Presentation of the law of negligible action

Introduction

The law of negligible action is currently unknown in physics. For this reason, it is not used in the interpretation of many physical phenomena. The law of negligible action manifests itself in several physical phenomena. These include the penetration of spherical lightning through a window pane, which is initiated by nature itself, and the manifestation of this law in the Boreal effect, which was discovered by Prof. Louis Rancourt, a physicist at College Boreal, Canada.*1) But the law of negligible action is most impressively presented in particle accelerators. There, particle physics researchers accelerate particles to enormous speeds and naturally come into contact with the law of negligible action. However, currently physicists interpret the phenomena observed there in the wrong way. For the understanding of physicists and all other people what the law of negligible action is, a computer version of the presentation of the law of negligible action will be presented here.

Assumptions for modeling the law of negligible action

Computer programs were used to model the law of negligible action: Gas2n_A.exe and files with the .gas extension and AtomStand.exe and files with the .ato extension. Two particles marked 1 and 2 were used for modeling. At the beginning, particles 1 and 2 are stationary in certain positions relative to each other. Then, particle 1 begins to move at a certain speed along the X axis next to particle 2. This movement and the interaction of particles 1 and 2 contribute to the movement of both particles along the Z axis. Along this Z axis, the particles move with the same speed, but in opposite directions. The magnitude of this velocity of particles 1 and 2 along the Z axis changes depending on the initial velocity of particle 1. And it is precisely the changes in the velocities of particles 1 and 2 along the Z axis, depending on the initial velocity of particle 1, that are a model testimony to the manifestation of the law of negligible action in phenomena physical.

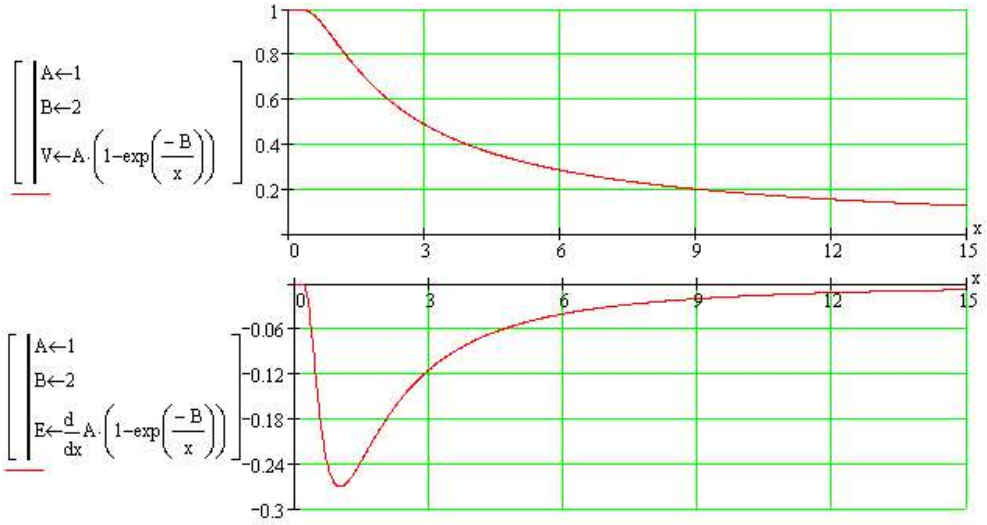
Interaction functions of particles of matter

The mutual acceleration of particles of matter has a complex form. It can be distinguished between a gravitational component and a structural component.

Newton studied gravitational acceleration and presented the results of his research in the form of a mathematical formula $a_n = \frac{G \cdot M}{R^2}$. Today we know that the gravitational force does not change exactly as Newton presented it. Because if it changed exactly according to Newton's law when the distance changed, then the orbits of the planets in the solar system would have the exact shape of an ellipse. And they don't have that shape. The most striking example is the phenomenon known as Mercury's perihelion motion.*2) Mercury's perihelion motion is slow at 42.98 arc seconds per century. But the existence of this motion shows that the actual orbit of this planet is rosette-shaped. The variability of Mercury's orbit can be described more accurately if an exponential factor is added to Newton's function. Then the variability of the gravitational acceleration can be written using a function in the form $a_n = \frac{G \cdot M}{R^2} \cdot \exp\left(\frac{-B}{R}\right)$. When analyzing motion, it is better to use this function, but written as a field intensity that changes depending on the distance R. It can also be written by adding a "minus" sign, which is recommended here to make the potential field function positive. Then the field intensity function along any ray that comes from the central point of the field has the form $E_p = \frac{-A \cdot B}{R^2} \cdot \exp\left(\frac{-B}{R}\right)$, and the potential of such a field is described by an exponential function, i.e. by the function E in the form $V_p = A \cdot \left(1 - \exp\left(\frac{-B}{R}\right)\right)$. In these formulas, A is the proportionality coefficient and B is the exponential coefficient.

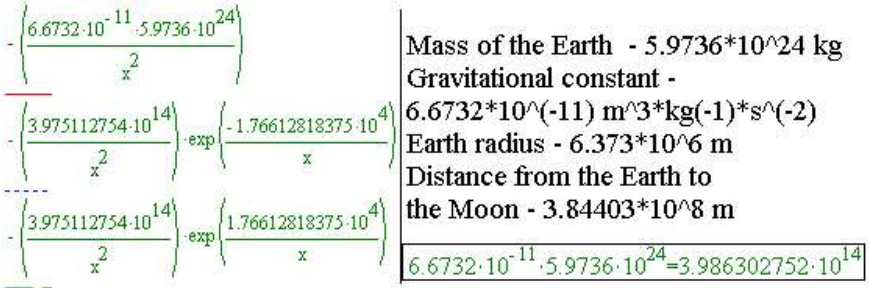
At large distances R (on the cosmic scale), the parameters of the gravitational field of a celestial body recorded in this way and the parameters according to the notation presented by Newton differ only to a small extent. Because as the distance increases, the exponential factor exp(-B/R) tends to one. But the exponential factor plays a large role in the description of the fields of individual components of matter, such as fundamental particles, atoms, molecules, as well as in the description of their mutual accelerations at small distances, on the order of the distance between the components in the nucleus of the atom and the distance between atoms.

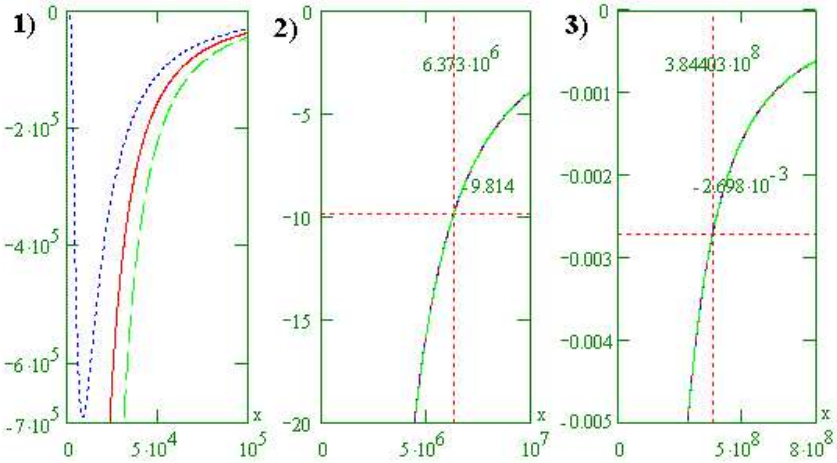
The graphs of these functions are shown below.



Function E – Field potential and field intensity – changes in gravitational field

And the finction charts below show that at cosmic distances, the difference in the gravitational interaction according to Newton's formula and according to the exponential function E, i.e. the same formula, but with an exponential factor, is imperceptible.

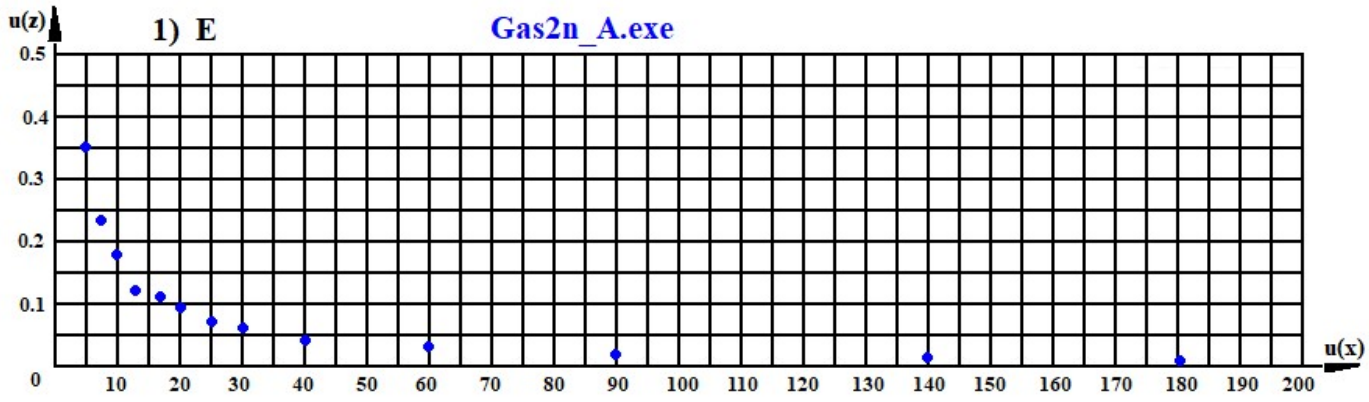




The calculations show that at the distance at which the Moon is from the Earth, the acceleration due to gravity according to Newton is approximately 0.002690146399 m/s^2. However, if an exponential factor is added to Newton's formula, then according to this exponential formula, the acceleration due to gravity at the location of the Moon is approximately 0.002690270004 m/s^2. The difference is 123.605*10^9 m/s^2 and it proves the existence of the Moon's perihelion movement. Of course, it also proves the existence of the movement of the Earth's perihelion and the orbits of the Earth and the Moon in the form of a rosette, not an ellipse.

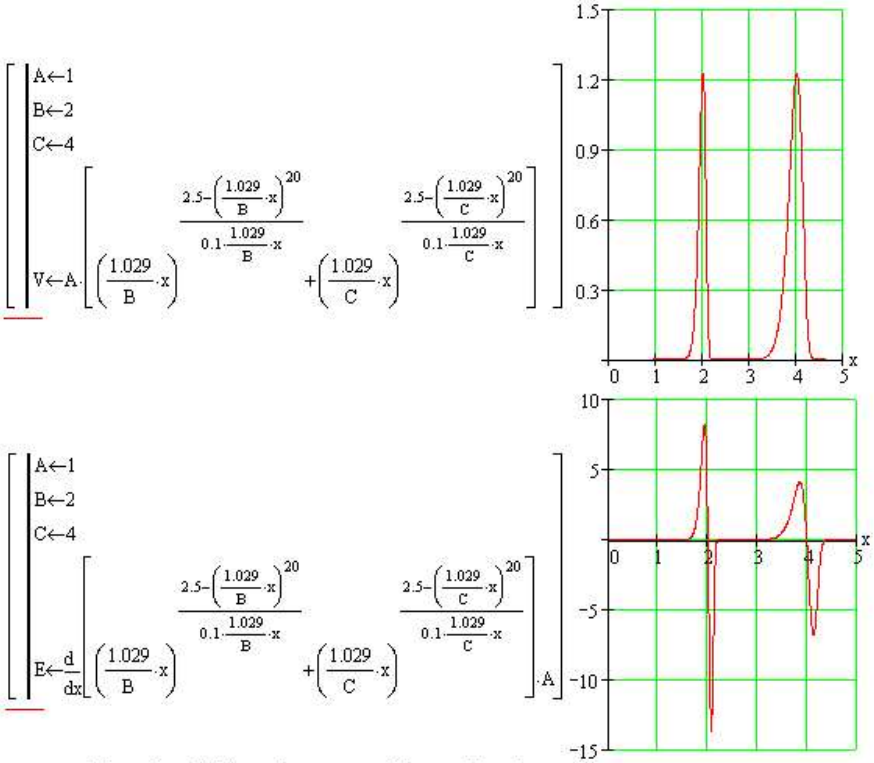
Computer modeling of the law of negligible action

In computer modeling of the motion of particles 1 and 2 relative to each other, one can first use the gravitational component of the interaction between the particles. The obtained results are presented below in the form of a dot plot **1) E**.



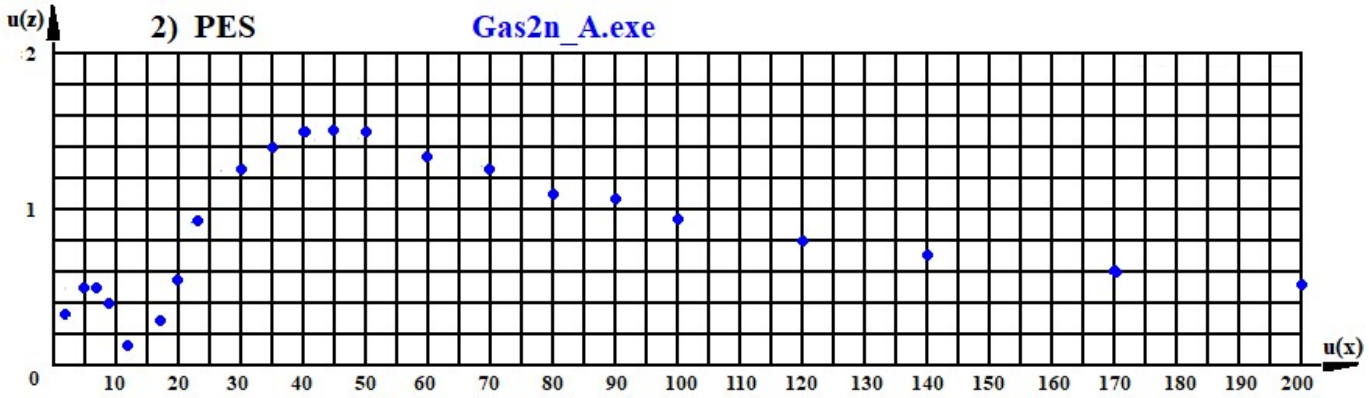
The results of the interaction at a speed of particle 1 less than 5 speed units are not presented, because then particles 1 and 2 move as one whole, i.e. as a stable structure.
For clarity, it should be added that when carrying out these exercises in the Gas2n_A.gas program, the E function was active in the "Formula" table.

The following exercises used the properties of the structural component of the interaction between particles, and more specifically, the properties of the potential shells. Two particles were used in the exercises (numbered 1 and 2) and each of them had one potential shell with a radius of 2 units of length. Two identical particles, when separated by a distance of 2.1 units, each of them is in the potential shell of its neighbor. Left alone, they create a stable structure, but are in constant motion relative to each other.
Below is a drawing with diagrams of the field potential and field intensity of a particle with two potential shells. The shells have radii of 2 and 4 units.



Function PES – polyexponenial sum function –
field potential and field intensity – changes in shell field

At these distances from the particle center there are points with extreme shell potential. A second similar particle located in the area of the shell vibrates between the slopes of this potential shell. Of course, both particles vibrate relative to each other. Because they are identical particles and each of them is located in the potential shell of its neighbor.
Before carrying out the exercises with two particles vibrating on their neighbor's shells, their motion was slowed down to almost zero. The "Cool" button was used to slow down the movement of particles in the Gas2n_A.exe program. After stopping the oscillating movement, the particles were located on the Z axis at the same distance from point 0. Before starting further exercises, particle 1 was moved parallel to the X axis "to the left" - the ordinate remained unchanged, and the abscissa was equal to -5. From this position the movement of particle 1 "to the right" began; in subsequent exercises at different speeds.
The results of modeling the motion of particles 1 and 2 relative to each other using the structural component of particle interaction are presented below in the form of a dot plot **2) PES**.

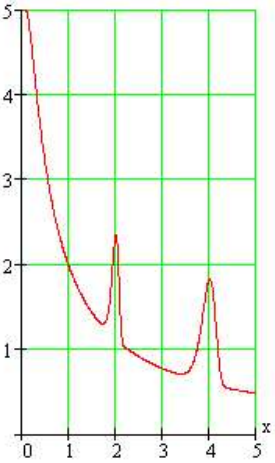


u(z)	2	5	7	9	12	17	20	24	30	35	40	45	50	60	70	80	90	100	120	140	170	200
u(x)	0,33	0,5	0,5	0,4	0,18	0,29	0,58	0,9	1,23	1,4	1,5	1,48	1,45	1,35	1,2	1,1	1,1	0,93	0,8	0,7	0,6	0,5

In this case, at a speed below 12 units. some kind of disorder is visible. This disturbance is the result of a longer time of interaction between particles 1 and 2, i.e. it is the result of the relatively low speed of particle 1. During this time, the particles are in the area of the potential shell of their neighbor and vibrate towards each other. As a result of this vibration, the final result of their velocity along the Z axis changes its sign from minus to plus or vice versa.

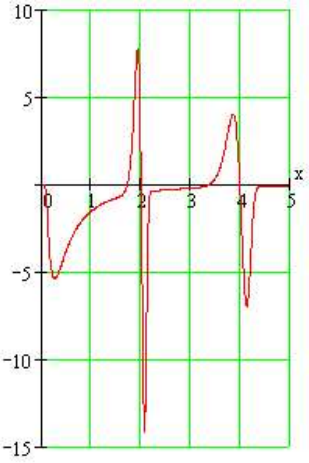
In both versions of the exercises with two particles, i.e. in the mutual interaction of particles according to the gravitational E function and according to the structural PES function, the law of negligible action is manifested. The essence of this law is very simple - increasing (in subsequent exercises) the speed of particle 1 contributes to reducing the mutual interaction of particles 1 and 2. But there is a significant difference. In the case of particles interacting according to the PES function, the law of negligible action begins to manifest itself only when the speed of the particles relative to each other exceeds a certain value. But for the meaning of the law of negligible action in nature, this difference is not important. Because both of these types of interactions are inextricably linked and are encoded in the structure of matter particles.
Below are schematic diagrams of mathematical functions that are related to and describe these interactions.

$$\begin{bmatrix} A\leftarrow 1 \\ B\leftarrow 2 \\ C\leftarrow 4 \\ D\leftarrow 0.5 \\ V\leftarrow A\cdot\left[\left(\frac{1.029}{B}\cdot x\right)^{\frac{2.5-\left(\frac{1.029}{B}\cdot x\right)^{20}}{0.1\cdot\frac{1.029}{B}\cdot x}}+\left(\frac{1.029}{C}\cdot x\right)^{\frac{2.5-\left(\frac{1.029}{C}\cdot x\right)^{20}}{0.1\cdot\frac{1.029}{C}\cdot x}}+5\left(1-\exp\left(\frac{-D}{x}\right)\right)\right] \end{bmatrix}$$



Complex function - polyexponential sum and exponential - Function EPES - hypothetical distribution of potential in the vicinity of the centre of c.s. field

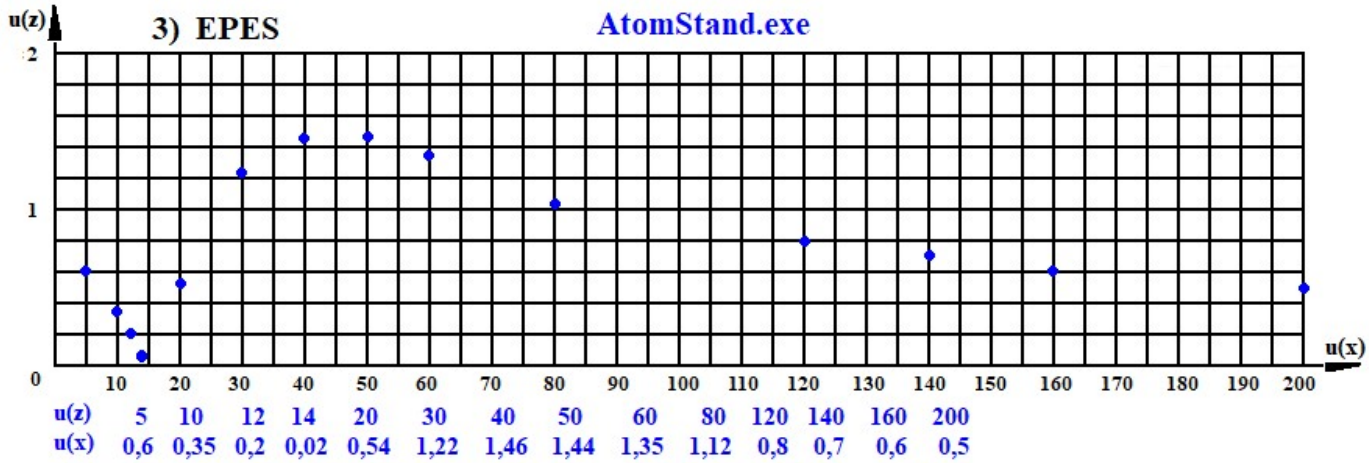
$$\begin{bmatrix} A\leftarrow 1 \\ B\leftarrow 2 \\ C\leftarrow 4 \\ D\leftarrow 0.5 \\ E\leftarrow \frac{d}{dx}A\cdot\left[\left(\frac{1.029}{B}\cdot x\right)^{\frac{2.5-\left(\frac{1.029}{B}\cdot x\right)^{20}}{0.1\cdot\frac{1.029}{B}\cdot x}}+\left(\frac{1.029}{C}\cdot x\right)^{\frac{2.5-\left(\frac{1.029}{C}\cdot x\right)^{20}}{0.1\cdot\frac{1.029}{C}\cdot x}}+5\left(1-\exp\left(\frac{-D}{x}\right)\right)\right] \end{bmatrix}$$



Field intensity in the vicinity of the centre of c.s. field with potential changing according to Function EPES

Potential shells of matter particles are the basis for the construction of all kinds of structures in nature. Thanks to the nuclear potential shells of protons and neutrons, which in the closest distance surround the center of each nucleon, atoms of all chemical elements are created. Thanks to molecular potential shells, which surround the center of each nucleon and have much larger radii than nuclear shells, molecules of all chemical compounds and all kinds of permanent structures of matter are created. Thanks to the influence of potential

shells, the material is resistant to tearing and compression and elasticity. In matter, there are all kinds of resistances to the propagation of various types of waves, particles and larger objects.
It is these resistances, in their elemental form, that are visible in the **3) EPES** dot plot below.



u(z)	5	10	12	14	20	30	40	50	60	80	120	140	160	200
u(x)	0,6	0,35	0,2	0,02	0,54	1,22	1,46	1,44	1,35	1,12	0,8	0,7	0,6	0,5

In the diagram, these resistances occur (approximately) when the speed of particle 1 is from 14 units. up to 45 units At such a speed of movement of particle 1, an increase in its speed along the X axis causes an increase in the speed of particles 1 and 2 along the Z axis. At the speed of particle 1 greater than 45 units. (approximately) there is a decrease in the interaction between particle 1 and particle 2. This is expressed in the form of their decreasing velocities along the Z axis. In other words, the resistance of particle 2 to the movement of particle 1 decreases.

The functioning of the law of negligible action

The law of negligible action presented here operates in two types of phenomena.
One type of phenomena is related to particles that move linearly in relation to an object at enormous speeds. One particle moving at great speed and the particles of matter in relation to which it is moving have a negligible impact on each other. This situation exists in two known phenomena. One of them is the movement of particles accelerated to enormous speeds in a particle accelerator. There, particles move in a vacuum, but they overcome the inhibiting influence of the surrounding matter of the accelerator itself and the matter of the physical vacuum, which is not an absolute vacuum.
Another example of linear motion is the neutrino. Neutrinos reach us at enormous speed from space, but they are also thrown into space during the decay of atoms of radioactive elements on Earth. Thanks to their enormous speed, in accordance with the law of negligible action, they penetrate deep into the Earth.

The parameters of particles that are accelerated to high speeds in accelerators are currently misinterpreted by theoretical physicists. This is related to the incorrect understanding and interpretation of concepts such as energy and mass. The incorrect formula E=m*c^2 has been used in physics for almost one hundred and twenty years. Based on it, theoretical physicists currently wrongly believe that the energy used in accelerators to accelerate particles turns into the mass of these particles. They believe that this is the reason for the increasing difficulties in the process of accelerating particles that are moving at higher and higher speeds. And the actual state of affairs is that when it becomes more and more difficult to accelerate a particle in accelerators, when its speed increases, this is the result of the accelerator's decreasing ability to influence the particle.

The second type of phenomena in which the law of negligible action manifests itself is related to the vibrating motion of particles of matter.
The discovery in this field was made by prof. Louis Rancourt, a physicist at College Boreal, Canada. He called his discovery the Boreal effect.
In one of his experiments, prof. Rancourt used two masses - 100 g and 500 g. He placed the smaller mass on a torsion scale, and the larger mass was placed near the smaller mass. After stabilizing the position of the smaller mass (mounted on a scale) relative to the larger mass, the researcher passed a beam of laser light (in another experiment, it was a beam of ordinary light) through the space between both masses. The result was that the smaller mass moved closer to the larger one.

In another experiment, the researcher did not use the impact of a larger mass on a smaller one, but only had a torsion scale and a 100 g weight suspended on it. In this experiment, he transmitted a beam of light through a space not far from the weight, for example, from the north side. Under the influence of the light beam, the weight moved northwards, i.e. it moved closer to the light beam. And when light passed near the weight from the south, the weight deflected to the south.

The experiments were carried out in different conditions, including in the basement. In each case, in different places in the basement, or in different places in the laboratory, the torsion balance arm with the mass attached was set in different directions. The direction was decided by the location of the closest large masses of matter - walls, equipment, etc. And in each experiment it was so that simultaneously with the light beam being turned on, the mass attached to the torsion balance lever approached the light beam, and when the light beam was turned off, the lever with the mass returned to its original position.

To explain the Boreal effect, the interpretation proposed by the discoverer is not recommended. Because even if we use the concept of pressure difference to explain the physical mechanism of the Boreal effect, it does not mean that this mechanism is related to the gravitational interaction. Because in fact, today's theoretical physics does not know the mechanism of gravity. Currently, this mechanism - of gravity itself, as well as the Boreal effect - can be logically explained only on the basis of ideas that are contained in the constructive

field theory (CFT).*3)
You can read more about the Boreal effect in the article "The Boreal effect - Law of insignificant action".*1)

In fact, the Boreal effect manifests the law of negligible action, which is related to the vibrating motion of particles of matter. Particles of matter carry light radiation. Vibrating at high frequency, they move at high speed. As a result, they significantly reduce the interaction with particles of matter from the surroundings. Thanks to this, the balance in the interactions between particles of matter is destroyed. And when, after the appearance of a light ray, a nearby object begins to move, it is, in a sense, an attempt of the components of matter to create a state of equilibrium in the newly created situation.

The Boreal effect indicates that a vacuum, i.e. space without atoms, is filled with particles of subtle matter. In this vacuum, light waves propagate in a similar way to how sound waves propagate, for example, in air. Particles of subtle matter, the existence of which is confirmed by the results of the physical experiments of Prof. Louis Rancourt, in the constructive field theory (CFT) they were called protoelectrons.

The final conclusions

The presentation of the law of negligible action presented here is a challenge to theoretical physicists. This call is intended to encourage theoretical physicists to take action to correct theoretical physics.

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*1) "The Boreal effect - Law of insignificant action" - http://pinopa.narod.ru/Effect_Boreal_uk.pdf.
*2) "Perihelion motion of Mercury" - http://pinopa.narod.ru/Ruch_peryhelium_uk.pdf.
*3) "The Constructive Field Theory - briefly and step by step" - http://pinopa.narod.ru/KTP_uk.pdf.

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