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Scalar Field in Model of the Universe with Minimal Initial Entropy

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Abstract: *Starting from earlier developed by author model of origin of the Universe with minimal initial entropy, in this paper we consider properties of Scalar Field, which is responsible for the creation of matter in all layers of the fiberspace of Super-Universe. It allows to explain all the known processes occurring in the Microcosm and the Macrocosm of our Universe. It is shown that the Field generates all known fields in the Universe. The presence of the mass of elementary particles is provided by an influence of the Field, acting constantly in the Universe. The Field is characterized by high degree of symmetry in a multidimensional space, as well as two states with positive and negative energy. The integrity of the Universe provides an instant transfer of information and mutual "affection" of the particles within the total Universe, which is provided by the properties of the fiberspace and the Field.The latter sets a discreteness of time in our Universe time (time quant* $\Delta t_o = 7.36 \cdot 10^{-85} s$*). The interaction of between particle and the corresponding antiparticle through the Field leads to the formation of Vacuum Particle. A World of Field-time is an inexhaustible source of energy that can be used by mankind.*

Keywords: *Scalar Field, Super-Universe, quant of time, vacuum particles, source of energy.*

In Ref. [1] the author has proposed a model of the origin of our Universe with a minimal initial entropy on the basis of the Law of similarity and Law of unity. According to this model, our Universe is a part of the Super-Universe. Moreover, the Super-Universe is represented by a fiberspace [2], and the adjacent layers differ by a space dimension of space per unit. All layers of afiberspace expand over time with the speed of light. The standard three-dimensional space (four-dimensional (3+1) Universe) is adjacent to the two-dimensional space (World 3) of quarks [3,4]. Similarly, the two-dimensional space borders with a one-dimensional space (World 2) of diones. Finally, the one-dimensional space borders with a zero-dimensional space (the World-1) of a scalar Field-time. Between the adjacent spaces there exists an information interaction through a single delocalized point. Filling of the fiber bundle by an energy starts with a World-1. Then the spaces of higher dimensions are filled, each in turn. The energy entered the World-2 has an ability to create particles of the World-2. Similarly, the energy, entered the World-3 and World-4, has the **ability to create** of **quarks and bineutrons** in the vicinity of atomic nuclei respectively. An important characteristics of these groups is the absence of charges(colored, electric, magnetic) and magnetic moments.

In contrast to the Standard model of origin of Universe [5-9] from singularity with infinitely large density of matter and infinitely high temperature, and therefore infinitely large entropy, the model proposed of origin of the Universe provides the lowest possible value of entropy, the cold initial state and the limited density of a matter. In the proposed model a zero-dimensional space of Field-time could interact with other spaces and determine a program of evolution of the Universe.In this paper, we consider properties of a Field, which are able to explain all possible processes occurring in a Microcosm and a Macrocosm of the World-4.

SCALAR FIELD

"In 1921T. Kaluza had", published the article in which he proposed a method of unification of the gravitational and electromagnetic interaction (general theory of relativity and Maxwell's theory of electromagnetic field) on the basis of the hypothesis according to which our world can be represented as a curved five-dimensional space-time. However, as for four-dimensional space-time one supposes that one coordinate is temporal, and four of them are dimensional [10,11].

In this case, we write for five-dimensional interval[1]

$$dI^2 = G_{AB} dx^A dx^B, \tag{1}$$

Where the indexes *A* and *B* run the values of 0, 1, 2, 3, 5 (4 is intentionally omitted). Now components of the G tensor can be written in the form of a matrix

$$G = \begin{pmatrix} G_{00} & G_{01} & G_{02} & G_{03} & G_{05} \\ G_{10} & G_{11} & G_{12} & G_{13} & G_{15} \\ G_{20} & G_{21} & G_{22} & G_{23} & G_{25} \\ G_{30} & G_{31} & G_{32} & G_{33} & G_{35} \\ G_{50} & G_{51} & G_{52} & G_{53} & G_{55} \end{pmatrix} \equiv \begin{pmatrix} G_{\alpha\beta} & G_{\alpha 5} \\ G_{5\beta} & G_{55} \end{pmatrix} = \begin{pmatrix} g_{\alpha\beta} & A_\alpha \\ A_\beta & G_{55} \end{pmatrix} \tag{2}$$

In this formula, the Greek indices α and β run four values: 0, 1, 2, 3. The *G* tensor is symmetric one and therefore it has only 15 different components. Here 10 components correspond to a tensor of the Einstein's general theory of relativity, four components correspond to components of the electromagnetic vector potential A_α ($G_{5\alpha} = 2A_\alpha\sqrt{\gamma}/c^2$, where γ is the gravitational constant in the Newton's formula) and additional component G_{55} is unknown. From the structure of the *G* matrix it follows that the component G_{55} correspond to unknown Scalar Field.

Therefore, the Kaluza's theory requires an existence of additional Scalar Field and corresponding interaction. Considering the matrix (2), it can be argued that both gravitational and electromagnetic fields manifest in Microcosm and Macrocosm and the unknown Scalar Field should manifest in Microcosm and Macrocosm. Common for these fields is the dependence of their intensity on a distance. The electromagnetic field is much stronger than the gravitational one and it mostly manifests in the structure of atoms and molecules and in the interaction between charges. Most likely, **exactly** a **Scalar Field which is always present in the Universe is responsible** for an **existence of mass** (mass–scalar quantity)[2] **of elementary particles**. As a mass of elementary particles does not depend on coordinates in Metagalaxy, the effect of a Scalar Field is the same throughout the Universe. Moreover, it can be even stated that a **Scalar Field forms the Universe**. Therefore, one could identify a Scalar Field with Field of World-1 of the Kaluza's theory [1]. From the expression (2) one could make the conclusion that a Scalar Field creates other fields and provides an origin of matter, existence of life and evolution of the Universe.

Earlier it has been stated that a World-1 is zero-dimensional. However, it should be noted that not all possible coordinates in a World-1 are disclosed, they are closed to themselves in a ring of the small radius. In fact, **the local symmetry of a Field can be spherical in multidimensional space**. A Field of high symmetry has an ability to generate spaces and particles with lower symmetry. In addition, a World-2 and a World-3 have the cylindrical symmetry, and a World-4 allows all possible symmetries, including the spherical symmetry in three-dimensional space, so that an additional information is injected from a World-1 into a World-4 [1].

VACUUM PARTICLES

The formation of the most important modern physics concepts of physical vacuum (PV) is very difficult process. During two thousand years it is believed that a space is filled by pervasive ether. In the twentieth century the ether was replaced by an absolute emptiness. However, for explaining different phenomena (amendment to magnetic moment of the electron, a shift of the hydrogen atom fine structure, etc.) there are introduced such concepts as "vacuum amendments." Currently, PV is considered as the lowest state of quantum fields. At the present time, the different attempts are continuing to impart to PVs more and more not explained, but tightly postulated properties. It is

[1] In theoretical physics it is usually accepted not to write a sign of summation, and assumed that it exists, if the indices in the formula are repeated.

[2] The theorists believe that the mass of elementary particles are generated due to their interaction with the Higgs scalar boson field (*Peter Ware Higgs)*. Quantum mechanics has the hard rule: states with the same symmetry can interact among themselves. So, could the Higgs boson, **the probability of an existence of which in the Universe is equal zero**, provide an existence of the mass of all possible particles (both bosons and leptons, both scalar and vector particles)?

stated, for example, that the real particles can be obtained from the empty PV by acting particle creation operator on PV. Any hint on the mechanism of this process is absent [12]. This is understandable, because four known types of physical interactions cannot explain the processes linked with the PV nature.

In the [12] it has been firstly proposed the following hypothesis about the PV nature and structure: **while annihilating particle-antiparticle pair they are not eliminated, but combined into a system which is called by an elementary vacuum particle** (EVP). At EVP in the unexcited state in our laboratory space all quantum numbers are equal zero. According to Ref. [12], the PV basis is a proton-antiproton (p^+p^-) vacuum. The concentration of EVP in this type of vacuum is equal to $1{,}54541 \cdot 10^{39}$ см$^{-3}$ while concentration of the electron-positron vacuum EPV is equal to $1{,}73009 \cdot 10^{29}$см$^{-3}$, that is at 10 orders smaller. In all, nine kinds of physical vacuum, including neutrino-antineutrino vacuum, is counted in Ref. [12]. However, the reasons and mechanisms of the particle-antiparticle pair transformation into EVP vacuum are not analyzed in [12].

Let us take the approach given in [12] as basis to describe the PV. In this regard it is interesting to consider a nature of the particles annihilation. The electrostatic or gravitational interaction cannot explain this phenomenon. Especially it concerns the annihilation of neutrino with the corresponding antineutrino. The Coulomb interaction between electron and positron is able only to describe creation of the positronium atom, which is observed in experiments.

Therefore, one can conclude that a creation of vacuum particle from the particle-antiparticle pair with zeroth distance between them requires another type of interaction. In all cases, the vacuum particle is scalar. Therefore, we can conclude that namely a ***Scalar*** **Field creates vacuum particles**. Consequently, **one of the properties of a Scalar Field is its participance in the creation of vacuum particles**. In fact vacuum particles are closed for an external influence. Vacuum particle should be polarized for converting the vacuum particles into pair of real particles. If this is pair of charged particles (electron-positron, quark-antiquark), then polarization occurs in the Coulomb field of atomic nuclei and transformation of this virtual pair into pair of free charged particles is possible because of the polarized vacuum particle excitation by the electromagnetic radiation quantum of ($h\nu \geq 2mc^2$). Such a process is permitted as it is permitted an inverse process, namely, emission of photons under the particle-antiparticle annihilation.

On the other hand, annihilation occurs when particle interact with the corresponding antiparticle, regardless of an electric charge, spin, and mass. This fact confirms that namely a Field is responsible for an annihilation process. As a Field is able to create the particles with definite mass, a statement about a possibility of annihilation (disappearance of mass and other physical characteristics) of a particle with its antiparticle must be truthful.

Thus, the interaction between the particle and its antiparticle with the participation of a Field can reduce the distance between them to zero, and the energy of interaction will be equal $2mc^2$.

It should be taken for the fact that EVPin the World-3 is created according to the same mechanism, where interaction occurs between quarks and antiquarks.

A possibility of Field participance in the processes of annihilation requires that **all the particles and their antiparticles are carriers of interactions through a Field**. Thus, **atomic nuclei are simultaneously carriers of Scalar Field. O**therwise in their neighborhood it would be impossible creation of a pair or group of neutron pairs as it is required by the model of origin and evolution of the Universe [1]. Moreover, strictly identical contribution of a Field corresponds to the same masses of protons. In this case, the VPs, created on the basis of neutrinos, will be polarized **with the participation of a Field** in a vicinity **of nuclei**. Excitation of these polarized particles by the Scalar Field leads to possibility of particles pair creation by neutrino and antineutrino. In this regard one can mention the author's (Ref. [12]) belief that excitation u of the VP, created on the basis of the neutrino-antineutrino pair, is responsible for the background radiation, known as the cosmic microwave background radiation of the Universe[3].

[3] The author of this paper has another concept regarding a nature of the cosmic microwave background radiation [23].

It is worth to pay attention to another opportunity, namely, **a Field-induced excitation of EVP into states whose energy is less than $2mc^2$**. This possibility is essentially to describe interaction between particles with participation of virtual bosons. At the same time the energy states of virtual bosons must lie below the energy states of the same bosons in a free state and, in addition, they must lie above the EVP states. Besides, an energy state of virtual boson must be as lower, as bigger its mass in a free state.

Considering processes of origin and evolution of the Universe, the author [1] has introduced the reaction of creation of the bineutrons in a vicinity of the existing atomic nuclei. Therefore, Field has an ability to create bineutrons or bineutrons clusters in a vicinity of particles that are carriers of the same Field. However, a mechanism of the matter creation in the Universe at the beginning (the first millisecond) of its evolution is different from mentioned ones.

The matter is in the fact that there was absent a matter in the first moments of the Universe origin. However, the Universe was born and began to expand with a constant rate. In order the Universe began to be filled by matter, it is necessary that since its origin all possible vacuum particles were constantly present in it. Under a small initial volume of the Universe a Field's density of energy, that entered into the Universe, was extremely high. In this case, Field was able to excite all the possible particle-antiparticle pairs, and then, bineutrons and their clusters were created in a vicinity of the formed particles. In this process a contribution of antiparticles to the creation of a matter quickly decreased to zero as the competing processes became quickly and steadily more intense. Now Field is also able to create the particle-antiparticle pairs from a vacuum, but the concentration of these particles decreases with time inversely proportionally to cube of lifetime of the Universe. This is extremely small quantity in comparison with concentration of the created bineutrons in a field of atomic nuclei.

TIME DISCRETENESS OF IN THE SOLITARY UNIVERSE

Earlier, the author had attempted to describe the discreteness of time on the basis of the Law of unity in the Universe [13]. In this attempt the Universe was treated in the traditional sense. Based on the postulate of time discreteness, it was clear that unity in the Universe could be achieved while the **simultaneous** existence of all particles of Metagalaxy. This was possible only under condition that signal of unity would cover the total Universe for the period of time discreteness. This discreteness period can be determined by the formula

$$\Delta t = \frac{h}{M_U c^2} \tag{3}$$

Where M_U - mass of matter in the Universe.

To find these settings, some certain axioms were introduced in Ref. [13]. In particular, there were considered available in the literature numerous historical and geological data (beginning from Plato and Pythagoras to modern theories of civilizations and lithological plates). These data indicate that the Earth is in a field that is described by the dodecahedron (icosahedron) symmetry. Thus, t**he symmetry of the dodecahedron (in the local approximation) should describe the physics of the Universe.** Our usual three-dimensional space corresponds to the symmetry of the cube three edges of which at the top correspond to three spatial coordinates. Respectively, the rectangular facet corresponds to four dimensions. Accordingly, **the symmetry of the dodecahedron indicates on existence of three spatial coordinates** (three edges at the top) **and five dimensions** (pentagonal facet).

It turned out that the dodecahedron group (I_h) allows the existence of two one-dimensional (H_{1g}, H_{1u}), four three-dimensional (H_{2g}, H_{2u}, H_{3g}, H_{3u}), two four-dimensional (H_{4g}, H_{4u}) and two five-dimensional (H_{5g}, H_{5u}) images (subspaces).

The number and symmetry of representations of the I_h group gave the reason to believe [13] that there are 4 types of matters: matter (mass m), antimatter (anti-mass $\tilde{m}$) negative-matter (negative-mass $\overline{m}$) and anti-negative-matter (anti-negative-mass $\tilde{\overline{m}}$). The value of m and $\tilde{m}$ are positive values, and $\overline{m}$ and $\tilde{\overline{m}}$ are negative ones. Then, the total symmetry of the Universe in respect of mass will be ensured. As negative energy of free particles corresponds to negative mass, it provides symmetry of the world regarding to energy and temperature.

To describe the time discreteness and an instant distribution of interaction in our time-space, author of the Ref.[13] has proposed to add additional time dimension (besides of the usual time *t* it was introduced another time coordinate τ, which is orthogonal to *t*). It was assumed that the carrier of such an interaction is the gravitational field with its quanta - graviton. Introduction of two time coordinates leas to the fact that we have de Sitter's space of type II (space of anti-de-Sitter [14] with signature of 1, 1, -1, -1, -1).

Further the material Universe is represented as being made up of three components (*m*, $\overline{m}$ and *m*), separated by intervals of time $\Delta t/2$, where Δt is quantum of time. In this case, the total mass is equal *m*.

Graviton seems like the double vortex, which has mass *m* and negative-mass $\overline{m}$.

There is interaction between a mass, which corresponds to the time *t* = 0, and graviton, which is in the past regarding to the matter (actually vortex $\overline{m}$ is absorbed and vortex *m* erodes a function of the element of mass *m* in time). The graviton motion along the closed time coordinates τensures its full absorption by mass *m*. This absorption causes the pair (*m*, $\overline{m}$) disappearance and instead of this symmetrically with respect to the third element *m* there is a new pair ($\overline{m}$, *m*) with time coordinates 3 $\Delta t/2$ ($\overline{m}$) i 2Δt (*m*), and also a new graviton, shifted regarding the first graviton in time on Δt.The process is repeated indefinitely.

One should note that mass must have the structure ($\overline{m}$, *m*, $\overline{m}$) in accordance to the model for the time current *t* in the opposite direction.

This consideration gives the value of the time discreteness $\Delta t \approx 10^{-103}$ c. To ensure the unity of the Universe speed of information transfer should have the order of $\sim 1 \cdot 10^{131}$m/c.

This discrepancy of received result and the speed of light was overcome only in the new model of the Universe, as part of the fiber Super-Universe [1].

It is interesting to pay attention on the information received on the basis of analysis of the spacecraft WMAP a year after the publication of the article [10]. This information allowed to the authors of the papers [15-17] hypothesize that the Universe is a space dodecahedronical space of Poincare.

If there was no world unity, then the graviton, emitted by an elementary particle, could interact only with the same particle, as other elementary particles would exist at other time points. This would lead to a lack of gravitational interaction and, consequently, to the disappearance or impossibility of existence of the material world. Therefore, unity is absolutely necessary and it is provided in the total Universe **by the mutual affection of all identical elementary particles**. Actually, for this they need their identity. The mutual affection of particles in the Universe is possible only with instantaneous transfer of information in all space of the Universe. This possibility exists in the fiber Super-Universe.

SYNCHRONIZATION AND UNITY IN THE SUPER-UNIVERSE. QUANTUM OF TIME

Now let us consider the fact that our Super-Universe is fiber on the different dimensions Worlds, and our Universe is a brane of four-dimensional space [1].

One can assume that synchronization processes in the World-4 would occur from the center of four-dimensional space, which is a brane of the World-4. However, such a synchronization will occur with a delay, equal to the time of reaching the signal from the four-dimensional center space to three-dimensional surface.

Considering the fiber Super-Universe, we notice significantly more powerful effects that can be successfully used not only for synchronization of the matter motion in discrete time, but for **instantaneous transmission of information between arbitrary points of the World-4**.

We have already mentioned that the connection between the layers of the fiber space occurs only in one point, and this point delocalized is in each of the adjacent layers. As information is transferred from the point, this means that information from every part of the World-4 at the same time will be transmitted to every part of the World-3. Then, this information will be transmitted to the World-2 and, finally, to the World-1, and World of Time-Field that has no extension in space. In addition, information from the World-3 can be transmitted in the arbitrary World-4.

As the World of Time-Field interacts directly with all points of our Universe, the information in it may come from every point of our space.

Thus, it is consequentially to conclude that **synchronization and Unity of the World-4 may be provided directly from the Field**, which sends the directives down to the hierarchical stairs.

Let us note that the matter supplies from the Field in all layers of the fiber space at constant speed. In this case, the matter supplies to the World-4 occurs with speed *dM/dt* = 5000 solar masses per second [1]. Therefore, it is consequentially to assume that this mass will determine time discreteness (quantum of time):

$$\Delta t_0 = \frac{h}{Mc^2} = \frac{6.626 \cdot 10^{-34}}{1 \cdot 10^{34} \cdot 9 \cdot 10^{16}} = 7.36 \cdot 10^{-85} sec. \quad (4)$$

This value is greater than the value, determined in Ref. [13] on 17 orders, but less time Strap for 41 orders.

We determined time discreteness in our space, however, the Field sets it, more precisely, it sets its oscillation. If time discreteness is equal to the period of the Field oscillations, the frequency of these oscillation is:

$$v_0 = \Delta t_0^{-1} = 1.36 \cdot 10^{84} sec^{-1}. \quad (5)$$

One should make one more amendment. The matter is at once created in all the layers of the fiber Super-Universe. It means that time discreteness step (4) is reduced in about three times ($2.45 \cdot 10^{-85} c$), and frequency (5) of the Field oscillations is increased by similar times ($4.08 \cdot 10^{84} c^{-1}$).

In order the scheme, which explains the time discreteness [13], would be valid, it needs to take energy and negative energy instead of mass and negative-mass. Thus, the Field is characterized by two states: with positive and negative energy.

While filling the World-1 by the Field, graviton[4] motion occurs along the coordinates of τ. Since a point has zeroth dimension, the graviton will be able to cover the Field at the time, which does not exceed the value Δt_0 for arbitrary graviton speed. Moreover, it is logical to assume that the graviton moves along the closed path; it means that the axis τ is rolled into the ring with duration Δt_0.

Now it is easy to understand the manifestation of all identical particles unity in the Universe: it is provided by interaction between layers of the fiber Super-Universe space, particularly between the Field and the World-4, as well as between the particles of the World 4 and the World-3.

A mutual affection between identical particles lead to the fact that every elementary particle with certain phase of their existence function will be presented in every moment of discrete time. For example, the function of particles existence with mass m_i can be described by expression $\psi_i = a \cdot \exp(-i\omega_i t)$, where $\omega_i = 2\pi/\Delta t_i$, $a = c \cdot \sqrt{m_i}/h$ is the normalization factor, $\Delta t_i = h/(m_i c^2)$. In this case, the oscillation period Δt_i is filled by the periods of the Super-Universe oscillations, that is $\Delta t_i = N_i \Delta t_0$, where $N_i = M/m_i$ - integer.

THE HIERARCHY STRUCTURE OF THE UNIVERSE

Above we mentioned about hierarchical levels in the structure of the Universe and the Super-Universe. In this regard it is necessary to mention that the hierarchical structure of the Universe is sufficiently described in papers [17-19]. It is interesting to note that in this case the mechanism of interaction between elements of the given level corresponds to every separated hierarchical level in the Universe. Particularly, the weak interaction corresponds to the level of elementary particles, strong interaction – to the structure of barions (including nucleons) and atomic nuclei, electro-magnetic interaction – to the structure of atoms, molecules and systems of interacting particles, and at last, the gravitational interaction – to the structure of planetary and stellar systems etc. Also it is necessary to say, that the structuring of the Universe structure is completely caused by the action of the Field, which makes it's field contribution to each member of the Universe hierarchy and determines its structuring.

INSTANT TRANSFER OF INFORMATION IN THE WORLD-4

Analysis of the scientific literature has shown that there is information about experimental data, which was not notices by the experts up to this time. For example, speech is about data, obtained by Kozyrev

[4] In this case, it is a conventional name.

[21,22]. These data indicate on the possibility of instantaneous transfer of information about the coordinates of distant stars. In fact, N. Kozyrev has shown the reality of Minkowski's four-dimensional geometry (Fig. 1).

In Figure 1 it is shown one spatial coordinate and time coordinate t. The point O is the position of the observer. Points 1, 2 and 3 denote the positions of the stars in the remote past, at the present time, and in the future. The rays at an angle to the coordinate system show the path of the electromagnetic wave. A quantum of light emitted by the star at point 1, runs to laboratory coordinate system (the point O). This ray is observed visually or by using the telescope. N. Kozyrev used the reflecting telescope in the focal plane of which the sensor was put. It was shown that in this case besides of the star visible image two additional images of the same star are registered by the sensor. It was proved by the numerous experiments that the sensor registered information (entropy). It is important to note that the sensor registers the information even in the case when the nontransparent for electromagnetic waves plate is placed on the way of the light ray. Thus, there are no barriers for a flow of information.

N. Kozyrev concluded that the information could be disseminated from the star 1) from the past with the speed of light, 2) from present moment of time, and also 3) from the future along with light ray in the opposite direction (Fig.1). When using a telescope-refractor there is only one optical image of the star. Consequently, the flow of entropy (information) can be reflected from a mirror, like light ray. The lens is not capable to focus a flow of an entropy.

As the visible positions of stars on the celestial sphere which corresponds to their position at the moment of light emission, are simultaneously observed, then the comparison of these results allowed to N. Kozyrev to obtain important information about a parallax of stars. In its turn this fact shows that information can be transmitted over long distances without delay.

Thus, the fiber space can provide an instant transfer of information through informational link between the World-4 and the World-3, and the links **between the World-4 and the World-1.**

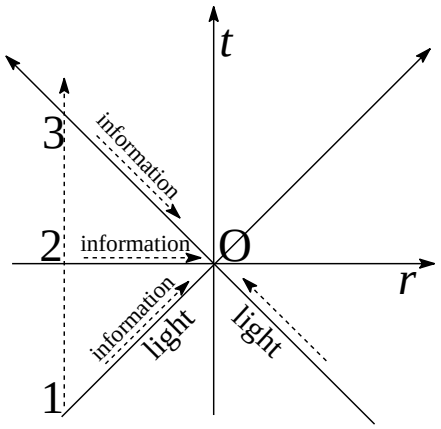

Fig1. *Four- dimensional Minkowski's geometry*

The transfer of information in the negative time direction is possible only with the participation of the Field as **the Field can carry both positive and negative energies**, and hence, transfer information along time coordinate in both directions.

The transfer of information into any point of our Universe by using of the Field properties and fiber Super-Universe is **the basis for developing a instant space communication between arbitrary points of the Universe, to carrying out methods of observation for processes in the distant space objects at any moment of time.**

At the present time this problem is of a great interest due to the fact that the space laboratories are already flying around the Solar system. It is already clear that the source of information might have an entropy nature. Narrow beam for transmission and receiving information is formed by the use of the paraboloid mirror. In this case, the direction of information distribution, and possibly information receiver, is provided by informational interaction between the particles of the World-4 and the World-3 under participation of the World-1.

INEXHAUSTIBLE SOURCE OF ENERGY

As it follows from a consideration of the Field properties, the World "Time-Field" is inexhaustible source of energy. **In future humanity should use a flow of energy from the Field – an**

inexhaustible source of a pure energy. It can be the secondary energy of Field that is accumulated in the bowels of the Earth, the Sun, and the Universe (in particular, an energy of excited vacuum by Field). In principle it is possible carrying out direct use of Field's energy.

Permanent creation of matter due to an energy of Field leads to that the total energy of the Earth bowels increases. It provides an inexhaustible prospects of the energy utilization of the Earth's bowels to produce energy. For example, speech is about converting water, which is supplied through pipes to a large enough depth, to the water vapor under high pressure and its using for electricity generation and human settlements providing by hot water.

CONCLUSIONS

In the paper it is proposed the model of Time-Field with using the Law of unity in the Universe. It is shown that:

1) Symmetry of dodecahedra indicates on the presence of three spatial and two time-dimensions (the space of anti-de-Sitter) in the World-1.
2) Field is characterized by a high symmetry in the multidimensional space, as well as two states: **with positive and negative energy**. Only in this case it will set time discreteness.
3) The integrity of the Universe can only provide an instant transfer of information within the total Universe. In the model of isolated Universe a rate of transferring data should be extremely large. In model of fiber space all rates of information transferring with participation of the Field must be the same and equal to speed of light in vacuum. In this case, **the integrity of the Universe provides the Field property from the World-1**.
4) The mutual affection of the particles in the Universe occurs with the participation of the Field from World-1 and space of quarks. Such affection will lead to the description of the particles as oscillations with the period $\Delta t_i = h/m_i c^2$. This fact explains the nature of the wave properties of particles.
5) Field specifies the time discreteness in our Universe – $\Delta t_o = 7.36 \cdot 10^{-85}$s (oscillation frequency of the Field $1.36 \cdot 10^{84}$ s^{-1}). The boson responsible for discrete time moves on the closed trajectory along the axis of the second time; the second time collapses in the ring with duration Δt_0. The speed of the boson does not exceed the light speed.
6) Field provides the appearance of masses of the elementary particles.
7) Field has an ability to create the bineutrons or bineutrons clusters in the vicinity of existing particles and atomic nuclei in the World-4.
8) A particle and its antiparticle can create a vacuum particle due to the interaction through the Field. The Field can excite a vacuum particle and provide formation of pair of the real particles from it, and may also cause an excitation of vacuum particleto the state, whose energy is less than the energy of free particles pair. Therefore, the Field creates pair of virtual particles. All material particles are able to interact through the Field.
9) **Perspective conclusion**: transfer of information into any point of our Universe by using of the Field properties and fiber Super-Universe is **the basis for developing a instant space communication between arbitrary points of the Universe, to carrying out methods of observation for processes in the distant space objects at any moment of time.**
10) Time-Field World is inexhaustible source of energy. **In the future humanity should only use a flow of energy from the Field**. It can be the secondary energy of Field that is accumulated in the bowels of the Earth, the Sun, and the Universe (in particular, an energy of excited vacuum by Field). In principle it is possible carrying out direct use of Field's energy.

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