

# **The Byuon Theory, New Non-Gauge Interaction and the New Method in Order to Obtain an Electric Energy**

**Yu. A. Baurov**

“Byuon Space Energy Corporation” LLC, 353900, Krasnodarskiy region, Novorossiysk town, Engelsa 80.

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**Abstract:** *The basic ideas of an unconventional physical model of creation of the observed physical space and ultimate particles from a finite set of special discrete objects (byuons) are presented and discussed. The qualitative distinctions between the theory of byuons and previous physical theories are discussed. Predictions of theory of byuons are proposed: the existence of the cosmological vectorial potential  $A_g$ , a novel fundamental vectorial constant defining the global anisotropy of physical space and a new non-gauge force of nature. The results of experimental investigations of new non-gauge interaction (using high current magnets, torsion and piezoresonance balances, the rate changes of  $\beta$ -decay of radioactive elements, etc.) and astrophysical observations are described. It was shown the construction of electric generator using the byuon energy and the new non-gauge force for obtaining of the electricity.*

**Keywords:** *Theory of Byuon, non-gauge force, new electricity*

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## **1. INTRODUCTION**

Nowadays the development of our civilization is going to the natural limit because oil, gas, nuclear fuel etc. have limits and diminish with very high speed. Therefore our life requires new physical ideas of creation which can point out new methods in order to receive electric and heat energy.

Many years author of this article work out a new non-gauge physical theory. Let me introduce basic theses of this theory.

It is known that any novel physical model of the Universe must meet the following criteria. First, all the discovered laws of nature as well as sufficiently well established models of one or another physical phenomena must follow from the new model as asymptotical approximations. Second, the new theory should have the capability for prediction. That is, it should guide an experimental way to the gain of new knowledge, as the theory itself gives nothing but only points such a way. Criterion of truth is an accurately performed experiment independently confirmed by various authors. The TB [1-3] seems to meet the above criteria. That is a theory of “life” of special discrete objects from which the surrounding space and the world of elementary particles form. The intrinsic dynamics of byuons determines such fundamental phenomena as the course of time, rotation of planets and stars, spins of elementary particles, asf.

What is a qualitative distinction between the theory of byuons and previous physical theories? In this brochure we will not consider in detail present-day physical conceptions. The structure of space and time, physical sense of these fundamental notions and their properties (for example, global anisotropy), as well as physics of elementary particles in that the mentioned notions may deviate from the accepted standards, are dealt with in a great many works, from antiquity (Aristoteles [4], Euclidean “Principia”, Democritean “world’s tiny bricks”) to authors of twentieth century and authors of today. Only a short review of published works on physics of elementary particles could occupy an all article. Therefore we advise the reader to acquaint himself if only with three monographs [5-7]. In the first of them, a physical and philosophic comprehension on hundreds of works on the questions above is given. The second, an original book of the known soviet physicist D.I. Blokhintsev, describes difficulties in creating a modern theory of space, and especially of the world of elementary particles. The third work represents the proceedings of “The seminar on studying time phenomenon”, at Moscow Lomonosov State University, under the direction of A.P.Levich, which conceptually develop a conception of N.A. Kozyrev, another famous soviet physicist, about “flow of time” and connection between the notions of time and energy [8].

But return to the above stated question.

First, the physical space was always given in all the science, in one way or another, and motion equations for a system of objects under study were written in that space. Space could be uniform continuum (Newton, Minkovsky) or discrete, one-dimensional or multidimensional, asf. In present-day cosmologic models of the Universe origin (Gamov's Big Bang [9], Linde's model of bulging Universe [10], and so on), space is always given, too. But in the theory of byuons, the physical space (necessarily three-dimensional one, not ten-or-more-dimensional as in modern physical models) is a special quantized medium arising as the result of interaction of byuon's vacuum states (VSs) (It is a dark matter, see below). That is, space is not given but arises. Therewith the appearing three-dimensional space originated must have an insignificant global anisotropy, as distinct from all basic isotropic models with the same properties in various directions. The said anisotropy denotes the existence of some chosen direction caused by the existence, in nature, of a new fundamental vectorial constant, the cosmological vector-potential  $A_g$  entering into the definition of the byuon. That new constant is associated with the prediction of a novel anisotropic interaction of natural objects between themselves and with the physical space and the physical vacuum, a lowest energy state of physical fields.

It should be noted that in the literature spaces with local rather than global anisotropy, are considered [11], for example, the Finsler's space-time [12], but the local anisotropy is given therein "by hand", as the saying goes. That is, an author himself directly introduces it into his model instead of obtaining from some general principle. For example, there are domain models of the Universe.

Secondly, the physical sense of time notion is not yet revealed in science in the present state of the art [7]. The general philosophic concept of time as a form of matter existence, which form expresses the order of change of objects and phenomena as a sequence of events, does not indicate a common nature of those events. As a rule, people tie their time to a particular periodic process: rotation of the Earth around its axis, Earth's orbiting around the Sun, oscillations of a quartz system, asf, without becoming aware of inner, profound sense of time. Standard physical time references, for example, quantum or, what is the same, atomic clock with instrument error on the level of  $10^{-11}$  per year and moderate resolution on the order of  $10^{-13}$  seconds, give us no possibility of approaching the knowledge of time essence. The byuon theory reveals physical essence of time as a discrete sequence of changes in the byuon's "length", its quantum number. A possibility therewith arises, to synchronize clocks at great distances comparable with dimensions of our Metagalaxy, due to the quantum process of physical space formation from the byuon's vacuum states (VSs). That possibility substantially distinguishes the theory of byuon's from A. Einstein's special theory of relativity (STR), in which clocks can be synchronized only when a signal has passed between them with speed of light  $C$ . It should be noted at once that in the byuon theory, material objects cannot move with a speed faster than the light speed (that is similar to the STR's postulate on finite propagation velocity of interactions), but synchronization of clocks occurs by a quantum way without introducing the concept of speed. That is, some object originated in the course of interaction between byuon vacuum states and forming the physical space, is at a time in two spatial regions being very distant from each other in the three-dimensional space arising.

Third, an essential distinction of the byuon theory from modern models in the classical and quantum field theories [13] is that the potentials of physical fields (gravitational, electromagnetic, asf.) become, in the theory of byuons, exactly fixable, measurable values. Recall to the reader that ordinary methods of measurement are capable to measure solely a difference of potentials. Therefore, in the existing field theory, potentials are defined only with a precision of an arbitrary constant or the rate of change of the potentials in space or time. But in the theory of byuons, field potentials become single-valued since there are formed, on the set of byuon VSs, field charge numbers which generate the fields themselves, as, for example, the electric charge of an electron generates an electric field. The physical sense of field as a special form of matter, loses its basic meaning because all the observable events can be described on the basis of the byuon theory without introducing the concept of force, and hence of field.

An important methodic distinction between the byuon model and all those existent in the theoretical physics of today, is that the latter use images with properties of real objects, - for example, strings in the physics of elementary particles [14], superstrings, membranes when creating a unified field theory [15], asf. The byuons but are unobservable objects having no analogues in the nature though all the natural objects appear in the result of interaction of byuon VSs.

Having explained the distinctive peculiarities of the byuon theory, notice that in this article, results of some fundamental experiments in support of the basic theoretical statements will be shown. There will be also given some results of a run of applied investigations opening up entirely new horizons as to further development of our civilization in the areas of power engineering and information. Quite an inexhaustible source of power associated with the energy of the observable physical space and physical space of elementary particles, is opening up. That energy is two orders of magnitude greater than all the energy stored in substance of our Universe. Peculiar “cocks” to gain new energy are elementary particles because their masses (part of mass), by the byuon theory, are proportional to the modulus of some summary potential  $\mathbf{A}_\Sigma$  that contains potentials of all known fields.  $\mathbf{A}_\Sigma$  cannot be larger than the modulus of  $\mathbf{A}_g$ . The definition of vector  $\mathbf{A}_g$  direction is a basic purpose of my experimental works (global anisotropy of physical space). In an early stage of outlining the byuon theory, we will use such notions as field and force in order that the reader could easily understand what the questions. By that potentials, we can affect the process of forming, from VSs of byuon, certain mass portion of elementary particles associated with formation of their geometric space, with probability close to 1, and gain energy according to the known A. Einstein’s formula  $E= mc^2$ . Thus, a new interaction of objects with physical vacuum arises, which interaction forces substance out of a region with weakened summary potential.

After reading the article the reader will know how new space vehicles using the new force as tractive force, should look; how one can, by that vehicles, pioneer interstellar distances resisting the execution of this task on the basis of the reactive principle; how the byuon theory makes it possible to explain many previously inexplicable astrophysical phenomena etc..

As is seen from the above said, “encroachments” of the byuon theory are considerably brighter as compared to a standard aim of physicists to unify all the known interactions. Therefore I hope the article would be interesting not only for mature and young physicists, which could further develop the present-day statements of the byuon theory and its applications, but for engineers interested in new thoughts in physics and, for example, a construction of electric generator using the byuon energy and new non-gauge force for obtaining of electricity. Note that the practice of byuon energy using in heat installation was show in [16].

## 2. BASIC POSTULATES OF THE BYUON THEORY

Any theory begins with axioms, that is, with basic postulates accepted without proof. Thus, let us assume that there are no space, no time, no world of elementary particles from which all surrounding us physical bodies consist, but there is a mathematical object, a byuon  $\Phi(i)$ , being unobservable in itself and characterized by discrete states (i.e. numbered by the series of natural numbers) having inherent “vectorial” property. The expression for  $\Phi(i)$  is

$$\Phi(i) = \begin{cases} [\mathbf{A}_g x(i)], \\ -\sqrt{-1}[\mathbf{A}_g x(i)] \end{cases} \quad (1)$$

where  $x(i)$  is “length” of the byuon, a real (positive or negative) value depending on the index  $i = 0, 1, 2, \dots, k, \dots$ . Index  $i$  is a quantum number for  $\Phi(i)$ <sup>1</sup>. Quantum number is a “face” of an object, that is, a value that characterizes just that same its state in question but not another (for example, “smiling” or “frowning”). The value  $\mathbf{A}_g$  is some inner potential equal, in magnitude, to the cosmological vector-potential  $\mathbf{A}_g$ , a novel fundamental vectorial constant introduced by the author in Refs. [17,18]. It is not an ordinary potential of any field theory since we have yet no notions of field and its potential. We have to do with a special property of the byuon that we call therefore the inner byuon potential. The dimensionality of  $x(i)$  is that of distance, so we will measure  $x(i)$  in centimeters (cm), and  $\mathbf{A}_g$  in Gauss centimeter ( $\mathbf{A}_g \approx 1.95 \cdot 10^{11}$  Gs·cm). That is, our fundamental object is dimensional. That was presumed by many authors which searched for so called “universum” [19] (that thing from which all the other things are built up), since the real world cannot be constructed from the dimensionless 0 and 1. But the question of dimensionality of that object remained an enigma. Our object, the byuon, has

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<sup>1</sup> It should be explained that the vector  $\Phi(i)$  is not an ordinary vector in some space but an object with “inner” vectorial properties that are manifesting themselves when the value  $x(i)$  changes in the process of physical space formation.

dimensionality of  $G_s \times cm^2$ , as also have (in CGSE-system) such physical objects as electric charge, magnetic flux, and Dirak's monopole [20]-a hypothetic object not yet detected in experiments.

The value  $\Phi(i)$  is, by definition, real or truly imaginary.

The entire set of states  $\Phi(i)$  can form a one-dimensional space  $R_1$  relative to index  $i$ . In  $R_1$ , the distance between byuon states (in scientific language, the metrix) is defined as the difference of their "lengths", i.e. between quantities  $x(i)$ . Such a metrix is known as Archimedean metrix.

Explain the above said. If, for example, the object  $\Phi(i)$  has, in one of its states, an enormous magnitude of  $x(i)$  equal to  $10^{28}cm$ , and in its another state,  $x(i+k)$  is equal to that same enormous magnitude of  $10^{28}cm$  plus 1 cm, then the distance between those states in the one-dimensional space  $R_1$  will be an insignificant 1 cm.

Further, the notion of time is introduced. In accordance with our conception, by the discrete time of byuon is meant a sequence of events corresponding to discrete changes in index  $i$  of 1 up or down, which means a transition from one state to another. In connection with discrete time, a time quantum  $\tau_0$  and space quantum  $\tilde{x}_0$  are introduced in the one-dimensional discrete space  $R_1$  formed by states of byuon ( $\tau \approx 0.9 \cdot 10^{-43}s$ ,  $\tilde{x}_0 \approx 2.8 \cdot 10^{-33}cm$ ). As  $R_1$  is discrete, one way to parametrize (represent)  $x(i)$  is  $x(i) \approx \tilde{x}_0 \cdot i$  or  $x(i) \approx -\tilde{x}_0 \cdot i$ . As is seen, the magnitude of  $x(i)$  can be both positive and negative. Similar parameterization for time  $t = (\tau j)$  gives only positive magnitudes of  $t$  (here  $t$  is an always increasing index taking only integer positive values and the number 0). Note that in the existing physics of elementary particles [21], a notion of negative time is used to introduce antiparticles. This is not necessary in the present model.

Thus the byuon is characterized by indexes  $i$  and  $j$  ( $i \leq j$ ). We will consider only the case of  $i = j$ .

**Statics.** In the set  $\{\Phi(i)\}$ , no static states with time  $t > \tau_0$  are meant. That is, the byuon is always in state of continuous changing.

**Kinematics.** A free byuon state (that is, not interacting with another state) can correspond only to one of four so called vacuum states  $\Pi^+$ ,  $\Gamma^+$ ,  $\Gamma^-$ ,  $\Pi^-$  depending on whether the vector  $\Phi(i)$  is real or imaginary, its length  $X(i)$  positive or negative, decreases or increases in modulus.

Introduce the following definitions:

1. The free byuon is in vacuum state  $\Pi^+$  if its positive length discretely increases of a quantum of distance  $\tilde{x}_0$  in a quantum of time  $\tau_0$ . At that the speed of byuon propagation (increasing in length)

$$c = \frac{\tilde{x}_0 - 0}{\tau_0} = c_0 \quad (c_0 \text{ is speed of light}).$$

2. The free byuon is in VS  $\Gamma^+$  if its length discretely decreases of a quantum of distance  $\tilde{x}_0$  in a quantum of time  $\tau_0$ . In this case  $c = \frac{0 - \tilde{x}_0}{\tau_0} = -c_0$ .

3. The free byuon is in VS  $\Pi^-$  if the modulus of its negative length discretely increases of  $\tilde{x}_0$  in a time  $\tau_0$ . Therewith  $c = \frac{-\tilde{x}_0 - 0}{\tau_0} = -c_0$ .

4. The free byuon is in VS  $\Gamma^-$  if the modulus of its negative length discretely decreases of  $\tilde{x}_0$  in a time  $\tau_0$ . In this case  $c = \frac{0 - (-\tilde{x}_0)}{\tau_0} = c_0$ .

Note that the known fundamental constant, light speed, appears in the byuon theory as a result of byuon changes. In what follows the reader will know that, when having specified only three constants: modulus of  $A_g$ ,  $\tau_0$  and  $\tilde{x}_0$ , we obtain values of all other fundamental constants and basic properties of the entire world as well.

It is seen from the definition of byuon's VS that the byuon is continuous dynamics, i.e., that is constantly appearing and disappearing, increasing and decreasing. The set of free (not interacting)

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byuon vacuum states  $\Pi^+$ ,  $I^+$ ,  $I^-$ ,  $\Pi^-$  forms physical vacuum of one-dimensional space  $R_1$  in terms of index  $i$ , that is, such a set of VSs where the concept of energy is not introduced at all since there is yet no notion of interaction between VSs of the byuon. Note once again that for each byuon, its own order of time reference is introduced. For future objects originated at any stage of “life” of byuon by the way of renumbering indexes (for example,  $i = 1000$  is denoted by index  $\sigma = 1$ ), we should say about reference of a new time, and hence about the origin of a new byuon with its own reference of indexes. We will call such a renumbering a new branch of the byuon. One of two directions in the one-dimensional space  $R_1$  coincident with the inner byuon direction of maximum positive value of  $x(i)$  in VS  $\Pi^+$ , is taken as the positive direction of vector  $\Phi(i)$ .

Assume that for the byuon VS with length more than  $\tilde{x}_0$ , only contact interaction is realized, by which is meant the existence of no lesser than two VSs of the byuon in any quantum of space  $R_1$  in a quantum of time.

Location of byuon in one or another VS is of probabilistic character and described by four  $\psi$ -functions with indexes corresponding both to VSs and magnitudes of quantum number  $i$ .

Advance a hypothesis 1. *Let the observable three-dimensional space  $R_3$  be formed as a result of minimization of potential energy of byuon VSs interaction in the one-dimensional space  $R_1$  formed by them. More precisely, the space  $R_3$  is fixed by us in consequence of dynamics of objects generated by interaction of VSs of the byuon. That is, dynamic processes arise in the space  $R_3$  for objects with residual (after minimization) positive potential energy of interaction of byuon VSs, and, as a result, wave properties of appearing elementary particles come into existence.*

In this work we view only setting up a problem and give results of estimations that confirm the hypothesis advanced in the context of the our model and discuss the new method in order to obtain an electric energy.

**Table .Basic results of byuon theory []**

Given	Obtained
1. The quantum of space $\tilde{x}_0 \approx 2.8 \cdot 10^{-33}$ cm. 2. The quantum of time $\tau \approx 0.9 \cdot 10^{-43}$ s. 3. The module of cosmological vector-potential $A_g$ . $A_g \approx 1.95 \cdot 10^{11}$ Gs·cm	a. The fundamental scales: $x_0 = k \tilde{x}_0 \approx 10^{-17}$ cm; $ct^* = kN \tilde{x}_0 \approx 10^{-13}$ cm; $L = kNP \tilde{x}_0 \approx 10^{28}$ cm; $k, N, P$ - calculated periods of interaction of byuons.
	b. The fundamental constants: speed of light $c_0 = \tilde{x}_0 / \tau$ , the elementary electric charge $e_0^2 = (1/(4\sqrt{3})) A_g^2 x_0^2 (x_0/ct^*)^{3/2}$ Planck's constant $h = (([A_g x_0]_{II} + [A_g x_0]_I) / c_0) x_0 / ct^*$ .
	c. The constants of all interactions, for example, vector constant of weak interaction $C_v = e_0 A_g 2x_0^3$ .
	d. Mass spectra of leptons (electron, muon, tau-lepton and next lepton), main barions, and mesons, for example, the mass of electron: $m_e c^2 = m_{46} c^2 (ct^*/x_0)$ ; the minimum value of that residual potential energy: $E_{k_{min}}^0 = (A_g^2 \tilde{x}_0^2) / (2\tilde{x}_0) = m_{46} c^2 = 33 \text{ eV}.$
	e. The density of matter in the Universe $\sim 10^{-29}$ g/cm <sup>3</sup> (physics of dark matter; dark energy: physics on the base of new force, equation of electromagnetic field, values galactic and intergalactic magnetic fields and asf.

### 3. THE NEW NON-GAUGE INTERACTION IN NATURE

There are only four interactions (forces) in modern physics: strong, weak, electromagnetic and gravitational. All modern physical models are gauge theories. It was shown in [1 - 3] that elementary particle mass ( $\Delta mc^2 \approx 33$  eV) is in party proportional to the modulus of summary potential ( $A_\Sigma \leq A_g$ ). Variation in the modulus of due to other field potentials ( $\Delta A_\Sigma$ ) should lead to the emergence of new natural force that is nonlinear and nonlocal and can be represented by a series in terms of  $\Delta A_\Sigma$ . In this case, the first term of the series in terms of  $\Delta A_\Sigma$  has the form  $\sim \Delta A_\Sigma \cdot \partial \Delta A_\Sigma / \partial x$ , where  $x$  is a spatial coordinate in three-dimensional space  $R_3$ . Many of the experiments discussed below were constructed

by analyzing this term of the series. To verify the existence of a new force, numerous fundamental experimental investigations were conducted at the best experimental facilities of the Soviet Union and Russia. The first investigations were performed using the experimental equipment at the Kurchatov Institute and the General Institute of Physics, Russian Academy of Sciences, using a torsion balance inside high current magnets. A force of 0.07–0.08 g was established for a body with a mass of about 30 g. These studies were submitted for publication in *Proceedings of the USSR Academy of Sciences* by Nobel Laureate and Academician A.M. Prokhorov [22, 23]. This force was further investigated at the experimental facilities of the Sternberg Astronomical Institute (Moscow State University) [1 - 3] using Sodin gravimeters produced in Canada; at the experimental facilities of the Joint Institute for Nuclear Research (Dubna) and the Institute of Nuclear Research (Russian Academy of Sciences, Troitsk) (investigations on the variations in the decay rate of radioactive elements) [1 - 3, 24 - 28]; at the experimental facilities of Moscow State University and the Central Research Institute of Machine Building (TsNIIMash) using plasma devices [1 - 3, 29, 30]; and at the experimental facilities of other institutes in Russia. The existence of a new natural force has been established quite firmly and confirmed by a multitude of astrophysical observations (the motions of pulsars [31, 32] and the motion of the Sun [1, 2], a natural astronomical object that is taking us toward the constellation of Hercules under the action of this force). Among other things, it was used to reveal the nature of the dark energy repulsing galactic clusters [33].

The discovery of a new natural force was officially proclaimed at a conference in Italy (Santa Flavia, Sicily, in September 2013) by Italian physicists studying solar energy and new energy sources [34].

In this study, we consider results from fundamental experiments that allow us to judge the direction of vector  $\mathbf{A}_g$  with quite high accuracy, present a theoretical substantiation of existence of vector, and show the results from practical use of this new natural force in order to obtain an electric energy. The authors of [3, 29] presented the results from experimental investigations of the plasma integral according to time and the spectrum of luminosity of plasma formed by a pulsed plasmatron, depending on the position of its axis relative to the surrounding space and thus the direction of the discharge current vector relative to vector  $\mathbf{A}_g$ . It was shown in these experiments that the spatial intensity distribution of plasma radiation was clearly anisotropic, and the plasma radiation was strongest along the generatrices of a certain cone of directions of the plasmatron axis with an opening on the order of  $90^\circ$ – $120^\circ$ . It was shown that vector directed along the axis of the above cone had the following coordinates in the second equatorial system of coordinates: right ascension  $\alpha = 293^\circ \pm 10^\circ$  and declination  $\delta = 36^\circ \pm 10^\circ$ . The results from these experiments agreed with ones obtained earlier in determining the direction of vector [2] and were most precise at the level of yr 2012. It was shown in [3] that three anisotropic directions were established in studying the  $\beta$  - decay of radioactive elements [25]: two along the generatrices of the above cone and one along its axis, i.e., along vector its axis, i.e., along vector  $\mathbf{A}_g$ .

The authors of [35] presented the results from measuring period  $T_{1/2}$  of  $\beta$  - decay for  $^{32}\text{Si}$  from 1982 to 1986 at the Brookhaven National Laboratory (BNL) (United States) and similar results for the  $\alpha$  - decay of  $^{226}\text{Ra}$  ( $T_{1/2} \approx 1602$  yr) obtained in Germany (Physikalisch-Technische Bundesanstalt (PTB)) from 1984 to 1999. Annual oscillations at a level of 0.1–0.25% were observed in both decays. An analysis of the results of these two experiments [35] showed that the correlation between them was  $\sim 85\%$ . The authors of [35] introduced the hypothesis that the distance to the Sun influenced the variations in  $T_{1/2}$  of the above decays. Our planet is at its minimum distance from the Sun around January 4 ( $\alpha = 283^\circ$ ). It should be noted that the authors of [31] showed that the direction of the minimum–maximum line of season deviations [35] corresponded approximately to  $\alpha \approx 293^\circ$  with a spread of around  $\pm 30^\circ$ . They also explained that oscillations observed in decays [35] corresponded to the effect of an assumed anisotropic natural force resulting from the influence of the gravitational potential and vector potential of the Sun's magnetic field. It was noted that the maximum spikes ( $\approx 0.3\%$ ) observed in 1988 and 1999 were probably associated with a change in the polarity of a dipole component of the solar magnetic field. Such changes are observed each 11 years on average and occurred in the above annual interval.

Let us consider the long term experiment [26] with scintillation detectors performed at the Joint Institute for Nuclear Research from December 9, 1998, to April 30, 1999, to investigate variations in the  $\beta$ -decay rate of  $^{137}\text{Cs}$  and  $^{60}\text{Co}$ . The main disadvantage of such experiments is that in analyzing the results, it is impossible to separate contributions introduced by the internal life of the installation and

the phenomenon under study. The installation described in [26] made it possible to perform precision measurements by controlling the parameters of the system at different discrimination thresholds for the decay energy of  $^{137}\text{Cs}$  and for  $^{60}\text{Co}$ .

Thirteen information channels were analyzed: the high and low voltage level, internal installation temperature, and so on. Analysis of the extreme spikes showed that the directions of the new non-gauge force at the points of the extreme spikes coincided qualitatively (error of  $\pm 10^\circ$ ) with the directions of force found in earlier experiments [2]. It should also be noted that background measurements (the flux of particles in this channel was no larger than 50 particles/s) showed the flux was so low relative to oscillations of the flux of particles emitted at  $2\sigma$  (~600 particles/s, and it was these particles that were analyzed) that its oscillations were unable to affect the distribution of the spatial coordinates of extreme points. What is important for the period from December 9, 1998, to April 30, 1999, is that the effect of the observed anisotropy (with a period close to daily) weakened and disappeared almost completely starting in the middle of January 1999 ( $\alpha = 293^\circ \pm 15^\circ$ ). The authors of [27] presented the results from their long experimental search for variations in the  $\beta$ -decay rate of  $^{60}\text{Co}$  from December 28, 2010, to February 8, 2012, performed at the facilities of the Joint Institute for Nuclear Research using  $\text{LaBr}_3$  based scintillation detectors and procedures for matching observations of the  $\gamma$ -quanta with energies of 1.173 and 1.332 MeV that accompany the  $\beta$ -decay of  $^{60}\text{Co}$ . Standard processing methods and the Kolmogorov–Smirnov (K–S) statistical method, which shows deviations from the daily decay uniformity (the maximum probability of deviation corresponds to the minimum of a result's significance), were used to process the experimental results.

Evidence of deviations from the daily pattern in the  $\beta$ -decay rate of  $^{60}\text{Co}$  in 2011 was established in the following ten-day periods: from March 11 to March 21 with significance level  $a = 0.1$ ; from April 22 to May 2 with  $a = 0.0125$ ; from June 24 to July 4 with  $a = 0.05$ ; and from August 4 to August 14 with  $a = 0.05$ . It was noted in [10] that the directions of the action of a new non-gauge force arising from the influence of the vector potential of the magnetic field of the Earth for the decade from April 22 to May 5 lay in the vicinity of the generatrices of the abovementioned cone or in the vicinity of direction  $\mathbf{A}_g$  with an error of  $\pm 10^\circ$ . In contrast to the experiment in [26], all significant results were recorded in the Spring–Summer period, since (as was noted above) the effect almost vanished in the spring (which is explained by the change in the polarity of the magnetic dipole of the Sun in the period 1999–2000) [36]. The effect the temperature had on the instrument readings was investigated in the experiment, since the temperature greatly affects readings for all measurements made using scintillation detectors. The setup was contained in a thermostat that kept the temperature at a level of  $30.6 \pm 0.1^\circ\text{C}$ .

The authors of [28] analyzed the data for the ten days from July 23 to August 2 in 2011, when a temperature spike was observed in Moscow due to anomalous heat and the thermostat was taken out of the operational mode. The results from this analysis showed that the observed harmonic with a period close to one day, which is apparent in the figures presented in [28], had virtually no response to an increase in the power of the in phase harmonic in the fundamental spectrum of  $\gamma$ -quanta accompanying the  $\beta$ -decay of  $^{60}\text{Co}$ . The value of the K–S criterion in this case did not reach the boundary level of significance, 0.3. The experiment thus showed that temperature was not responsible for the observed deviation in the  $\beta$ -decay rate of  $^{60}\text{Co}$  from the one that was uniform with respect to the time of day. The above experiments investigated the anisotropic properties of a new non-gauge force in the vicinity of the Earth and the Sun. To determine the propagation of the anisotropic properties of the new force on the scale of our Galaxy, the authors of [31, 32] investigated the directions of the motions of pulsars, the strongest magnets in our Galaxy (modulus of a pulsar's magnetic field can be as high as  $\cong 10^{12}$  G), which emerge from the final collapse of supernovae. Since the diameters of these objects are  $\approx 10$  km, their vector potential modulus can approach the modulus of vector  $\mathbf{A}_g$  and the action of the new force on a pulsar's motion should therefore be clearly pronounced. The authors of [31] presented diagrams of the orientation of the rates of motion for 147 pulsars. The diagrams clearly showed the anisotropy of pulsar motion, which qualitatively coincides with the inverse cone of the action of the new force. The latter is clear since this force emits matter in one direction due to the action of the vector potential of a pulsar's magnetic field so that the pulsar moves in the opposite direction due to reactive motion.

The author of [37] developed a mechanism for accelerating cosmic rays (CRs) with the help of the new non-gauge natural force. They showed that using this force, a CR can reach energy  $E$  exceeding

the Greisen–Zatsepin–Kuzmin limit of  $5 \times 10^{19}$  eV. It was shown in [19] that such particles with  $E \geq 10^{20}$  eV have been observed in CRs in recent years. The data on the negligible CR anisotropy established by some of the world's leading laboratories (Milagro, Tibet, upper Kamiokande) in the region of Cygnus were also presented. This anisotropy corresponds to the orientation of the action cone generatrices of the new force, while the regional coordinates ( $\alpha = 305^\circ \pm 5^\circ$  and  $\delta = 40^\circ \pm 5^\circ$ ) virtually coincide with the direction of vector  $\mathbf{A}_g$ .

A new principle for the motion of space vehicles (SVs) that was based on using physical space as a support medium was described for the first time in [1, 2, 34]. It was shown in [34] that any object reduces the magnitude of the modulus of  $A_\Sigma$  wherever it is located in physical space due to interaction between the potentials of the physical fields of elementary particles. This comprehensive reduction in  $A_\Sigma$  is called the information image (II) of the object and is characteristic of it only since it is codified by coefficients  $\lambda_i$  ( $i = 1, 2, 3, \dots$ ), in a complicated series of terms for varying  $A_\Sigma$  through the field potentials of the object. If the object returns to its

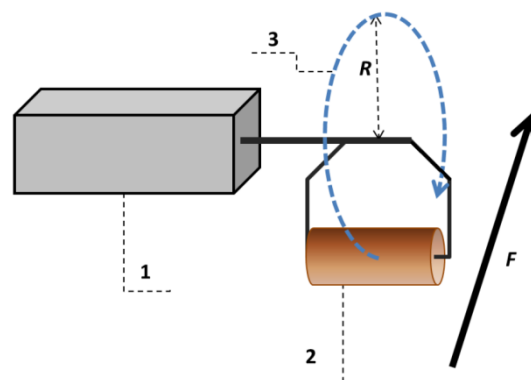
own II as it moves, this place in physical space will repel it due to the action of a new non-gauge force associated with the reduction in  $A_\Sigma$ . It is this repulsion that can be used to propel SVs.

A long term experiment to investigate a new force for vehicle propulsion that in the future could be used for SVs was performed in Italy from January 26, 2013, to February 28, 2014 [38]. A model source of propulsion was installed on a spherical vehicle about 1 m in diameter in order to equalize the force of friction with water in different directions. A load with mass of 526 g rotated in a perpendicular plane. From January 26 to June 26, 2013; the rotation period of the load was 0.22 s. To form the II, the load was stopped in the lower part of its trajectory for 0.12 s. From June 28, 2013, to the end of measurements, the rotation period coincided with the stopping time and was equal to 0.3 s. As the load approached its II, pulsed propulsion that varied according to the day and season emerged under constant external conditions. The experimental results for the average force of propulsion per rotation are shown in [38]. It was noted in [38] that the magnitude of the force grew considerably along with the period of rotation.

The authors attributed the greater force in the beginning of the experiment to the end of variations in the direction of the dipole component of the Sun's magnetic field. It can be seen from the figure [38] that an abrupt drop in the reaction was observed beginning on February 6, 2013, and continued to August 6, 2013 (excluding certain spikes). This phenomenon was explained in [38] as being due to the existence of the II varying in physical space depending on the vehicle's motion along vector in the first six months and against it in the second six months, making it possible to determine the global anisotropy coordinate ( $\alpha \approx 316^\circ \pm 5^\circ$ ) with greater accuracy. We emphasize that this source of propulsion uses no fuel, but its specific power consumption is  $\sim 3 \text{ W g}^{-1}$ , exceeding the possibilities of the best electric motors for SVs by a factor of  $\sim 40$  [38]. Maximum value of force observed in these experiments was about 50g (minimum of period of rotation is equal 0.2 s [34]).

#### 4. THE NEW METHOD IN ORDER TO OBTAIN AN ELECTRIC ENERGY

New non-gauge force for space vehicle propulsion also can be use as basic element of a new electric generator.



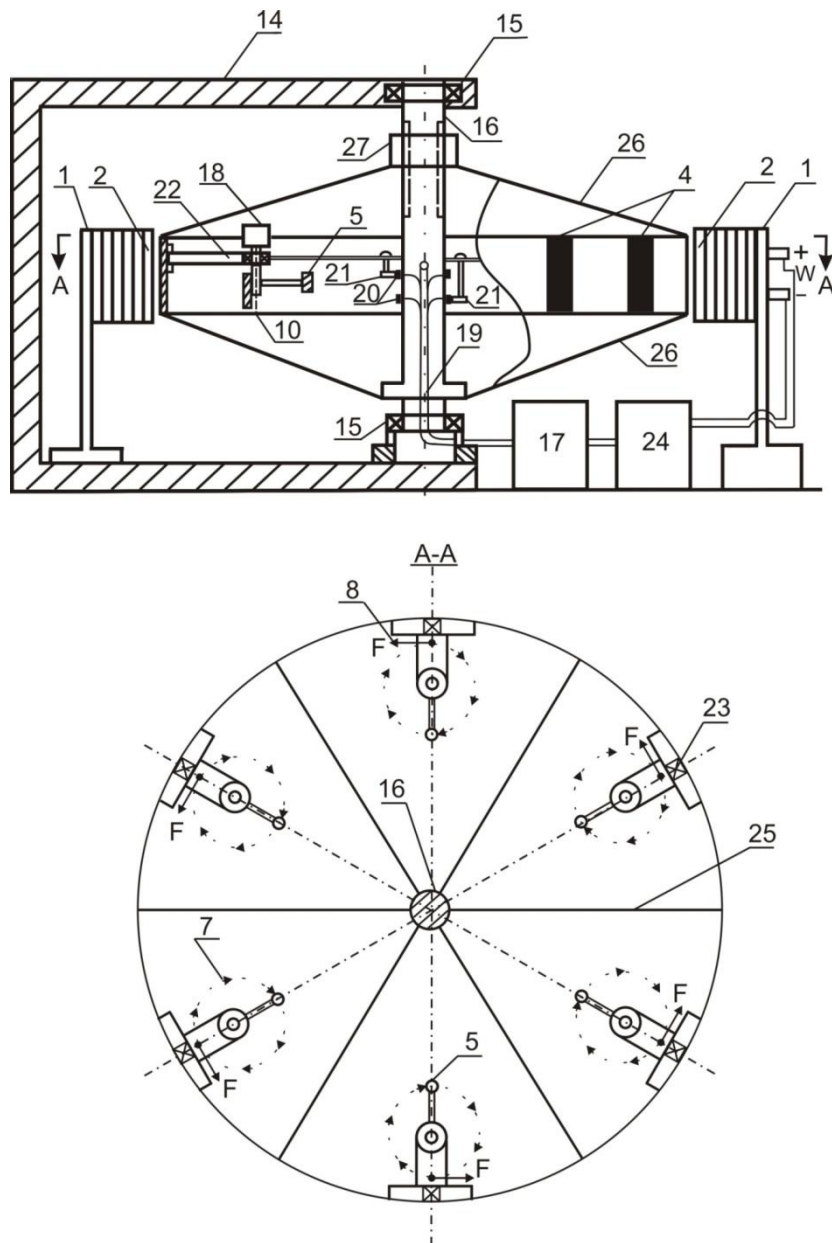
**Fig1.** Schematic view of the new thruster – basic element of electric generator 1 – electromotor (i.e. a step motor or servo motor); 2 – off-center iron load; 3– rotational trajectory of the load, periodically resting along or near the vertical; R - revolution radius, not less than 5 cm; F – expected vector of action of the new force, producing cyclic impulses just before each stop of the load, opposite to the direction of motion of the load itself.



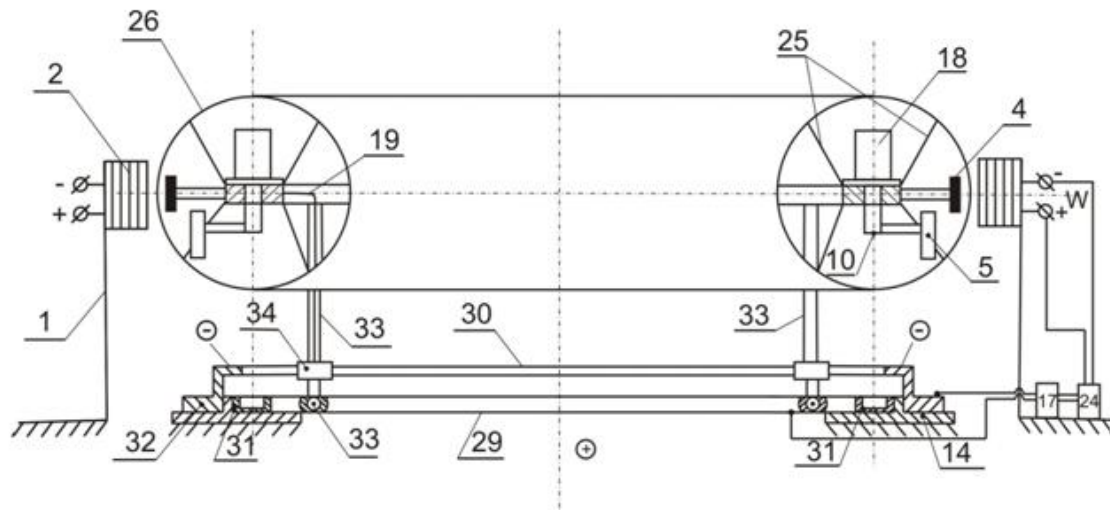
## The Byuon Theory, New Non-Gauge Interaction and the New Method in Order to Obtain an Electric Energy

Fig. 1 shows the basic element of a new electric generator [39], including a programmable electro-motor, a simple mechanical device nested into the motor's shaft and in turn carrying an off-center cylinder-shape iron load performing revolutions on a vertical plane orthogonal to the motor's shaft at a distance not less than 5 cm from it. The motor allowed to regulate the load's revolution period, its cyclic stop in the same position, as well as the load's rest time in the stop position. Fig. 2, 3 shows the constructions of electric generators using the basic element for realization of byuon energy and the new non-gauge force for obtaining of the electricity.

The constructions of electric generators have following elements: 1 - a stator with which we take the electric power (W); 2 – induction coil; 4 – constant magnets; 5 - special loads; 7 – trajectory of special loads motion; 8 – direction of new force in moment of special loads top; 10 – constructions of big rotor with the new thrusters and constant magnets; 14 – bed; 15 – bearings; 16 – axis of big rotor with the new thrusters; 17 – current source for the new thruster; 18 – servo –motors; 19 – wires; 20 – current removable hoops; 21 – current brushes; 22 – elements of construction of big rotor for new thruster support; 23 – element of control system of big rotor rotation; 24 – measuring of nominal power; 25 – spokes; 26 – casing; 27 – nut for casing tension; 29 – rails for positive contact; 30 - rails for negative contact; 31 – section of rails for positive contact; 32 - section of rails for negative contact; 33 – post; 34 – sliding contact.



**Fig2.** The construction of electric generators for power is equal about 10 – 100 kWt.



**Fig3.** The construction of electric generators for power is equal about 100 kWt and more.

The operating principle of the new electric generator is very simple. The new thruster speed up the big rotor of electric generator with magnet and we obtain the electricity using Farad's law.

We can obtain a magnitude of new non-gauge force up to 500g by increasing the mass of space thruster special loads and decreasing the period of special load rotation. For this value of new force "Byuon Space Energy corporation" LLC has all technical characteristics, the documentation and the working drawings of new electric generator with a dynamo (the power  $\approx 11$  kWt) connected with the axis of big rotor. The diameter of big rotor is equal 8m. The creation time is about 1 – 1.5 year. It cost is a less 1 million \$ USA. We have not the technical problems but we have not the money for realization this project.

#### REFERENCES

- [1] Yu.A. Baurov, Structure of Physical Space and New Method of Obtaining Energy (Theory, Experiment, Applications), Moscow, "Krechet", 1998 (in Russian).
- [2] Yu.A. Baurov, On the structure of physical vacuum and a new interaction in Nature (Theory, Experiment and Applications), Nova Science, NY, 2000.
- [3] Yu.A. Baurov, Global Anisotropy of Physical Space. Experimental and Theoretical Basis. Nova Science, NY, 2004.
- [4] Aristoteles, v.3, Moscow, "Mysl", 1981 (in Russian).
- [5] A.N. Vyaltsev, The discrete space-time, Moscow, "Nauka", 1965 (in Russian).
- [6] D.I. Blokhintsev, Space and time in the microworld, Moscow, "Nauka", 1982 (in Russian).
- [7] Time structures in natural sciences: on the road to right understanding of time phenomenon. Part 1. Interdisciplinary research. Ed. By Moscow State University, 1996 (in Russian)
- [8] N.A.Kozyrev, Causal or asymetric mechanics in nonlinear approximation. Astronomical State Observatory of Russian Academy of Sciences, Pulkovo, 1958, p.90 (in Russian); N.A.Kozyrev, Selected works, Leningrad, 1991 (in Russian).
- [9] R.A.Alpher, M.Bethe, G.Gamov, Phys. Rev., 1946, v.70, p.572; i bid: 1948, v.73, p.803.
- [10] A.D.Linde, Uspekhi Fizicheskikh Nauk (UFN), 1984, v.144, p.177.
- [11] G.Yu. Bogoslovsky. Theory of locally anisotropic space-time. Ed. by Moscow State University, 1992 (in Russian).
- [12] Rund Kh. Differential geometry of Finsler's spaces. Moscow, "Nauka", 1981.
- [13] N.N.Bogolyubov and D.V.Shirkov, Introduction to the theory of quantized fields, Moscow, "Nauka", 1976 (in Russian).
- [14] L.B.Okun', Leptons and quarks, Moscow, "Nauka", 1990 (in Russian).
- [15] J.H.Shwartz, Superstrings, Singapore, "World Scientific", 1985.
- [16] Yu.A. Baurov, L. Albanese, F. Meneguzzo, American Journal of Astronomy and Astrophysics. Vol. 2, No. 2, 2014, pp. 47-53. doi: 10.11648/j.ajaa.s.20140202.17

- [17] Yu.A.Baurov, Yu.N.Babaev, and V.K. Ablekov, Doklady Akademii Nauk (DAN) SSSR, 1981, v.259.
- [18] Yu.N.Babaev, Yu.A.Baurov, Preprint P-0362 of Institute for Nuclear Research of Russian Academy of Sciences (INR RAS), Moscow, 1984 (in Russian).
- [19] L.V. Leskov. Bulletin of Moscow University. Part 7, Philosophy, N 2, 1994. (in Russian).
- [20] P.A.Dirac. Ways of Physics, Moscow, “Energoatomizdat”, 1983 (in Russian).
- [21] N.F.Nelippa, Physics of elementary particles, Moscow, “Vysshaya Shkola”, 1977 (in Russian).
- [22] Yu.A.Baurov, E.Yu.Klimenko, and S.I.Novikov, DAN SSSR, 1990, v.315, p.1116.
- [23] Yu.A.Baurov, P.M.Ryabov, DAN, 1992, v.326, p.73.
- [24] Yu.A. Baurov, V.L Shutov, *Prikl. Fiz.*, 1995, no. 1, p. 40.
- [25] Yu.A. Baurov et. al., *Mod. Phys. Lett. A*, 2001, vol. 16, p. 2089.
- [26] Yu.A. Baurov, Yu.G. Sobolev, Yu.G., Yu.V. Ryabov and W.F. Kushniruk, *Phys. Atom. Nucl.*, 2007, vol. 70, p. 1825.
- [27] Yu.A. Baurov et. al., 2013, arXiv: 1304.6885.
- [28] Yu.A. Baurov, *Am. J. Mod. Phys.*, 2013, vol. 2, p. 177.
- [29] Yu.A. Baurov et. al., *Phys. Lett. A*, 2003, vol. 311, p. 512.
- [30] Yu.A. Baurov, A.G. Znak and V.G. Farafonov, *Advances in Plasma Physics Research*, 5, 179, N.Y. Nova Science, (2007).
- [31] Yu.A. Baurov, I.F. Malov, *Int. J. Pure Appl. Phys.*, 2010, vol. 6, p. 469.
- [32] I.F. Malov, Yu.A. Baurov, *Astron. Zh.*, 2007, vol.84, no. 10, p. 920.
- [33] Yu.A. Baurov, I.F. Malov, *Int. J. Mod. Phys. A*, 2010, vol. 1, p. 17.
- [34] Yu.A. Baurov, L. Albanese, F. Meneguzzo, et al., *Am. J. Mod. Phys.*, 2013, vol. 2, p. 383.
- [35] J.H. Jenkins, et. al., 2008, *Astropart. Phys.*, 2009, vol. 32, pp. 42–46.
- [36] I.S. Veselovsky et. al., *Rom. Astron. J. Suppl.*, 1999, vol. 9, p. 29.
- [37] Yu.A. Baurov, *J. Mod. Phys.*, 2012, vol. 3, p. 1744.
- [38] Yu.A. Baurov, L. Albanese, F. Meneguzzo, et.al., *American Journal of Astronomy and Astrophysics*, 2014; 2(2): 40-46.
- [39] Yu.A. Baurov, F. Meneguzzo, A. Yu. Baurov, A.Yu. Baurov (Ju.) Patent of Italy, Florence, The Method in order to receive of an electric energy, № FI2012A000185 from 2012, September 19.