

Electromagnetic Shells of Atoms and the Periodic System of Elements

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Abstract

Experimental and theoretical researches performed by the author (period: 1969-present) showed that the magnetic spinor particles (magnetic charges) are real structural components of atoms and substance and are immediate sources of all magnetic fields and magnetic manifestations in Nature. Magnetic charges, which constitute together with electrical charges the atomic shells, got of the Author's title: magnetons and antimagnetons (respectively, with magnetic charges g^- and g^+ , under fundamental condition: $g = e$). Besides, together with electrons and magnetic charges in the structures of atomic shells, in the same quantities as the electrons, exist real electric antispinors, *i.e.* the true antielectrons. In the structures of the atomic shells on each electron fitted still three a real spinor particles: two magnetic (magneton and antimagneton) and one electric, *i.e.* true antielectron with a charge of e^+ . The spinor particles in atomic shells exist in the form of the two spinor associations: the electromagnetic dibispinors or S-Gravitons and magnetic bispinors (spinorial magnetic dipoles). Magnetic bispinors, which inhabited on the 3d and 4f-shells are the sources of the atomic magnetic fields and are responsible at all magnetic manifestations of the so-called magnetic atoms (iron, nickel, cobalt and others). In composition of S-Graviton is two related bispinor (electric and magnetic). S-Gravitons make up bulk of the charged density of atomic shells and are direct sources of the atomic gravitational field. If to replace all electrons on known of the atomic levels and sub-levels on S-Gravitons, can get an idea about the real electromagnetic device atomic shells most of the elements making up the Periodic Table. In article shows features the structural organization real (electromagnetic) shells of atoms that make up the periodic system of elements, as well as is considered the possibility of adaptation of the well-known quantum numbers, the Pauli's principle and Hund's rule, in relation to the atomic electromagnetic device. The main reasons for the fact that the real magnetic charges, as well as the true antielectrons, were "buried alive" in the modern theories are as physics confinement them in atoms and substance, which is cardinally different from

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the confinement, for example, electrons, so and vicious electromagnetic concept of Maxwell. In the framework of this concept really existing in atoms and substance the magnetic charges, have been mistakenly substituted on acts of the mechanical displacement of electrical charges.

Keywords

Magnetic Spinor Particles (Spinors and Antispinors), Magneton and Antimagneton, Bispinor, Dibispinor, S-Graviton, Physical Mass, Vortex Electromagnetic (Gravitational) Field, Paragravitation and Ferrogravitation, Gravito-Levitation, Quantum Numbers

1. Magnetic and Electric Charges in the Atomic Shells. Real Magnetism of Atoms and Substance

Magnetic charges (magnetic spinor particles) as immediate sources of all magnetic fields and magnetic manifestations in the Nature were discovered by the author in structures of atoms and substance and were presented to the scientific society in 2001 in publication [1]. Experiments that prompted the author to study the problem of participation of the real magnetic charges in structure atoms and substance were his experiments with the magnetic neutron scattering in ferrimagnetic crystals [2] [3] (1970-1971). Detected in these experiments, a significant displacement of all density so-called magnetic moments Fe^{3+} ions from the nuclei served as a basis for the author's assumption of possibility structural participation of the magnetic charges in atoms and substance. The results of subsequent experiments conducted by the author [4] [5] [6] showed that in the structures of the Physical mass (atoms, nucleons, substance, etc.), the magnetic particles (spinors and antispinors) are present in approximately the same amount as the electric particles. Brief summaries of the results of basic experiments of the author in the English language are given in the publication [6].

Note 1. For greater lucidity, we note that the concept “the spinor particle” used in the article should be attributed solely to the fundamental charged particle with electric or magnetic charge, and the term “the spinor particle” is synonymous of term “the charged particle”.

The magnetic spinors within atomic shells (the author calls them magnetons) are the fundamental particles of Matter, which by their physical parameters are the magnetic analogs of electrons, *i.e.* they have values of the charge and spin equal to the corresponding parameters of electrons. Magnetons like electrons exhibit charged with negative sign (g^-), they relate to the class of leptons and by their statistic properties to fermions (the spin equal to 1/2).

Magnetic antispinors, for example antimagnetons, are true antiparticles in relation to magnetons. They have a positive magnetic charge (g^+) and relate to antileptons. By their statistic properties the antimagnetons are antifermions with an antispin ($-1/2$) in relation to the magnetic spinors.

The main physical parameters of the magnetic and electric spinor particles (magneton, antimagneton and antielectrons) constituting together with electrons of the atomic shells, given in **Appendix** of this article.

Magnetic bispinor (the magnetic spinorial pair: magneton and the corresponding antimagneton) which revolving on atomic orbit and also in the lattice conductor, will be create in the plane rotation of the well-known of the vortex magnetic field, that is determined by the vortex vector $\text{rot}\mathbf{H}$. Direct process of formation the latter field is described by equation: $k \text{rot}\mathbf{J}_g = \text{rot}\mathbf{H}$, where $\text{rot}\mathbf{J}_g$ is vector of the vortex current of magnetic charges, and in model representation is of the rotating magnetic bispinor, k -the proportionality factor. The above-described process of direct formation of the vortex magnetic field is shown in **Figure 1(a)**.

It is important to note that the swirling motion of the magnetic bispinors in the conductor is ensured by constant electric current. This process is written in the following form: $k \mathbf{J}_e = \text{rot}\mathbf{J}_g$, where \mathbf{J}_e is the vector of the density linear electric current. The role of the direct electric current under the formation of the vortex magnetic field around the conductor, consists solely in “organizing” the vortex motion of magnetic bispinors. **In the absence of magnetic charges near lines of the electric current, the magnetic field can not be formed.**

Thus, compulsory sequence of the actual physical processes in a conductor with a constant electric current, which leads to the formation of vortex magnetic field, can be written as: $\mathbf{J}_e \rightarrow \text{rot}\mathbf{J}_g \rightarrow \text{rot}\mathbf{H}$. We will notice that in Maxwell’s electromagnetic (EM) concept, in which the real magnetic charges were ignored (unintentionally), the se-

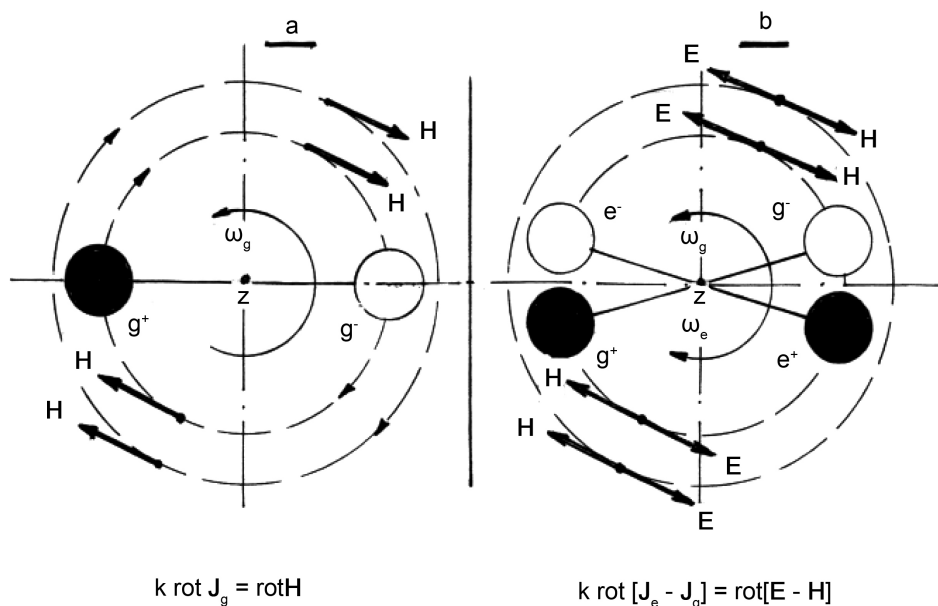


Figure 1. Schemes of mechanisms formation of the vortex spinor fields: magnetic (a) and electromagnetic (gravitational) (b). By white circles on the figure showed negative charged electric and magnetic spinors: electron (e^-) and magneton (g^-) and black circles-positively charged anti-spinors corresponding to them with charges e^+ and g^+ .

quence of processes at formation of magnetic field round the conductor with direct electric current is represented as follows: $\mathbf{J}_e \rightarrow \text{rot}\mathbf{H}$ [7].

Next, it is important to note, that the first person who discovered experimentally the magnetic charges in the substance was F. Ehrenhaft [8], who published about forty articles from 1910 to 1945, dedicated to the discovery and study of real magnetic charges. The Ehrenhaft experiments this magnetic analogues of known tests Milliken which was aimed at determining the magnitude of the charge of the electron. Very small particles of various solid substances were placed into vertical uniform magnetic field, free from residual electric charges. The particles were illuminated by concentrated light beam. The optical system was made it possible to determine parameters of their movement. The basic experimental result of Ehrenhaft and his numerous followers consisted in the fact that it was found a logical movement of the particles along power lines of the magnetic field. With changing the field direction the direction of particles movement also changed. According to the findings Ehrenhaft, motions of particles that observed in his experiments, determined by charged state of the particles and charged namely by magnetic charges different signs.

However, interpretation of the experimental results which was built by Ehrenhaft on analogy with behavior of electric particles in the electrostatic field, does not appear convincing enough. Besides, values of forces in the observed interactions were comparable, for example, with parasitic, so called, radiometric forces. It is also obvious, and then that such serious conclusions which were made by Ehrenhaft, has need in deepening and first of all in the sense of development of conceptions about physical parameters of magnetic charges (magnetic spinor particles) and their place within the substance structures. In any event, the experiments of Ehrenhaft and his followers, which brought interesting and important results, did not obtain recognition and were forgotten.

In 1931 the question about possibility of existence of magnetic poles, so called magnetic monopoles, was considered by P. Dirac [9] within the framework of quantum electrodynamic. According to conclusions of the Dirac, the quantum theory, like and classical theory, well allowed existence of magnetic monopoles. However, the minimum possible magnetic charge (g) of such particles turned out to be extremely great, according to the theory- $68, 5e$, where e is charge of an electron.

In its publications [5] [6] [10], the author notes that a magnetic field which gives off the Dirac's monopoles, are created by means of the electric currents moving along the Dirac's strings. This field is a whirling magnetic field, which is described by the vortex vector $\text{rot}\mathbf{H}$. Thus, the Dirac monopole theory is, in fact, a disguised form of electromagnetic concept Maxwell.

The only good thought which can be learned from this theory Dirac, according to the author of this article, is the assertion that namely the magnetic charges are responsible for the quantization of the electric charges of particles in the structures of mass (atoms, nucleons, substance etc.). Detection by the author of the present article of the real magnetic charges in structures of atoms and substance, is of the simple confirmation

marked above the conclusion of Dirac, in relation a quantization charges of electrons.

Subsequent searches of magnetic poles are based predominantly on the conclusions of Dirac's theory. At the same time, the experimenters adhered to the so called electric technologies and tried to extract the magnetic charges from the substance approximately in the same way as were generally accepted in operation with electric particles. It should be noted that all these numerous and expensive experiments gave only negative the results.

The equation of the process of formation magnetic field under the influence of the electron current in a conductor, which is known as the first equation Maxwell's ($k \mathbf{J}_e = \text{rot}\mathbf{H}$), is the superficial mathematical "photograph" of the famous experiment of Oersted. As noted above, in the framework of the processes of formation of the vortex magnetic field ($\text{rot}\mathbf{H}$) in a conductor with a constant electric current, are implemented successively two different physical process: 1) $k_1 \mathbf{J}_e = \text{rot}\mathbf{J}_g$ and 2) $k_2 \mathbf{J}_g = \text{rot}\mathbf{H}$. It is important to emphasize, that the coefficients k_1 and k_2 in the above equations, in principle, not equal to each other ($k_1 \neq k_2$).

An erroneous electromagnetic concept Maxwell's, which was formulated in the absence of knowledge about the real micro-processes that occur in the body of conductor with a constant electric current, it turned kind of "tombstone" on the ways of the positive development of physical science. This "tombstone" has significantly reduced the interest of physicists at the problem of existence of the real magnetic spinor particles and also proved to be one of the main reasons of appearance of numerous false and even mystic directions in the theoretical (predominantly mathematical) physics. It should be underlined that during all the years that passed, from the moment of Oersted's discovery (1820), the official physical theory so and could not formulate unambiguous and definitive answer to the following question: what is really a direct source of the magnetic field and which physical micro-processes in a conductor with electric current are responsible for its formation.

Namely the vicious EM-concept of Maxwell is responsible to considerable part of the mystique in the physical theory. So, with one hand, the electric spinors, for example, electrons, emit electric field that determined by the strength vector \mathbf{E} . On the other hand, the same electrons in process of their movement in the conductor, within the framework of electric current, creates of the vortex magnetic field, which is described by the axial vector $\text{rot}\mathbf{H}$, according to the generally adopted physical theory of Maxwell. Arisesan impression that the electric particles, especially electrons, are not simple electro-spinors but some kind the electromagnetic "monsters". For example, even in the Big Encyclopedic Dictionary "Physics" (RUS edition of 1999) can read the following: "electric charge-source electromagnetic field" or "electric field is a particular form of the electromagnetic field".

Note 2. By the author of this article had to hear of statements of historians of physical science that Maxwell himself had nothing against magnetic poles (charges) and had even intentionally left for them in place in his EM-theory. But this "place" has not had any impact on the negative consequences that has followed from this theory. Of course,

we can assume that the Great physicist had some doubts and even could to consider his EM-concept as the first approach to reality. But the following generations of theoreticians not very burdened themselves with doubts and have admitted of the defective concept of Maxwell's, as the ultimate truth.

It should be added that such a problem as the existence of true antielectrons, *i.e.* of positively charged electric antispinors in atoms and substance, which was developed by the author, is the result that closely connected with his of many years of experimental and theoretical studies of the real magnetic charges [5] [11].

As mentioned above, the main reason that the real magnetic charges and also the true antielectrons, were “buried alive” in the modern physical science is physics their retention (confinement) in the structures of atoms and substance, which is cardinally different from the confinement of electrons. Very negative role in development of the physical science is played the fallacious electromagnetic concept Maxwell, in which the magnetic field, by mistake, was deprived of its own source, of the magnetic pole or of the magnetic charge.

It is important to note that Journals the “Nature” and “Nature Physics” from 2008 to 2014 published a series of reports about the experimental detection of the so-called collective magnetic monopoles and their currents in the “spin ice” (see, for example, [12] [13]). The magnetic effects which observed in the “spin ice” are manifestations, in our opinion, of the real magnetic particles (magnetons and antimagnetons). However, the authors of the above-mentioned experiments adhered to traditional views, explaining their the results by of the special types of collective electronic states. This last interpretation, again in our opinion, is the result of more than century-long influence on the minds by of vicious concept Maxwell.

2. The Reasons That Was Delayed the Recognition of Real Magnetic Charges, as Well as the True Antielectrons in the Physical Science

A natural question arises: how can the magnetic spinorial particles, which, in the opinion of the author, present in the physical masses (nucleons, atoms, substances, etc.) in about the same quantities as and electric particles, can remain invisible for of physicists more than the hundred years?

There are several reasons of this.

1) In the first phase happened the superficial interpretation of the results of the experiment of Oersted, when only the obvious participants of experimental process were taken into account *i.e.* electric current and the magnetic field around the conductor. This superficial interpretation was admitted by Maxwell as a basis for his EM-theory, ignoring the popular wisdom that “the truth never lies on the surface”. Namely this superficial EM-theory of Maxwell, has launched in of physical science the vicious assertion that magnetism is an emanation of the electricity.

Of course, the magnetic field around the conductor with a constant electric current is a real experimental fact (experiment of Oersted). However, not fact, that this field is di-

rectly produced by electrons. So, for example, with the same “success”, we can conclude that it is an electric current that comes from the power supply to a hair dryer, pushes air out his nozzle, if not to know about the existence of an electric motor and fan and not hear their the noise and vibration. Not there is no doubt that if would be vortexes of magnetic charges, organized in a conductor under the influence of electric current, were able to create noise and vibration, Maxwell would make a completely different conclusion about the true source of the magnetic field.

In reality, all fundamental fields *i.e.* electric field and magnetic field, are generated exclusively by corresponding by poles-spinors, and development and use Maxwell’s EM-concept during 140 years, has turned out to be the most unsuccessful exit from the situation which took place in Physics at the end XIX-th century as a result of the simple and regrettable fact, the absence on that moment, of reliable detection of real magnetic charges.

2) The second and main reason is in difference of nature the bond of electrons and magnetic charges within physical masses (in atoms, substance and so on) what determined by peculiarities of confinement of the magnetic charges in substance and also special features of zone structure of solid bodies with electric and magnetic charges (are noted in the author’s publications [5] [10]).

Basing on his own experiments and also on the results of other researches the author has discovered that magnetons (as and antimagnetons) can’t be torn out of the substances by pumping in it energy. Under increasing the internal energy of the body (the target), has place increase forces retention of the magnetic charges in substance.

The concepts free particle with respect to the electric and magnetic charges, are significantly different. If electric charges, for example, an electrons, can relatively easily extracted from the substance and to fly freely into air space, magnetic charges can’t to leave the substance. The essence of “freedom” magnetic particles consists in the fact that they don’t interact with electric charges inside the substance at any particular moment of time. Free condition of magnetic poles is achieved by deep cooling of the substance (superconducting state). It’s important to underline that only a part of magnetic spinorial particles occupying the so-called a potential zones of conductivity, can be into such a free state. It follows from the above given considerations, in unlike of electric spinors, impossible to extract an individual magnetic particle out of substance and to force her to fly in the space (outside a physical mass).

Let us explain the latter statement.

Figure 2 shows a scheme of location of the levels of magnetic charges and electrons in the condensed state of substance on a scale of energy. It’s well known that the electronic levels be found in a potential pit and for exit of an electron into the state free from links with a substance is necessary to supply him additional energy, for example, warm it.

But since the levels of magnetic charges is located under so-called of the potential cupole, for exit these particles in the free state, a substance must be cooled, *i.e.* necessary to reduce its internal energy. At the deep stages of cooling there arises the super-

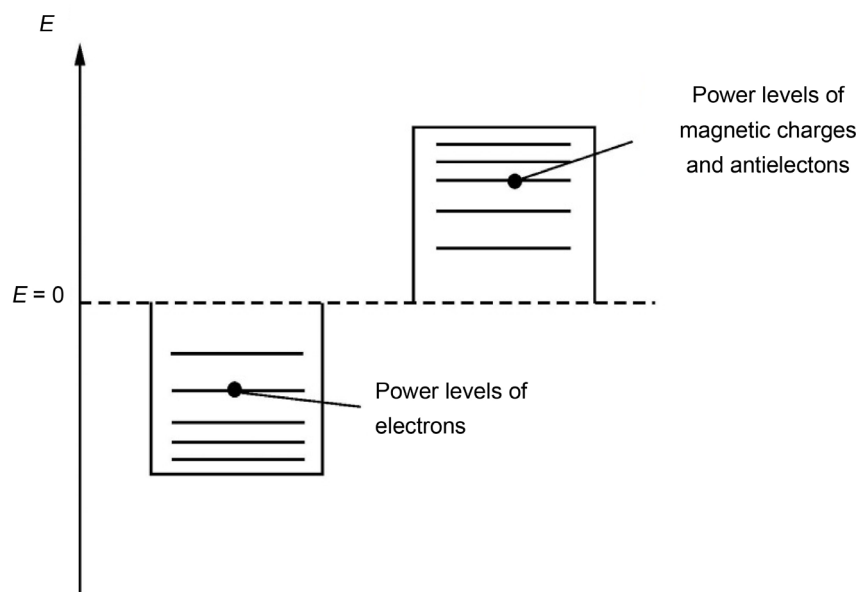


Figure 2. The disposition scheme on the energy scale of levels: of electrons (in the energy “pit”) and magnetic charges (under the energy “cupola”). So, for an electron exit in free state from bond with a substance, it is necessary to increase internal energy of substance, for example, to heat it. The free condition of the magnetic spinorial particles is reached at deep cooling of substance, for example, in the condition of superconductivity.

conductivity effect what probably is an evidence of transition of magnetic spinor particles into the states free from substance bonds with the lattice. In this case, electric current passes through superconductor practically without resistance, since the free magnetic charges rotating around the lines of current, do not experiencing friction about of the lattice conductor. Any energy pumping of substance (irradiation, heating and so on) pushes the magnetic charges on higher of the energy levels.

General physical conditions confinement of the spinor particles and, in particular, of magnetic charges, in within substance, were considered in publications of the author (see [1] [5]) and the most detailed analysis was given in [10].

3) Toreasons that have been outlined above in this section, need to add the reason subjective. In the beginning XX-th century when F. Ehrenhaft began publishing the results of their experiments related to discovery and investigation of magnetic charges, the problems of these particles have not considered as sufficiently important and attractive for the majority of theoreticians. In 1931 P. Dirac again has paid attention to this problem [9]. But as it was shown in the publications of the author, this “shot” of Great theoretician turned out to be “the blank”, since a giant charge of the Dirac’s monopole (the minimum value-68,5 e) has exclude any possibilities of participation of monopole in the structures of physical masses (atoms, substances et al.). For convinced “electricians” the real magnetic charges turned out to be not only redundant but also in some sense harmful, since their existence meant collapse of the theoretical “castles in the air” built without their participation.

3. Electromagnetic Shells of Atoms and Nucleons Are Direct Source of the Vortex Electromagnetic (Gravitational) Field. Paragravitation, Ferrogravitation and Gravito-Levitation

On the basis of his own experimental and theoretical investigations [1]-[6] the author has shown that the atomic shells are electromagnetic but not purely electronic as it is generally accepted, with the number of magnetic particles (magnetic charges) in the shells approximately equal number of electrical particles. Namely electromagnetic shells of atoms are the natural sources (generators) of gravitation field, which in really is a vortex electromagnetic field. The elementary source of the gravitational field is the spinor electromagnetic quasi-particle which was given to the author's name S-Graviton (S^- source). Composition of the S-Graviton: two spinors (electron and magneton) and two antispinor corresponding to them. Electric and magnetic charges coexist in composition of the S-Gravitons in the form of the appropriate bispinors or spinor dipoles. Figuratively speaking the S-Graviton is a combination of electric and magnetic bispinors rotating in antiphase on the same atomic orbit. This quasi-particle can also to associate with two currents of electric and magnetic charges, which are coordinated along phase and circulate on a single atomic orbital.

The model representation of the vortex orbital EM-current, *i.e.* of S-Graviton, given above, should be written in the following form: $\text{rot}[\mathbf{J}_e - \mathbf{J}_g]$, where \mathbf{J}_e and \mathbf{J}_g are vectors of instantaneous density currents of electric (e) and magnetic (g) charges corresponding to their of the vortex (circular) flows. Then the equation of the process of gravitational field formation by S-Graviton can be presented in the form:

$$k \text{rot}[\mathbf{J}_e - \mathbf{J}_g] = \text{rot}[\mathbf{E} - \mathbf{H}], \quad (1)$$

where \mathbf{E} and \mathbf{H} are vectors of instantaneous intensity of electric and magnetic fields in the structure of the **vortex electromagnetic (gravitational) field** and k -the proportionality factor. From the above Equation (1), is obvious that the gravitational field this the electromagnetic vortex field which is characterized by changes in orientation vectors tension of the electric and magnetic fields (\mathbf{E} and \mathbf{H}), which are equal in magnitude and opposite in direction at each point.

Minus signs between the vectors of currents and tensions that exhibited in the above-mentioned equation of the process of formation of the gravitational field, determines the conditions of mutual compensation tensions of electric and magnetic fields in the structure of the gravitational field. In publications [5] [10] it is shown that the such compensation be answer the principle of minimizing the "Dark energy" or the principle of least action.

Vector-vortical analogy between magnetic (a) and gravitational (b) of fields is shows on **Figure 1**. Unlike from vortex magnetic field of every point of which is answered one vector of instantaneous tension of \mathbf{H} , of every point of the elementary gravitational field is responsible two vectors of instantaneous tension of the fields of \mathbf{E} and \mathbf{H} equal by value and oriented antiparallel to each other.

In addition, in **Figure 1** shown, that the magnetic vortex field, which is determined

by the vortex vector $\text{rot}\mathbf{H}$, is formed by the rotating magnetic bispinor or, that too, by means of the rotating the magnetic dipole. The elementary source gravitational field is S-Graviton which can be defined as the dynamic EM-dibispinor, *i.e.* two related bispinor (electric and magnetic), rotating in opposite phase on one atomic orbital. The classical equations of the processes formation magnetic and electromagnetic (gravitational) of fields also shows in **Figure 1**.

If polarization of the vortex vectors $\text{rot}[\mathbf{J}_e - \mathbf{J}_g]$ of S-Gravitons is realized in the structures of physical masses (in atoms, nucleons, substance et al) what is accompanied by polarization of vortex vectors $\text{rot}[\mathbf{E} - \mathbf{H}]$, then by analogy with ferromagnetism, the gravitational fields being emitted by these masses can be called a **ferrogravitational** fields.

The gravitational field, which is generated by masses in the absence of polarization of the vortex vectors $\text{rot}[\mathbf{J}_e - \mathbf{J}_g]$ in their structures, is a tensor or quasi-scalar field. And again, by analogy with magnetism, such field can to define as **paragravitational** field.

We write the mathematical expressions that determine the states of the **ferro- and paragravitation**. So, gravitational fields corresponding vector condition: $\langle \text{rot}[\mathbf{E} - \mathbf{H}] \rangle \neq 0$, by analogy with the ferromagnetism can be called **ferrogravitational fields** (FGF) and the fields corresponding to the condition: $\langle \text{rot}[\mathbf{E} - \mathbf{H}] \rangle = 0$, by analogy with the paramagnetism can be called **paragravitational fields** (PGF).

The Physical Masses (nucleons, atoms, bodies), which form paragravitational field, exhibit so-called **attraction** or **gravitation** to each other. The physical masses forming ferrogravitational field will push off from masses—sources of paragravitational field, what constitute the discovered by author present article **gravito-levitational effect** or **gravito-levitation** [14] [15].

Note 3. It's important to notice that results of experiments of the author with magnetic charges and their currents in superconductors allowed it to develop a technology of receiving a technical ferrogravitational field (FGF). Technical FGF and levitational forces induced them, can be used in transport, load-lifting and space techniques, in power engineering and also in numerous the gravitophysical and gravitochemical technologies (see a publications author [15] [16] [17] [18]).

The first the theoretical grounded tests on the experimental generation of gravitational field with using rotating superconductors, that gave positive results, were performed by the author of the present article as far back in the 1979-1981 [1] [5]. In the following years the author had discovered gravitational phenomena by passing joint currents of magnetic and electric charges through static superconductors. The results of these last tests are expounded in the books of the author in Russian language [5] [6].

It's important to note, that the results of our gravitational experiments are in excellent concordance with experiments of Podkletnov E. and Nieminen R. [19] and also with experiments of Tajmar M. and de Matos C. J. [20] in which, in our opinion, the experimental gravitational field was also discovered. Unfortunately under interpretations of observed effects, they were explained: in work [19] as a manifestation of anti-gravitation, and in the article [20] as a manifestation of the so called gravitomagnetic

field, because their authors had no idea about presence real magnetic charges in the structures of atoms and substances. It should be noted that definition of the gravitational field as gravitomagnetic, given in [20] has relation to physical reality, since as magnetic field, so and gravitational field are the vortex fields and are described by vortex vectors: $\text{rot}\mathbf{H}$ -magnetic field and $\text{rot}[\mathbf{E} - \mathbf{H}]$ -gravitational field.

In his publications the author permanently underlined that without introduction of real magnetic charges into basic physical concepts it's impossible to unblock approaches, for example, to such important spheres of science and engineering as experimental and technical gravitation.

Research author of this article showed, that namely the atomic-shaped structure, which includes the electromagnetic shell and the nucleus, is a prerequisite for ensuring the ability to the emission of gravitational field. Consequently, all varieties of mass which, in the opinion of the author, necessarily structured in atomic-shaped form, can be defined as the Gravito-forming structure or GFS.

Thus, for example, the nucleons this "small" atoms with their own shells and nucleonic nucleus. Under this, the shells of nucleons is necessarily electromagnetic, *i.e.* they is formed by the nucleonic S-Gravitons. Electric and magnetic spinors and antispinors in the compositions of the nucleonic S-Gravitons have lower values of charges than the charges of particles in the shells of atoms.

The processes of formation the gravitational field, which define by the vortex vector $\text{rot}[\mathbf{E} - \mathbf{H}]$, and also the magnetic field which is determined as $\text{rot}\mathbf{H}$, in the structures of the nucleons, analogous to the processes of formation these fields in atoms (see **Figure 1**). For example, so-called magnetic moment of a neutron is formed by the magnetic bispinor, which, like of atomic conditions, take up seats on one of the external orbital of the nucleonic shell.

4. The Essence of the Physical Mass

Since 2001 (publication [1]) the author has been proving in all his publications that such a structural formation as Physical mass (PM), for example, atoms or nucleons are dynamic spinor EM-complex, consisting of four independent fundamental particles: two spinors (electric and magnetic) and two antispinors corresponding to them. Without such a quartet physical mass can't arise. A person with a developed of figurative thinking, can imagine a physical mass like "car", each of four the wheels which should be associated with one of the above-indicated spinors and antispinors. But modern mathematical Physics acknowledges only one "wheel"-electrical spinor from the four above mentioned "wheels", that is only material particles with electric charges and practically doesn't take into account other three particles. Definition of mass taken from the Encyclopedic dictionary "Physics" can serve as illustration of such a state of affairs and has the following form: "mass is a physical value and one out of characteristics of matter, determining its inertial and gravitational properties". The results of the author's investigation have shown that the concept of real mass assumes totally different physical content.

Physical Mass (PM) this of EM-structure, consisting of material and antimaterials-prior particles, whose characteristic feature is the ability to radiation the gravitational field and of the photons. Consequently, the Mass may be considered as the Gravitational-forming structure (GFS). The fundamental “brick” of the Mass and basic source of the gravitational field is kept open by the author an EM-quasiparticle, which is called S-Graviton. S-Gravitons realized usually in such the atomic-shaped EM-structures as, for example, atoms, nucleons, substance and other. Varieties of Mass are: positron, muon and heavy lepton. It is important to note that a material particles such as neutrino are massless. Massless are and such material particles, as the electron and magneton, so as Mass is result of their joint structural “activity” with the corresponding particles of Antimatter. Thus, Matter in the form electric and magnetic of spinors, and Antimatter in the form of appropriate antispinors, in without fail, make up the compositions all varieties of Mass. However, it is important to emphasize that Mass and, for example, the Matter, completely different physical categories. Mass is the electromagnetic form or the structural frame, which unites the spinors and antispinors and manifests such effect, typical only for the Mass, as emission of gravitational field.

Mass exhibits the properties of inertness, however, this property is relevant only to particles of Matter and Antimatter in the compositions of Mass. Therefore, the conventional definition of Mass as measure of inertia is not physically accurate, since the true bearers of inertia are the amounts of Matter and Antimatter in the composition of Mass. In this regard, you must enter the logical clarification in the formulation of Newton’s second law, where in the equation $F = ma$ under mass (m) should be kept in mind the combination: Matter and Antimaterial in the composition of the mass, *i.e.* $m = M + AM$, where M is the amount of Matter, and of AM -amount of Antimatter.

Note here that the known principle of equivalence is performed exclusively in the framework of PM, although not in all its varieties. Outside of PM, this principle does not make sense, because, in this case, there is no source of the gravitational field. Note also that, in light of the foregoing, such terms as “inertial mass” or “electron mass”-complete physical nonsense.

It should be noted that all known varieties of Mass (atoms, nucleons, substance, etc.) should be called EM-masses so as they are formed from particles, the constituents the block of electromagnetic particles. The question of the existence, so-called weak the Masses, which could be formed by weak spinors and antispinors, remains open.

5. Physical Triad and “Dark Energy” in the Real World

The results of years research of the real magnetic spinor particles allowed the author to formulate the conception of the Physical Triad (PT), according to which the real World consists of three fundamental phases: Matter, Antimatter and Energo-medium [10] [18]. Phases Triad are self-sufficient, and their conservation laws preclude any mutual transformations between particles of different phases. For example, the law of conservation of Matter, preclude a existence of any pre-Matter particles, from which then formed the true particles Matter. Particles of Matter can be only converted in the ma-

terial particles with more or less significant content of Matter in them. All material particles are spinors, and antimaterial particles-antispinors. Spinors and antispinors referred to as the General title: the spinor particles.

The particles Antimatter constitute approximately half all of the real spinorial particles, *i.e.* charged particles in the World, and their absence in the physical representations is determined by the Physics their retention in substance or conditions of their confinement. The law of conservation of Antimatter eliminates any possibility for transformation of antispinors in particles of other phases of the Physical Triad, answering the law of conservation of Antimatter in the real World. The process of pair annihilation: spinor-antispinor, is accompanied by a strong compression (pressing) of these particles to one another by forces “Dark Energy” and, in principle, not lead to the humiliation of the particles. In such processes is only possible transformations, for example, antispinors in other antispinors with great or less quantities of Antimatter in them.

As shown by the author in his numerous publications (see, for example, [1] [6] [10]) all true spinor particles in the real World are massless. It is important to note that namely as a result ignoring of the real magnetic charges in the physical theory, were closed all reasonable approaches to clearing up the essence of Physical Mass.

Ergo-phase (Ergo-medium, Power-medium) is a global phase, which executes all acts of force on the particles and masses in the real World. In the basic (undisturbed) state the Ergo-phase is an isotropic high-density gaseous (possibly also quasi-liquid) medium formed by its own spinless and massless fundamental particles—energions. Energions are very small, they move in all directions at speeds close to the speed of light and can only be of two types: the Left (ϵ_L) and Right (ϵ_R) energions, that should be linked with the appropriate direction of their own rotation. General state of energions within the Ergo-medium is determined as doubly degenerate. Superhigh mobility and inertialess behaviour of energions allow the particles and masses to move relatively freely in the Ergo-medium when this medium is in basic (undisturbed) state.

Note 4. Can assume that if energions, *i.e.* particles of Ergo-phase, stop moving, all spinor particles and masses, including planets and stars, will be “concreted” in a static world environment. Such a scenario can be defined by the term of “exotic death of the Universe”. Fortunately, this can’t be, because not can be never, because the main properties of the Universe are: the **Eternity** and **Infinity**.

According to the Physical Triad Concept all the forces that acts in the real World are executed by Ergo-medium through a contact pressure her own particles-energions on the spinor particles and consequently on the masses (bodies). Forces direct action on the particles and masses, which are implemented in the Ergo-phase are the forces of the so-called “Dark Energy”, which represent the zones of nonequilibrium States in the Ergo-medium in the form of oblasts of local pressures which are creating particles-energions. The formation of “Dark Energy” in the Ergo-medium is induced by spinor fields, *i.e.* fields of charged particles. In so doing all variety of spinor fields in-

cluding gravitational fields don't have any real a power significance. They only play the role of intermediaries exerting influence on energy-state of the Energo-medium and inducing formation of "Dark Energy" in it.

Namely "Dark Energy" is real forces factor, performing the whole dynamics of particles and bodies, as the scale of the Universe (the movement of galaxies, stars, planets and other objects) so and in the microcosm, for example, the dynamics of spinor particles within a physical mass, such as in atoms, nucleons, etc. In detail, the concept of Physical Triad of the real World contained in two editions of the author's book [10], and reviewed in [18].

Note 5. Since "Dark energy" is induced in the Energo-medium by means of spinor fields, *i.e.* fields of charged particles, her effect on particle and masses, can be formally attributed to the effects of spinor fields, which induce certain types of "Dark energy". Lower, in this article, will be considered a variety of the power influences on the particles and masses, which are carried out by the "Dark energy". In order to reduce the volume of the article, we shall henceforth refer to these effects, by behalf of spinor fields, at the same time bearing in mind that in this case is the place the action of "Dark energy".

6. The Configurations (Electromagnetic Formulas) of Atomic Shells and the Periodic System of Elements

According to the author's conclusions, which he did on basis his many years of experimental and theoretical studies, all electrons existing in atomic shells are included in compositions of S-Gravitons. Shells so-called of the magnetic atoms, besides S-gravitons, contain the magnetic bispinors, that occupy 3d and 4f orbitals. Such atoms are, for example: iron, cobalt, nickel, gadolinium etc. The magnetic bispinors in the existing theories have been mistakenly replaced by such theoretical prostheses as of "unpaired" or "magnetic" electrons. Namely these bispinors determine all of the atomic magnetic manifestations, as well as have a significant impact on the chemical bond as in the simple substances, so and in various chemical compounds.

Since all the electrons in the compositions of the atomic shells are structural components of S-Gravitons, *i.e.* are involved in the formation of the gravitational field, is fair the prediction of D. Mendeleev regarding the significance of the weight characteristics of the elements as basis for the formation of the periodic system of elements. Meanwhile a Mendeleev had no idea nor of the S-Gravitons nor about the real physics of the gravitational field. However, namely the S-Gravitons, that determine the gravitational interactions of atoms with Earth, have been intuitively laid by Mendeleev in his periodic system. It should be noted that the term "electromagnetic nature of the atomic shell" applies only to the S-Gravitons, so as the union of electric and magnetic charges takes place namely in the compositions these of spinor quasiparticles.

In the framework of modern ideas of atomic physics, the fundamental is the assertion that the elements are arranged in the periodic table is not so much in increasing order their atomic weights, as in order of increasing charge of their nuclei. The last statement

is impossible to deny, since the charge of the nucleus is always equal to the total charge of the electrons in the atomic shell. However, if we take into account the results of researches of the author of this article, associated with the electromagnetic device of atomic shells, the statement about the primacy of the weight values of the elements in the organization of the periodicity of their properties, returns to its original, *i.e.* to the Mendeleev's hypothesis. However, all this is within frame of age-old question of what is primary: chicken or the egg?

Next consider the forms record (electromagnetic formulas) for the electromagnetic atomic shells. According to research by the author, in the atomic shells, which in reality are electromagnetic, a place each electron by occupies such the electromagnetic quasi-particle as S-Graviton. In this case to the notations of each electron on respective of levels and sublevels, must be attributed the symbols "G", pointing to the electromagnetic nature of the quasiparticles, *i.e.* S-gravitons, which replace each electron in the atomic shell.

So recording of the electromagnetic configuration or the electromagnetic formula of the hydrogen atom will have the following form: $1s_G^1$, which means the existence in the shell of the **hydrogen** atom of one S-graviton, instead one electron. Recall that in the composition this quasi-particle: two the electric spinor particles (the electron and antielectron) and two magnetic (magneton and antimagneton with charges g^- and g^+). Magnitudes of the charge of the particles in the atomic shells meet the condition: $e = g$. The real structure of the hydrogen atom can be represent if in **Figure 1(b)** mentally deliver proton in its center. In detail, the actual device the shell of hydrogen atom, given by the author in the publications [11].

Electromagnetic configurations of the atomic shells of **helium** and **beryllium** should be written as: $1s_G^2$ and $1s_G^2, 2s_G^2$. Since in these configurations are realized exclusively S-Gravitons, which replace all the conventional electrons, the number of spinor particles in the shells of helium and beryllium is, respectively, 8 and 16, in equal parts between the magnetic and electric charges.

Recall also, that the magnetic and electric charges are included in the S-Gravitons in the form of appropriate bispinors. The last statement applies to the basic *i.e.* undisturbed state of the atoms. Thus, according to the author, it is possible, as a first approximation, to record the electromagnetic formulas of all elements with filled, of so-called, the "electronic" shells assigning for each level and sublevel the index "G", that corresponds of replacement of each electron on S-Gravitons.

As for the situation with unfilled shells, there is a need to introduce in the recording configurations additional components in form magnetic bispinors that fill these shells until they are completely filled. Namely magnetic bispinors, not fictitious, so-called "unpaired" or "magnetic" electrons, are the real sources of eddy magnetic fields, which are described as $\text{rot}\mathbf{H}$. These magnetic fields in existing theories, in the "absenc" of real magnetic charges, were replaced by such fictitious concepts as the magnetic moments. Magnetic bispinors, designation which can be as **mb**, implementing in the shells the so-called of magnetic atoms (iron, nickel, cobalt and others.), filling in them the shell

3d. Furthermore, the magnetic bispinors occupy 4f shells, what and determines the atomic magnetism of rare earth elements.

Next, we write the electromagnetic formula of the **iron** atom, with the inclusion in his 3d shell four of the magnetic bispinors (on the number of the “unpaired electron spins”): $1s_G^2$, $2s_G^2$, $2p_G^6$, $3s_G^2$, $3p_G^6$, $3p_G^6 + (4)_{mb}$, $4s_G^2$. The symbol “(4)_{mb}” in the 3d shell means that in the composition of the shell of the iron atom, in addition to S-Gravitons, there are still four magnetic bispinors on four of the so-called of “unpaired electrons”. Considering the compositions of S-gravitons and bispinors it is easy to calculate that the total number of spinor particles in the shell of the iron atom is 112. In this composition: of electrical particles 52 and the magnetic particles 60.

Given that realized only two types of the spinorial quasiparticles in electromagnetic shells of atoms: S-Gravitons (designated in the formulas by symbol “G”) and magnetic bispinors (indicated by the symbol “mb”), then in the electromagnetic formulas such shells can and omit the symbol “G”, if at the same time to remember that the respective sub-levels are populated not of electrons, but electromagnetic quasi-particles, *i.e.* S-Gravitons.

In accordance with the rules of the author on filling the atomic shells, can write the electromagnetic formula of shell of the rare earth **gadolinium (Gd)**. According to the existing theory, the 4f shell Gd involves seven, so-called, the unpaired electrons: $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^6$, $4s^2$, $3d^{10}$, $4p^6$, $5s^2$, $4d^{10}$, $5p^6$, $6s^2$, $4f^7 + (7)_{mb}$, $5d^1$. In shell Gd there is a 270 of spinor, *i.e.* charged particles. Of them in the compositions of the S-Gravitons: 256 magnetic and electric charges, by 128 those and other, plus 14 of magnetic spinor particles in compositions of seven magnetic bispinors (*i.e.* one bispinor on one of “unpaired electron”). These magnetic bispinors that localized in 4f shells, are responsible for the so-called the magnetic moments in the atom of gadolinium. Thus, having the information on the number of the unpaired spins or so-called “magnetic electrons” and their localization, can create a complete configuration (electromagnetic formula) shells of atom of any element.

As is known, a states of the electrons in the atoms are determined by four quantum numbers: **n**, **l**, **m_l** and **m_s**. In addition, in the construction of the configurations of atomic shells is necessary to consider the Pauli exclusion principle and Hund’s rule. But all this was invented for a pure electron shells.

In details, the conditions quantization of the particles in the compositions of the electromagnetic shells of the atoms, remains to be seen. This problem is complicated not only by the fact that there is increase in the number of particles in of the atomic shells and their of the charged diversity. The author shows that the particles that make up the electromagnetic shell of atoms, are included in the structures of such of the spinor associations (of spinor quasiparticles), as the S-Gravitons and the magnetic bispinors. It is possible that the emphasis in studies of quantum states particles in the electromagnetic shells of atoms, should be transferred with the quantization of individual particles on the quantum states of their associations, *i.e.* on quasiparticles such as S-Gravitons and magnetic bispinors.

The mutual orientations of the vectors of elementary gravitational fields emitted by each S-Gravitons in the linked pairs, can be written in the form $\pm \text{rot}[\mathbf{E} - \mathbf{H}]$. Then the S-gravitons in the couple, who lives on the same atomic orbital, will differ only in the signs + and - of the vortex vectors $\text{rot}[\mathbf{E} - \mathbf{H}]$. Consequently, marked + and - signs that refer to a pair of S-Gravitons, occupying one atomic orbital, suppose possibility of replacing the quantum number \mathbf{m}_g on quantum number \mathbf{M}_G . The quantum number, \mathbf{M}_G is called gravitational quantum number, since it is directly related to the orientations of the vortex vectors elementary gravitational field emitted by each of S-Graviton.

The quantum numbers \mathbf{N} , \mathbf{L} , and \mathbf{M}_L determine the quantum states of S-Gravitons in the electromagnetic shells of atoms, which are completely filled by these quasi-particles.

Pauli exclusion principle for electromagnetic shells of atoms, in this case, can be determined as follows: two or more S-Gravitons can't simultaneously be in the same quantum state, i.e. to have the same quantum numbers: \mathbf{N} , \mathbf{L} , \mathbf{M}_L and \mathbf{M}_G .

It should be noted that the aforementioned quantum numbers can be used exclusively for the construction of the atomic shells comprising S-gravitons, because by structural "bricks" here are only the identical S-Gravitons

We turn to the magnetic bispinors that enter as components in 3d and 4f atomic shells of transition and rare-earth elements. For the distribution of the magnetic bispinors in the shells of these of atoms, to a first approximation, can be use the quantum numbers: \mathbf{M} , \mathbf{L} , \mathbf{M}_L , that and under the distribution of S-Gravitons. However, by these quantum numbers should be assigned index: "mb", i.e. \mathbf{M}_{mb} , \mathbf{L}_{mb} and \mathbf{M}_{Lmb} . It is also important to note that the values of the quantum numbers that characterize the S-Gravitons and magnetic bispinors in atomic shells, can vary significantly.

Gravitational quantum number \mathbf{M}_G to the magnetic bispinors not have relationships because they are the sources of the magnetic field (not gravitational) and which describe with the aid of the magnetic vortex vector $\text{rot}\mathbf{H}$. For magnetic bispinors, inhabiting the atomic shells, we must use the quantum number \mathbf{M}_H , which is called the magnetic bispinor number. This last the quantum number corresponds of the two coupled magnetic bispinors, living on one the atomic orbital and differing by signs + and - of magnetic vortex vectors $\text{rot}\mathbf{H}$.

In general, under the analysis of quantum states of particles in electromagnetic atomic shells with S-Gravitons and magnetic bispinors, have to use eight quantum numbers: four numbers for S-Gravitons and four for the magnetic bispinors.

Hund's rule, for of the electromagnetic atomic shells, should be formulated as follows: the total value of the gravitational quantum number (\mathbf{M}_G) S-gravitons for the concrete underlayer should be the maximum. Similarly, apparently, it is possible to formulate a rule Hund and for magnetic bispinors, with the difference that in this case, you shod use quantum number \mathbf{M}_H .

Note 6. The author notes that the mechanical transfer a conditions of the Pauli exclusion principle and the Hund's rule, which had been invented solely for the electron shells of atoms, on the electromagnetic configurations, is done in the absence of a better option. It is possible that in reality, the conditions associated with the filling of levels

and sublevels of the atomic shells by S-gravitons and magnetic bispinors differ significantly from those that postulated by Pauli and Hund. Furthermore, in Section 6 below, when considering the types of possible interactions between the elements that make up the electromagnetic structures of atoms, arose a conflict which promotes further doubts about the fairness marked Principle and Rule in relation to the actual device electromagnetic atomic shells.

In 80-years the author spent a lot of time and effort trying to find a natural and stable sources of vortex electric field, which is described by the vortex vector $\text{rot}\mathbf{E}$. Findings of these researchs can be summarized as follows:

- In contrast from the magnetic bispinors, the electric bispinors as individual components of the electromagnetic atomic shells, with high probability absent;
- Electrical Manifestations that observed in atomic compounds called ferroelectrics, as it and follows from existing physics, are of electrostatic nature;
- Lack of stable manifestations of vortex electric field and its of natural source, *i.e.* rotating electric bispinors as in atomic structures, so and in different chemical compounds be determined by the characteristics of confinement of the electrons in so-called “Electrical” masses our World.

The conditions of confinement of the spinor particles in the compositions of the Physical Mass were considered in Section 2 of this article.

7. Main Types of the Intra-Atomic and Interatomic Interactions

Presented in this paper the new ideas about real device of atomic shells involves a serious revision of the system of interactions of the atomic quasi-particles (S-Gravitons and magnetic bispinors), both among themselves so and with atomic nuclei. This section will summarize the key types of interactions that are responsible as for the formation of atoms, so and for the formation of atomic condensates.

1) Main interactions, responsible for the formation of atoms, according to the author, are gravitational interactions of the S-Gravitons both with paragravitational fields of the atomic nuclei, so and among themselves. Because the field, emitted by each S-Graviton is the ferrogravitational field, and the fields emitted by of atomic nuclei, is generally, is paragravitational, should be repulsion of the S-Gravitons from nuclei in a result of open by author of the **effect Gravito-levitation** [11].

However, if follow the Pauli principle and Hund rule for electromagnetic shells, under settling of S-Gravitons at the atomic sublevels, should be compensation of signs + and – of gravitational quantum numbers \mathbf{M}_G . In conditions of full compensation of the signs + and – of vectors $\text{rot}[\mathbf{E} - \mathbf{H}]$ in pairs S-Gravitons, the gravitational field emitted by such a pairs will be paragravitational. As proved by the author, as well shown above in Section 3, sources emitting paragravitational field, are attracted to each other (or rather, are pressing to each on other by the forces of “Dark energy”).

At the same time, we can't exclude circumstances where violations occur in a system of mutual antiparallel orientation of gravitational vectors $\text{rot}[\mathbf{E} - \mathbf{H}]$ of S-Gravitons in pairs, *i.e.* violation of conditions $\langle \text{rot}[\mathbf{E} - \mathbf{H}] \rangle = 0$, which are responsible paragravita-

tional field. In this case, S-Gravitons will be located at this distance from the nucleus, which ensures the balance of forces of gravitational attraction and repulsion. It may well be that the rule is Hund, in the portion of the electromagnetic structures of the atomic shells is not performed in full.

Confirmation of the above violations are, for example, the manifestations of the volatility of atoms gaseous of helium. Two S-Gravitons in the filled s-shell of atom helium, in theory, should be fully compensated, and the gravitational field emitted by this atom should be paragravitational. However, a well-known effect of the volatility of helium. The author conducted experiments to elucidate the nature of volatility atoms (molecules) gases on example volatility of hydrogen gas. These simple and obvious experiments showed that the hydrogen rises upwards under the influence of the paragravitational Earth field [5] [16], that is under the impact of the **Gravito-levitational forces**. It should be noted that the involvement of Archimedes to explain the volatility of the atoms of light gases (hydrogen, helium, and others), according to the author, is very primitive and harmful speculations.

2) Next, we consider the possibility of a direct electrostatic interaction between the electrons belonging to the compositions S-gravitons, with electric charges of the nuclei. It is important to note that in this case the electric field which is emitting of the rotating electric bispinor, in full must be in composition of the gravitational field emitted by S-graviton. Therefore, it is not very clear is possible in reality, to snatch a static field of an individual electron from the gravitational field of the S-graviton, for the implementation of the electrostatic interaction with the electric charge of the nucleus? However, is an experimental fact that the number of electrons in the atomic shells is strictly corresponds to the magnitude of the charge of the nucleus. Last, persistently suggests the possibility of a direct electrostatic interaction between the shell and nucleus.

The resolution of this issue can be found, if we assume that the number of atomic electrons strictly determines the number of possible S-gravitons in the composition of the atomic shell. Can suppose that the formation of S-gravitons realizable directly in the field of nucleus, and thus, the electrostatic interaction between the electron and the nucleus manifests as a necessary condition the formation as of the atom so and S-gravitons in its shells.

After the formation of the S-gravitons in the atomic shell, the fields of electrons are included as part of a gravitational fields, what is replaces the electrostatic interactions with the core on the gravitational interactions. It is important to note that on small distances (fractions of Angstrom) the manifestation of the forces of gravitational interaction practically has not been studied. However, it is possible that at such distances the forces of gravitational interactions are comparable to the forces of electrostatic interactions.

As a proof of the last statement can serve the forces bond of the nucleons in the nucleus, the Nature of which, according to the author, in basically determined by of gravitational "Dark energy". The real Nature of the nucleonic gravitational fields and the Physics of the binding forces of nucleons in nuclei was noted above in Section 3. A de-

tailed analysis of the strong interaction of nucleons in nuclei, which is realized under the influence of the gravitational “Dark energy”, is given in the author’s publications [10].

3) In accordance with the physical logic presented above, in the basic (undisturbed) state of atoms the direct electrostatic binding forces as between the quasiparticles, constituting atomic shells, so and between them and the nucleus, are hardly probably. However, the same cannot be said relative to the perturbed atomic states. The perturbed States of the atoms are characterized by manifestations of ionization in the systems of spinor particles, as in of S-Gravitons, so and, if any, in of the magnetic bispinors.

These disturbances can affect the structured state of the atomic shells. In addition, perturbed the states of the atoms have a significant influence on the processes of formation of chemical compounds. Striking evidence of such effects can serve the ionic crystals. In this case to of gravitational forces bond between atoms, be added the forces of electrostatic “Dark energy”. In articles of the author [5] [6] [10], and in this article, is constantly emphasized that as a basic and permanent factor of the bond between atoms in different atomic condensates, is implemented, primarily, the gravitational interaction. If all this is express more precisely, so under the influence forces of the gravitational “Dark energy”. The actual lack of this important factor of the chemical bond in modern theoretical physics is explained by the lack of clue about the real physics of the gravitational field. In turn, this the last “blunder” is determined by unintentional neglect of theory to the real magnetic charges, which are the immediate sources of the magnetic field, and also are the mandatory structural components in atoms and substance.

4) To all of the above described that relates to the real physics of interactions within the atoms and their condensates, it should be noted also the magnetic interaction. This latter interaction manifests itself in the so-called magnetic atoms (iron, nickel, cobalt, gadolinium, etc.). According to research by the author, behind the concepts of “the magnetic moments electrons” in of the atomic shells, are hiding the real magnetic charges. These charges in the compositions of the rotating magnetic bispinors, that populate 3d and 4f-orbitals in magnetic atoms, were “buried alive” under false notions of the magnetic moments.

This conclusion of the author, allows to explain the results his of the neutron diffraction studies [2] [3] in which was observed the displacement of density the so-called of the magnetic moments of Fe^{3+} ions from their nuclei in structures of the hexagonal ferrites.

The critics of his model representations are reminded, that “the magnetic electrons” move in such a way can’t, and they absolutely right. In the marked displacements from nuclei in the investigated ferrites, participate not electrons, and exclusively the magnetic charges. Since the magnetic bispinors are able to emit only the magnetic field, they not included in the systems of gravitational interactions. Thus, the nature interactions of the magnetic bispinors in structures of magnetic materials differ significantly from

interactions S-Gravitons. Can expect that the retaining forces of the magnetic bispinors in atomic shells much weaker than the forces that hold the S-Gravitons. Thus, the internal fields in crystals, which are realized as a result of cationic substitutions in some of the magnetics may, as shown in [2] [3], to cause anomal displacements of the magnetic bispinors away from of atomic nuclei.

8. Conclusions

The disregard by the physical science, for nearly 200 years (since the discovery Oersted in 1820) of existence of the magnetic spinor particles (magnetic charges) and also true antielectrons in the structures of the physical mass (atoms, nucleons, substance and other) turned out to be extremely harmful both for Physics so and in General for the natural Sciences. The main reasons which prevented the recognition of these fundamental particles discussed in detail in numerous publications of the author, as well as given in Section 2 above. “The lack of” magnetic charges and true anti-electrons in the physical representations forced theorists to look for a suitable replacements (theoretical “prostheses”), which can help them explain many magnetic and electromagnetic phenomena observed experimentally.

Namely, theoretical prostheses such as the magnetic moments, helped “to close” in physical theory such serious theoretical problem, as the true nature of magnetism. In addition, in the author’s publications (see [6] [11]), it is shown that namely by the theoretical prostheses are a “holes” of the Dirac and his the famous magnetic monopole.

According to the author, should be attributed to theoretical prostheses and proposed in the publications [12] [13] the collective magnetic monopoles, which, is supposed, are responsible for all the magnetic manifestations in the compounds with the structure of the spin ice. Feature in the description of the last magnetism is that the magnetic field in of “spin ice” is created not by the electric current, as in Maxwell’s concept, but only by means of electron spins. In other words, the forward movement of the electrons under the formation of the magnetic field, was replaced of them a twisting motion.

However, the most harmful for science and technology was the invention and introduction in notions of the model purely electronic shell of the atom. It seems that there is no need to explain the last statement, since the atom is for us is of the fundamental physical essence. A distorted view of the compositions of atomic shells caused great harm of the natural Sciences, and also significantly put the brakes on the promotion of world scientific and technical progress.

Of course, the model of the electron shell of atoms this is of a grand theoretical “puncture”, but should be aware that first place on the harmfulness in Physics is necessary all the same to give of C. J. Maxwell and his fallacious electromagnetic concept. Namely vicious EM-concept of Maxwell, which is called in publications author as vicious virus “Maxwell”, can to associate with the “cancerous” an education in “body” of theoretical physics, the “metastasis” which, pierce through many directions of physical science, giving them a false and even mystical significance. Among such directions,

other than those listed above may be mentioned, for example, such resonance theoretical constructs as global expand Universe, very big explosion and a big gap, the field and the Higgs boson, the representation of the gravitational field in the form of a curved four-dimensional space, and many, a lot others.

The author hopes that common sense finally will win over the harmful thinking of “electricians”. Just because is impossible still 200 years old, while ignoring the real magnetic charges and common sense, be faithful to the erroneous electromagnetic teaching of Maxwell and vicious belief that the mechanical movement of electric charges and the spin of electrons, capable replace a such natural source of the magnetic field as the magnetic pole or magnetic charge. Common sense, the author’s opinion, is the act of last hope, since of the experimental evidences of the existence of real magnetic charges in the atoms and substance, by now, has accumulated more than enough.

Note 7. Base provisions of the General Physics with real magnetic charges, developed by the author, were presented at the international PIERS 2009 Moscow Conference (Progress in Electromagnetics Research Symposium ([21] [22])).

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Appendix

The main physical parameters of magnetic spinor particles forming together with electrical particles the atomic shells.

Charge: The magneton (magnetic spinor) and the antimagneton (magnetic antispinor) have a magnetic charges g the value of which is equal to the value of the electron charge ($g = e$). Researches of the author showed that the greatest possibility charge of a fundamental magnetic spinor particle is equal to electron charge, *i.e.* $g_{\max} = e$.

Sign of the charges: Like an electron a magneton has a charged with the sign “minus” (g^-). Sign charge antimagneton-“plus” (g^+).

Mass: Like an electron a magneton and antimagneton are a massless particles, because the physical mass is result of joint structural “activity” of electric and magnetic spinor particles.

Class of elementary particles: The magneton is a lepton and an antimagneton-an antilepton.

Statistical properties: The magneton is a fermion (spin equal $1/2$) and the antimagneton-an antifermion (spin equal $-1/2$).



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