THE LAW OF CONTINUITY OF THE UNIVERSE (HYPOTHETICAL THEORY)

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Abstract. *This paper presents the results of a hypothetical theory of the gravitational field. Using thermodynamic and statistical methods, we derive an expression for the spectral density of graviton radiation. We demonstrate that the source of gravitational radiation is elementary particles, i.e., any substance consisting of such particles. Additionally, we show that the quantity in the expression for the spectral density of gravitational radiation at the graviton frequency is proportional to the mass of the elementary particle and the pseudovector of the angular frequency. The latter is apparently related to the spin of elementary particles. Finally, a brief description of the operating principle of a biologically matrix signal converter is presented to provide a basis for experimentally confirming the hypothetical theory.*

Keywords: *graviton, gravitational field, graviton frequency, graviton energy, Heisenberg uncertainty principle, biologically matrix signal converter.*

Introduction

In nature, there are two types of fields: electromagnetic and gravitational. The electromagnetic field exhibits three types of interactions: strong, weak, and electromagnetic. In contrast, the gravitational field only exhibits gravitational interaction. The quantum theory of the electromagnetic field is fully developed and has been fully confirmed by experiments. However, despite numerous scientific studies, the quantum theory of the gravitational field remains unresolved, although its properties are satisfactorily formulated.

This paper presents the results of a new, hypothetical approach to creating a quantum theory of the gravitational field.

Theory

It is well known that only charged elementary particles are sources of electromagnetic radiation. In contrast, all types of elementary particles, including charged ones, are sources of gravitational radiation. Predominant electron transitions from one energy state to another in the atomic shell, as well as transitions involving other charged elementary particles in the atomic nucleus, contribute to the emission and absorption of electromagnetic radiation quanta. However, the emission and absorption of gravitational field quanta predominantly occur in the atomic nucleus.

Thus, the source of graviton emission and absorption is the entire statistical ensemble of elementary particles within an atom's nucleus, as well as the electrons within its shell. The discrete energy states of this ensemble naturally obey Boltzmann's law. The probability of these oscillators being in a state with energy $n \cdot w_G$ at a thermodynamic temperature T is equal to

$$w_G = C \cdot exp\,[-n \cdot w_G/kT], \qquad (1)$$

where $w_G = \mathcal{H}\nu_G$ is the graviton energy; $\mathcal{H}$ is Khaydarov's constant; $\nu_G = m/(\omega_G \cdot r \cdot T_G)$ is the graviton frequency; m is the mass of the elementary particle and graviton source; ω_G is the pseudovector of the angular velocity of the elementary particle and graviton source; r is the

pseudo radius of the elementary particle and graviton source; and T_G is the period of the gravitational wave, and C has the following value from the normalization condition.

$$C = 1/\{\sum_{n=0}^{\infty} exp\,[-n \cdot w_G/kT]\}. \quad (2)$$

Furthermore, by carrying out all the mathematical transformations that Max Planck used in his reasoning [47], but with respect to the gravitational field, we obtain the following expression for the spectral density of graviton wave energy radiation:

$$R_G^0 = \frac{2\pi \nu_G^2 w_G}{[V^2\, exp\, w_G/(kT)]-1}, \quad (3)$$

here, V is the propagation velocity of the gravitational wave, ν_G is its frequency, and w_G is its energy. Here, we assume that the gravitational field quantum is predominantly emitted during the transformation of elementary particles into each other within the atomic nucleus – that is, between the excited and unexcited states of the latter. In this case, nucleons and elementary particles exchange quantized positions, which facilitates the emission of the gravitational field quantum. It is now established that the electromagnetic field quantum is predominantly emitted between the excited and unexcited states of the atom, i.e., between the energy states of electrons.

Perhaps this is an accurate representation of electromagnetic and gravitational radiation from substances that comprise the matter of the universe. If so, it may be possible to unify these two theories with quantized radiation inherent in both.

We would like to call this law the “Law of Continuity of the Universe.”

Discussion of Theoretical Results and Conclusions

The hypothetical quantum theory of the gravitational field employs two previously unknown quantities: First, graviton energy is expressed as $w_G = \mathcal{H}\nu_G$, where $\mathcal{H}$ is the Khaydarov constant. Second, this constant was calculated based on the work of the “Biological Matrix Signal Converter,” which we have used for over 15 years. Preliminary calculations show that the Khaydarov constant is $\mathcal{H} \sim 10^{-51}$ with the dimension L^3T^{-2}]. The graviton frequency is $\nu_G = m/\lambda_G = m/(\omega_G \cdot r \cdot T_G)$, and its dimension is $[ML^{-1}]$, where λ_G is the gravitational wavelength.

Thus, as expected, the dimension of graviton energy is $[w_G] = \mathcal{H}\nu_G = [ML^2T^{-2}]$.

However, the wavelength and frequency of the graviton field cannot be identified using the same parameters as those of an electromagnetic wave. While the frequency of an electromagnetic wave relates to electrons' transitions between energy states, the graviton frequency relates to nucleons' and elementary particles' transformations in an atom's nucleus.

Additionally, the graviton wavelength appears to be related to the pseudovector of angular velocity and the pseudoradius of elementary particles over time. Therefore, in the expression $\nu_G = m/\lambda_G = m/(\omega_G \cdot r \cdot T_G)$, the real quantities are the gravitational wave period T_G and the elementary particle mass m.

Before continuing the discussion of our hypothetical theory, we will cite some excerpts from an article by three great 20th-century scientists: Albert Einstein, Boris Podolsky, and Nathan Rosen (EPR) [48].

“In a complete theory, each element of reality corresponds to a specific element.” For a physical quantity to be considered real, it must be possible to predict it with certainty without disturbing the system.” In quantum mechanics, when two physical quantities are described by non-commuting operators, knowing one excludes knowing the other. This implies that either (1) the wave function description of reality in quantum mechanics is incomplete or (2) the two quantities cannot exist simultaneously."

When considering making predictions about a system based on measurements made on another system with which it has interacted, one concludes that if (1) is false, then (2) must also be false. Therefore, the wave function description of reality must be incomplete.

Now, let us briefly summarize Werner Heisenberg's work, On the Intuitive Content of Quantum-Theoretical Kinematics and Mechanics [49]. This work provides precise definitions of terms such as “location,” “velocity,” and “energy” (e.g., those of an electron), which remain valid in quantum mechanics. Heisenberg also demonstrates that canonically conjugate quantities can be defined simultaneously, albeit with characteristic imprecision. This imprecision is the actual cause of the statistical relations in quantum mechanics. Dirac-Jordan theory mathematically formulates this concept. Based on these principles, Heisenberg demonstrates how macroscopic processes can be understood within the framework of quantum mechanics. To clarify the theory, the author discusses some special thought experiments.

Einstein and his co-authors claimed to have proven the logical incompatibility of quantum mechanics and contradictions. However, the theory's most bizarre predictions were revealed by objections.

Without delving further into the details of the objections to Heisenberg's uncertainty principle, we find the following line of reasoning appropriate. To derive the uncertainty expression, Heisenberg imagined an electromagnetic wave quantum being emitted while the atom remained in an excited state for 10^{-8} seconds. After this time, the atom emits a photon, resulting in the formation of spectral lines or wave trains. The width of the wave train is $\Delta\omega >> 1/\tau$, and the photon travels a distance of $\Delta x = c\cdot\tau$ during this time. Considering that $\Delta\omega = \Delta k\cdot c$ and $\Delta k = \Delta p/h$, we can derive the following expression, now known as Heisenberg’s uncertainty principle:

$$\Delta x \Delta p >> h. \qquad (4)$$

We object to the idea that this relationship can be fully interpreted outside the context of an electromagnetic field. A photon is indeed emitted from an atom in real time within a linear dimension Δx and with a real momentum Δp. Subsequently, although its momentum is known, its location is completely unknown. However, images of the universe obtained using the James Webb telescope refute these seemingly true facts. The telescope emits a packet of photons over more than 13 billion years, which are recorded. This means the momentum (Δp) and coordinates (Δx) of the photons are known within the telescope. This reasoning can also apparently be applied to gravitons and, even more so, to particles. Information obtained using a unique device dubbed the “Biologically Matrix Converter of Signals (Biocons)” indicates that elementary particles in the packet of information do not disappear. On the contrary, their coordinates and momenta remain known during signal processing. Through experimentation, we obtained the following empirical formula for calculating the amount of processed information:

$$I = I_0 \exp\left(\frac{w_G}{kT}\right) = C_{\mathcal{H}} P^4 \exp\left(\frac{w_G}{kT}\right), \qquad (5)$$

where I_0 is the initial information (signal) emitted from the Biocons in the form of elementary particles, $C_{\mathcal{H}}$ is the proportionality coefficient depending on the individual biological structure of the Biocons, k is the Boltzmann constant, T is the thermodynamic temperature, $w_G = \mathcal{H}\nu_G$ is the energy of a quantum of the gravitational field, ν_G is the frequency of the gravitational field, and $\mathcal{H}$ is the Khaydarov constant. P is the pressure in the Biocons during processing of the initial information. The EPR discussed hidden quantities. Perhaps the hidden quantity is the graviton frequency that we used, as well as the associated graviton energy represented as

$$w_G = \mathcal{H}\nu_G. \qquad (6)$$

We would like to note that this expression, used in formulas (1) and (5), was obtained based on our 2011 work with biocons.

In addition to these considerations, we will address the questionable nature of the ultimate velocity, as expressed by Einstein. Taking his doubts into account, we can assume that in our formula (6) for the gravitational field frequency,

$$\nu_G = m/\lambda_G = m/(\omega_G \cdot r \cdot T), \quad (7)$$

the value of the pseudovector of angular velocity, ω_G, will be the actual angular velocity vector.

This implies that the linear velocity, $U = \omega_G \cdot r$, can have any value and that elementary particles rotate around their axes. Furthermore, given the linear dimensions of the universe, it is impossible to obtain information based on the operation of biocons in real time. This is our argument in favor of the EPR idea.

Such devices require a combination of two types of objects that operate on different principles: electronic devices and biological cages.

Here, we will provide information on the operating principle of a biological matrix signal converter:

First, digital signals are formed in living cells; therefore, the term "biospintronic" is pertinent here.

Second, digital signals are created by charged elementary particles, specifically electrons and positrons.

Third, electrons (electron streams) are apparently accelerated to high speeds by a magnetic field, such as that of the Earth, the galaxy, or the system of galaxies.

Fourth, charged particles spontaneously transition to a neutral state in relation to charge, apparently becoming neutrinos at a super-high speed.

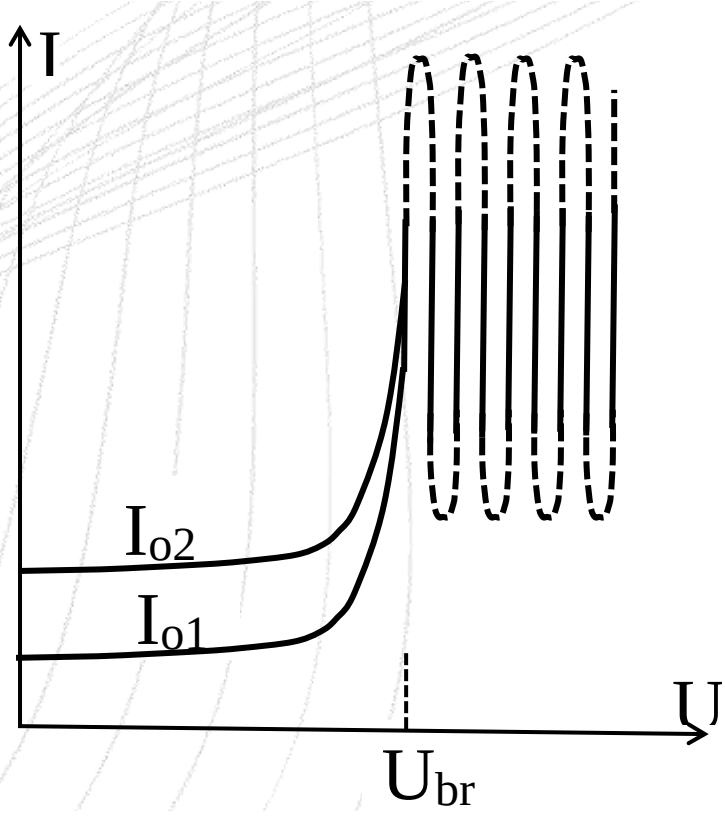
Fifth, neutral elementary particles (digital signals) are registered by living cells.

Experiments show that radiating signals consist of charged particles. Upon receiving a signal, acknowledgment that a charging stream is present is not given.

Moreover, if the accepted signal consisted of charged elementary particles, the existence of biocons would be impossible.

The empirical formula (5) provides a picture that corresponds to the experimental results. We can conclude that the stream of particles bearing information within the boundary speed $\boldsymbol{U_{br}}$ and beyond not only “takes” information from the universe, but is also ready to transfer its own biocons.

Thanks to the biocons, we



Analytical dependence of the amount of information in relative units on the speed of distribution of the information packet for its different initial values I0 in biocons.

received information from the universe in five minutes. However, before sending the initial information $\boldsymbol{I_0}$, lengthy preparation is required for critical pressure $\boldsymbol{P}$, at which the information flow begins. We have collected a huge amount of information about the universe and all its spheres, from the time of the "big bang" to the present, including human civilization.

The empirical formula (5) gives us the following picture resulted in drawing that corresponds to experimental results. It is possible to draw a conclusion that the stream of particles bearing information within boundary speed $\boldsymbol{U_{br}}$ and further not only "takes" information in the Universe, but also are ready to transfer information own biocons. Thanks to works biocons we received information from the Universe within 5 minutes. However, before sending the initial information $\boldsymbol{I_0}$, a necessary lengthy preparation (procedure) is required for the critical pressure $\boldsymbol{P}$, at which the information flow is launched. At us on hands the huge information, lives of the Universe concerning on all spheres has collected, beginning from times of "the big explosion" up to now including a human civilization.

Summary

In summary, we can say that humanity has entered a new era of scientific and technological progress based on artificial intelligence, both on Earth and on a universal scale.

We will witness this firsthand when we build a biocons analog in the near future. Unlike in 2008–2011, when we worked with biocons, we discussed these materials with artificial intelligence for an extended period and received its approval. However, we do not consider this approval to be final.

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