k_g$ gives residual displacement of the Mercury perihelion in 200 times smaller than the observable one; *i.e.*, the light speed of

gravitation does not prove to be true. Except for the Mercury perihelion, there are other discrepancies between calculations under the Newton gravitation law (1) and observations. However, in the 20-th century research into the reasons of these discrepancies was not carried out. Renewed researches are necessary. Without them, the bases for final speed of gravitation do not exist.

Hypothesis About Black Holes

To overcome the Earth gravitation force on a particle it is necessary to give the particle space velocity $v_{2c} = 11.2$ km/s, and for overcoming of the Sun gravitation to give $v_{2c} = 500$ km/s. It is possible to imagine such star, for which v_{2c} is equal to the speed of light. If to accept a hypothesis that light consists of particles, such particles cannot overcome a star gravitation, and for the far observer, the star will be appear as a dark body, *i.e.* a black hole. It is possible, if the forces of gravitation are described the Newton law (1). In the case of light speed of gravitation propagation, the force is described by expression (2). Its value is much less than the force of Newton gravitation, and at the particle velocity equal to speed of light, the star does not act upon such a particle, and a particle from considered star will reach the observer.

So, the hypothesis about black hole has no basis, and from different points of view is erroneous. Firstly, light is not particles. And, secondly, particles of light at light speed of gravitation propagation do not change their velocity.

Hypothesis About a Deviation of Light

According to the General Theory of Relativity (GTR) the beam of light that is passing near to a star, for example the Sun, should bend. Bending is possible in case light consists of weighty particles, and the force of gravitation is described the Newton law (1). At the gravitation speed accepted in GTR, light speed, the action of a star on a particle moving with speed of light does not also appear and the particle goes rectilinearly without a curvature. So, this hypothesis is erroneous for the same two reasons as the previous one was.

Hypothesis About Gravitational Waves

The dependence of electromagnetic force \mathbf{F} accordingly of formulas (2) from particle movement velocity \mathbf{v} it is received as a result of the solving of the differential equations, which special case of solving is also the equation of an electromagnetic wave.

If force \mathbf{F} does not depend on velocity \mathbf{v} , then the variable interaction propagating with speed c_1 is not present. The gravitational interaction does not depend on velocity; hence, the gravitational waves are not present.

Hypothesis About the Expanding Universe

According to the Doppler effect, the light spectrum of an object that recedes from the observer, is shifted to the red side. According to observation, the further from us there is a galaxy, the more its spectrum of light is displaced to the red side. On this basis it is came to a conclusion about the expanding Universe.

However, by virtue of mutual gravitation in expanding systems of bodies, their velocities should decrease with increase of distance [2-3]. Only the forces of repulsion between bodies may create distribution of increased speeds with distance. As forces of repulsion between bodies are not present, velocities of bodies may not increase, therefore the Universe does not expand. Reddening of light with removal from its source is not explained by Doppler effect but by other reasons. They may be established at research of this phenomenon without use of hypotheses.

Hypothesis About the Big Bang

At extrapolation of a hypothesis of the expanding Universe in the past it is come to a conclusion that all its substance was concentrated in one point, and the Big Bang has resulted in expansion of the Universe. As the Universe does not expand, that, naturally, there was no Big Bang. All consequences, which follow from a hypothesis of the Big Bang, also are erroneous.

References

- [1] Smulsky, J.J. 1994. "The Electromagnetic and Gravitational Actions (The Non-Relativistic Tractates)". Novosibirsk: "Science" Publisher) 225 p. <http://www.smul1.newmail.ru/>. (In Russian).
- [2] Smulsky, J.J. **The Theory of Interaction**. (Novosibirsk: Publishing house of Novosibirsk University, Scientific Publishing Center of United Institute of Geology and Geophysics Siberian Branch of Russian Academy of Sciences, 1999 -293 p.) <http://www.smul1.newmail.ru/>. (In Russian).
- [3] J.J. Smulsky, **The Theory of Interaction** (Ekaterinburg: Publishing house "Cultural Information Bank". - 2004, - 304 p.) <http://www.smul1.newmail.ru/>. (In English).