



Inverse Temperature Dependence of Gravitational and Inertial Forces. Schemes and Comments

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Abstract

The proposed article is a development of the topic of gravity, namely, the mechanism of the inverse temperature dependence of gravitational forces is considered. Gravitational forces are considered as a reaction to external influence, external influence is the expansion of the Universe. All interaction schemes are built on the basis of the laws of classical mechanics of Newton and the planetary model of the structure of the Rutherford atom. The basis of all constructions is the gyroscopic effect of electron rotation. The schemes do not take into account the gyroscopic effect of rotation of other elementary particles of the atomic structure. This effect is conventionally presented in the gyroscopic effect of electron rotation. The inverse temperature dependence of gravitational forces together with the second law of thermodynamics form the appearance of the Universe. The second law of thermodynamics can be called in other words the "Law of cooling of matter". An assumption is made about the gravitational component in the processes of condensation and evaporation.



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Introduction

The proposed article is a development of the direction presented in the articles.^{1,2,3} Gravitational forces, inertial forces are presented in this direction as reaction forces to external influence. For gravitational forces, the external influence is the expansion of the Universe, for inertial forces, the external as such is taken on the object. The reaction mechanism is absolutely identical and has an inverse temperature dependence. The

inverse temperature dependence is that when heated, the forces of gravity and inertia decrease, and when cooled, they increase. The proposed article is not intended to analyze and criticize existing views on the nature of gravity and is in no way connected with these views. On the other hand, the vision of the nature of gravity is completely built on the concepts of classical Newtonian physics, has such continuity.

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Main Part Schemes

In brief, the nature of gravity forces: "Gravity is the combined reaction of the gyroscopic forces of electron rotation to the external effect of the expansion of the Universe." The expansion of the Universe is original, constant, ubiquitous, isotropic. Accordingly, the reaction (gravity) is original, constant, ubiquitous, isotropic.^{1,2} To understand the nature of gravity, it is also necessary to constantly keep in mind that the main property of a gyroscope is the desire to maintain its original position. To understand the nature of gravity, the original position of all things was originally a certain common clot of matter. Since all things are currently in the expansion phase, the reaction (gravity) resists this expansion, creating the effect of mutual attraction of all things.

The nature of gravity and inertia forces is absolutely identical. The assertion of the inverse temperature

dependence of gravity forces equally applies to inertia forces.³ Conducting physical experiments on the inverse temperature dependence of gravity forces under terrestrial conditions is very difficult, since the Earth's component in the gravitational force is significantly greater than any object for measurement when the temperature changes. We cannot change the Earth's temperature. Experiments on the temperature dependence of inertia forces under terrestrial conditions are quite accessible. Experiments conducted show the existence of such a dependence.⁴

Fig. 1 shows a diagram of the influence of temperature on the reaction forces (gravity) from external influence. For gravitational forces, the external influence is the expansion of the Universe, for inertial forces - the external influence as such.

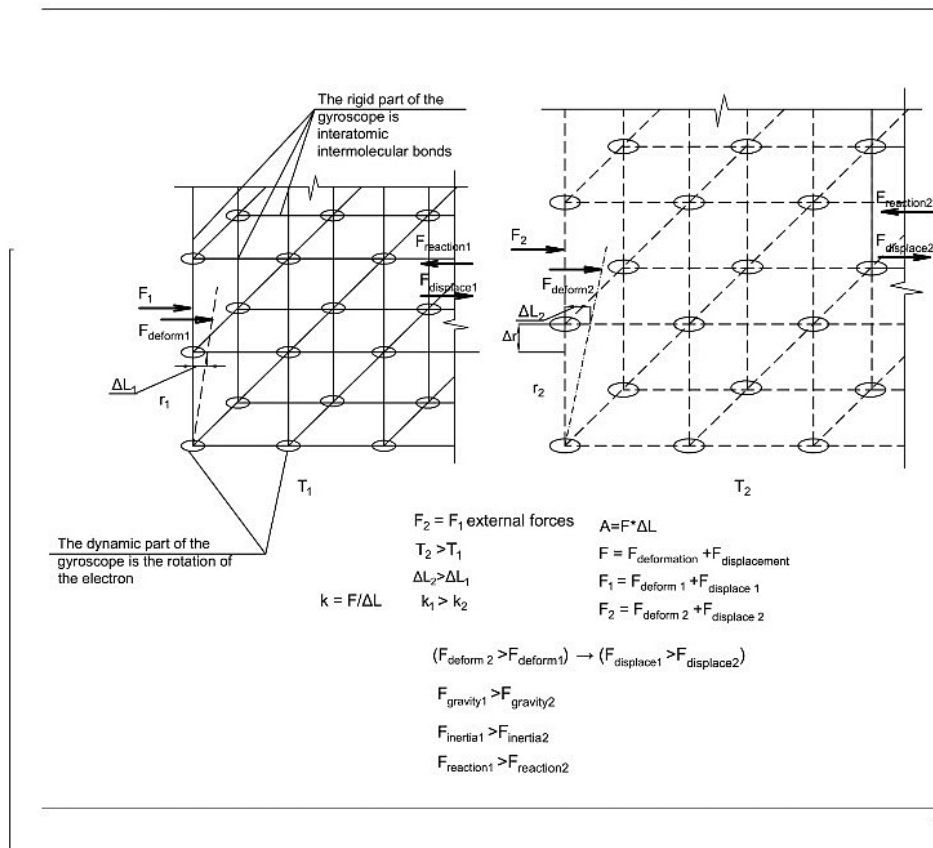


Fig. 1: Scheme of formation of inverse temperature dependence.

Temperature impact on any body leads to a change in the density of the substance. For example, when heated, the density decreases with increasing temperature. The decrease in density can be explained by an increase in the distance "r" in interatomic or intermolecular bonds. An increase in the distance "r" leads to a decrease in the rigidity "k" of the lattice, the lattice of interatomic or intermolecular bonds. The basis of the scheme is the design of the gyroscope. The gyroscope has a dynamic part - the rotation of the electron and a static (rigid) part - interatomic or intermolecular bonds. Under external influence, the static part of the gyroscope, the body itself, is the first to receive disturbance. The static part of the gyroscope does not create a response.

The response is created by the dynamic part of the gyroscope at the moment when it receives disturbance from the static part of the gyroscope. The dynamic part, by the property of the gyroscope, creates a reaction, this reaction is transmitted in reverse to the static part. That is, the reaction of the dynamic part is transmitted to the lattice of interatomic or intermolecular bonds. The distribution of the reaction from an external action depends on the rigidity of the lattice. The rigidity of the lattice determines the share of energy that goes to the deformation of the lattice and the share that goes to the reaction in the form of a response force (gravitational force, inertial force). The only difference between gravitational forces and inertial forces is that the external action for gravitational forces is constant, and for inertial forces, the external action is point-like and of a short-term nature, part of the external action returns in the form of "inertial" forces, a continuation of a certain action.^{4,5} This effect is also explained by the gyroscopic effect, the tendency of the gyroscope to maintain its original position, which can change over time, but has its effect. A decrease in lattice rigidity with increasing temperature occurs due to an increase in the distance between the bond nodes, the centers of interatomic or intermolecular bonds. Rigidity decreases proportionally to the square of the distance (r^2). Interatomic and intermolecular bonds are of electromagnetic nature.

A clear example is the dynamics of a boiled and raw chicken egg. The dynamics of a boiled egg corresponds to temperature T_1 , the dynamics of a raw egg corresponds to temperature T_2 .

Fig. 2 shows the inverse temperature dependence of the lattice rigidity of interatomic or intermolecular bonds. The lattice rigidity distributes forces, creates a relationship between the deformation processes and the response processes. The greater the rigidity, the greater the portion of energy spent on the response (gravitational force, inertial force). Fig. 2 shows an increase in lattice rigidity due to an increase in the rotation speed of the gyroscope. This increase is shown by a linear dependence. A decrease in lattice rigidity due to interatomic and intermolecular bonds has a quadratic dependence. The resulting rigidity decreases under the influence of the quadratic dependence of interatomic bonds.

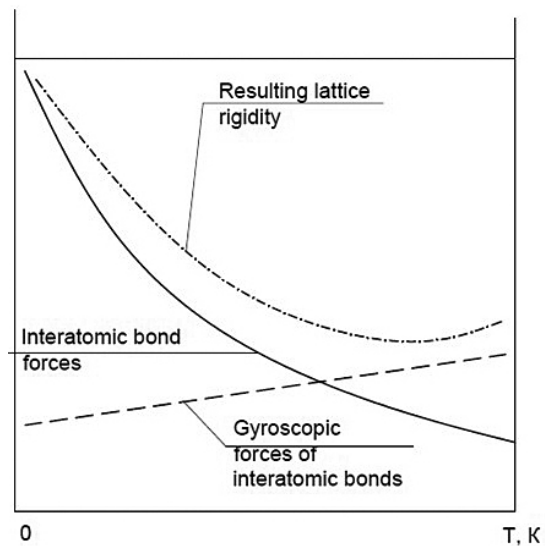


Fig. 2: Schematic diagram of the inverse temperature dependence of lattice rigidity

In the formation of the appearance of the Universe, the action of the inverse temperature dependence of the forces of gravity and the second law of thermodynamics plays a huge role. The second law of thermodynamics can be called in other words the "Law of cooling of matter". When matter cools, the forces of gravity increase. If this effect did not exist in nature, then matter would be a homogeneous amorphous mass. Due to this effect, galaxies, stars, and planets are formed. Stars and planets acquire a spherical shape. On Earth, examples of this phenomenon can be the formation of clouds in the sky, the formation and fall of rain, condensation processes, and evaporation processes.

Comments

As noted earlier, the proposed hypothesis of gravity's physics is based on the concepts of classical physics, Newtonian mechanics. The hypothesis does not offer any inventions, conventions, or assumptions. The hypothesis is based on the complete identity of inertial and gravitational forces. Moreover, gravitational forces are presented as a derivative of inertial forces. The hypothesis excludes the existence of gravitational forces as such, existing separately. The term "gravitational forces" is used in the text of the hypothesis, since this is a generally accepted idea. The division of the terms "gravitational forces" and "inertial forces" is conditional, the physics of these forces is identical. The presented diagrams show the mechanism of the inverse temperature dependence of gravitational forces and inertial forces.

As a commentary and illustration, it is proposed to consider the mechanism of a natural phenomenon - an explosion. When an artist draws the phenomenon of an explosion, a scattering of matter, we see the resulting vectors of the scattering of matter in the form of fragments of matter flying in different directions. If an observer is inside the explosion, he will not be able to determine a certain resulting vector. For this observer, the explosion, the expansion of matter will be isotropic. Anisotropy can occur in those places where the dynamics of the explosion, expansion will meet resistance. For the Universe, any material object is a point, the expansion as a whole is isotropic for a point. Actually, the appearance, formation of a material object is associated with the inverse temperature dependence of the forces of inertia (gravity) and the second law of thermodynamics - a dual process. The use of the term "anisotropy" is local in nature, only as a reaction, a manifestation of gravity.

So, at some point in the Universe, there was an explosion, or some similar phenomenon. As a result of this explosion, the process of expansion of the matter of the Universe began, an isotropic process. The explosion can be considered as a one-time process, and the subsequent expansion as a long-term process. The expansion of the Universe can be imagined as the action of inertial forces after the action of the initial impulse. These forces are considered as external forces in the emergence of gravitational forces, reaction forces. Here we can

repeat that the action in conjunction with the inverse temperature dependence of gravitational forces and the second law of thermodynamics form the appearance of the Universe - galaxies (disk-shaped, arms), spherical shape of stars, planets, etc. Without this phenomenon, the Universe would be a homogeneous amorphous mass. This phenomenon is the basis of the processes of separation of matter, condensation and evaporation.

The Quadratic Dependence of the Forces of Gravity

The quadratic dependence of gravitational forces on the distance between objects is presented in the article.⁶ It is necessary to explain the quadratic dependence of the forces of gravity on the distance between objects. We are talking about " r^2 " in the expression $F = \gamma (m_1 \cdot m_2 / r^2)$. Practical calculations show full compliance with the reality of this basic formula for calculating the forces of gravity. Accordingly, we can confidently assert the existence of a quadratic dependence of the gravitational forces on the distance " r " between objects.

So, in the scheme of formation of gravitational forces, we have the rotation of electrons that create gyroscopic forces, these gyroscopes are enclosed in an interatomic lattice, to which the cumulative reaction of gyroscopic forces is transmitted. As noted above, the rigidity of the interatomic lattice depends on the temperature of the object. For almost all physical phenomena related to gravity on Earth, the temperature dependence can be neglected. This dependence can be neglected, since the mass of the Earth is very much larger than any object on Earth and the temperature of the Earth is almost constant. But, using the example of temperature dependence, it should be noted that the forces of gravity depend on the rigidity of the interatomic (and intermolecular) lattice. It can also be assumed that the rigidity of the interatomic lattice depends on the magnetic interaction.

The magnetic interaction arises from the rotation of electrons. The rotation of electrons, in addition to gyroscopic forces, induces a magnetic field, a cumulative magnetic field. The multidirection of the induced magnetic fields of electrons for an object gives a zero resultant field. But for the rigidity of the interatomic lattice, these fields matter, respectively, the amplification of these fields increases this rigidity,

and vice versa. The interaction of magnetic fields between objects is determined by Coulomb's Law. In turn, according to Coulomb's Law, the magnetic interaction has a quadratic dependence on the distance between objects, or $F = k(q_1 \cdot q_2 / r^2)$. In other words, the rigidity of the interatomic lattice also has a quadratic dependence on the distance between objects, and, accordingly, the gravitational forces have a quadratic dependence on the distance between objects. In other words, it is necessary to introduce the concept of the magnetic field of a conglomerate. This conglomerate has a resultant vector of magnetic fields equal to "zero", but each individual field of this conglomerate has a value. If the conglomerates have resultant magnetic field vectors other than "zero", then the forces of magnetic interaction with the corresponding vector sum will be added to the gravitational forces.

Now it is appropriate to recall the scheme of formation of gravitational forces, which lies in the structure of atoms and molecules. Yes, the rotation of an electron can be represented as a moving part of an atom, whereas the atom itself, the lattice of atoms, can be represented as a fixed, rigid part of the structure. Force gyroscopic effects are transmitted through this rigid part, and vice versa. If, for example, we assume that the forces of gravity have a direct dependence on the rigidity of the interatomic (intermolecular) lattice, then they have a quadratic dependence on the distance between objects.

Materials and Methods

A series of articles on the topic of gravity were adopted as source materials for compiling the article. In these articles,¹⁻⁵ gravity is presented as a force absolutely identical to the forces of inertia. The forces of inertia are the forces of reaction to external influence. For the forces of gravity, the external influence is the forces of expansion of the Universe. For inertia forces, the external impact is such.

The proposed article is a development of the topic of gravity. The dynamic processes that are considered in this article find their real reflection in the kinematics of the movement of celestial objects.

Results

The proposed series of articles,¹⁻⁵ including this article, is a separate concept on the theory of gravity and

inertia. Naturally, this concept rejects all existing versions on this topic. The concept is based on the concepts of classical Newtonian physics. The concept does not use any "innovative" assumptions, postulates, conventions.

Discussion

At this stage, the main task is to put forward a hypothesis for discussion in the scientific community. The publication of an article is the first stage in organizing a discussion. A preliminary discussion on Internet forums is also possible.

For example, I raised this question on Russian and English-language physics forums - an explanation of the physics of gravity using the concepts of Newton's classical physics. I did not receive any attempts to refute it.

It should also be noted that Einstein's theory of relativity is being harshly criticized on these forums. Naturally, I also took part in this discussion.

Such forums are useful because they form a collective opinion, and the author has the opportunity to openly express his point of view. It is also possible to openly receive critical comments from colleagues.

Conclusion

The main conclusion of the article is that in nature there is an inverse temperature dependence of gravitational forces. The article presents the mechanism of this dependence. At the same time, the mechanism of the gravitational forces themselves is presented, as a reaction to the external influence of the expansion of the Universe. At the same time, the identity of the work of gravitational forces and inertial forces is presented. Along the way, it is possible to formulate a definition of gravitational forces as inertial forces, for which the external influence is the expansion of the Universe.

It should also be noted that the phenomenon of the inverse temperature dependence of gravitational forces is not reflected in any of the existing theories of gravity. This article reflects this phenomenon and presents a mechanical scheme of this phenomenon.

It can also be suggested that the change in density depending on temperature has a gravitational

component. The very fact of the expansion of the Universe is a manifestation of inertial forces, a manifestation of impulse from some initial explosion, a reaction to this impulse. In turn, gravity is a reaction to these inertial forces.

This point should be considered in more detail. As a model of this process, we can take the ballistics of the flight of an artillery shell. The only difference between the flight of a shell and the process of expansion of matter is that an artillery shell has a direction vector, and the expansion of matter is isotropic. As a model, an artillery shell is taken, its dynamics have phases of dynamics similar to the expansion of matter. Namely, the explosion phase, the phase of flight "by inertia" (the phase of receiving the initial impulse, the phase of flight "by inertia"). The forces of inertia are omnipresent, in the presented processes they act as an accumulator - in the first phase they are charged with energy, in the second phase they give up energy. This point is true both for the flight of a shell and for the expansion of the Universe. In the Universe, at the present time, we are in the phase of expansion, the release of energy. This release is manifested in the forces of "gravity" - inertia. Here a question may arise - how is the origin of inertial forces from the explosion linked with the same forces causing the reaction (gravity), especially since the same gyroscopes act as a mechanism (gyroscopic effects from the rotation of electrons)? There is no contradiction in this - the gyroscope will react to an external impact, to several impacts with a resulting vector, in our case, the vector of gravitational forces. In the formation of the resulting vector of gravitational forces, it is also necessary to note other points. On the scale of the Universe, there is an expansion process, on the scale of the Galaxy, a compression process, i.e. this is a dual process. There is no contradiction in these processes. The model of these processes is the stroke of an oar on water, in which a vortex is formed. Again, in all processes, the main property of the gyroscope is manifested - the desire to maintain the original position, to return to the original position.

An article is currently being prepared for publication, which will present a diagram of a closed thermodynamic cycle of transformation of matter in the Universe. This will be a closed thermodynamic cycle of the Carnot cycle type. This cycle will be based on adiabatic processes of compression and expansion

of matter. The main role in these processes is played by the action of the inverse temperature dependence of the forces of gravity and the second law of thermodynamics. In other words, the life cycle of the Universe is presented as a thermodynamic cycle of matter, as a continuous process. Here it is necessary to clarify that the processes occur in different places of matter in different phases. The process of boiling water in a saucepan can serve as a model. When water boils in a saucepan, evaporation and condensation processes occur simultaneously, but in different places in space. Moreover, it is likely that what we call the Universe is only the visible part of the Multiverse,⁷ i.e. the Universe with a visible and invisible part. The invisible part (dark matter) is the material objects of the Multiverse that move relative to us at a superluminal speed.

The matter of the Universe is in constant motion. There are no absolute speeds and absolute rest in nature. These physical concepts are relative.

The article touches upon the topic of the gravitational component in the processes of changing the density of matter from temperature. The phenomenon of changing the density of matter does not contradict the phenomenon of changing gravitational forces from temperature. There are no contradictions in the temperature dependences of gravity forces, matter density and lattice rigidity of interatomic and intermolecular bonds. It is quite natural that denser matter has a more rigid lattice of bonds. The model of matter in the form of a gyroscope structure - a dynamic part and a static part - implies a constant confrontation between these parts. The dynamic part influences the static part and vice versa. This confrontation can be presented as a philosophical concept of the unity and struggle of opposites. The result of this struggle, as stated above, is the formation of a resulting vector of forces, the forces of the combined reaction (gravitational forces).

Again, a question may arise here. It was said earlier that the expansion of the Universe is initial, constant, ubiquitous, isotropic. Accordingly, the reaction (gravity) is initial, constant, ubiquitous, isotropic. A question may arise about isotropy. Isotropy implies obtaining a resultant vector equal to "0". Here we must not forget about the main property of the gyroscope - the tendency to the initial position. The initial position for all matter is its total initial

mass. Accordingly, according to the property of the gyroscope, mass will tend to mass. Accordingly, the resultant vector will be directed from mass to mass, from matter to matter. This is indirect evidence that everything that exists has a common origin.

The proposed article aims to form a new direction in the study of the nature of gravity. Here it is necessary to clarify an important point. In modern science, the word "new" is taken literally. In this article, the word "new" means previously unstudied, but based on existing knowledge. The hypothesis is based on the concepts of classical Newtonian physics. This approach has always been a priority in science.⁸ There is no need to invent all sorts of fictions if a phenomenon can be explained on the basis of fundamental science. In modern science, a fashion for all sorts of fictions has formed.

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Informed Consent Statement

This study did not involve human participants, and therefore, informed consent was not required.

Author Contributions

The sole author was responsible for the conceptualization, methodology, data collection, analysis, writing, and final approval of the manuscript.

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Not applicable

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