Quantum energetics. Theory of Superunification. Contents

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Publications:

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Download free. Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification, 2010. http://leonov-leonovstheories.blogspot.com/2018/04/download-free-leonov-v-s-quantum.html [Date accessed April 30, 2018].

Product Description

Quantum energetics is based on new fundamental discoveries of quantum of space-time (quanton) and super-strong electromagnetic interaction (SEI) made by Vladimir Leonov in 1996. On the basis of new fundamental discoveries the theory of Superunification of fundamental interactions of electromagnetism, gravitation, nuclear and electro-weak forces is completed. It is important that new fundamental discoveries have the widest practical application in the development of quantum energetics. It is discovered that the single source of energy in the Universe is the quanton in the structure of quantized space-time, which is the carrier of super-strong interaction (SEI). All known methods of energy generation (chemical and nuclear reactions etc.) are reduced to the release and transformation of SEI energy. Quantum energetics is a more general concept in energetics, which includes both the new energetic cycles, and traditional ones, including nuclear energetics.

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1 Fundamental discoveries of the quantum of space-time (quanton) and superstrong electromagnetic interaction

Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 1-67 pages.

Fundamental science has accumulated a sufficiently large amount of knowledge to support the very fact of the discovery of the space-time quantum (quanton) and superstrong electromagnetic interaction (SEI). The concept of Superunification was formulated by physicists. Many physicists do not doubt that electromagnetism, gravitation, nuclear and electroweak forces are the manifestation of the united origin. The concept of the unified field was formulated

by Einstein and he devoted 30 years to the development of this concept in the path to unification of gravitation and electromagnetism. He succeeded within the framework of the general theory of relativity (GTR) to combine space and time into the single space-time substance. Already at the end of his life, Einstein concluded that it is necessary to use discrete approaches to the problem of space-time and unification of the interactions within the framework of quantum theory.

There are various approaches to solving these problems in theoretical physics. This also concerns the problem of unification. We can go along the path of finding some universal formula (or a set of formulas) describing the fundamental interactions by mathematical methods, or along the path of finding a universal unifying particle. The alternate path was less attractive to investigators because physics did not know such a particle and the possibilities of discovering this particle were not clear. However, this second approach has been selected in the path to unification of interactions. This also determined the logics and expected success.

2. Electromagnetic nature and structure of cosmic vacuum

New fundamental discoveries of the space-time quantum (quanton) and superstrong electromagnetic interaction (SEI) determine the electromagnetic structure of quantized space-time. The quanton is a complicated weightless particle which includes four charges – quarks: two electrical ($+1e$ and $-1e$) and two magnetic ($+1g$ and $-1g$) linked by the relationship $g = C_0 e$.

2.5. Conclusions for chapter 2

New fundamental discoveries of the space-time quantum (quanton) and superstrong electromagnetic interaction (SEI) determine the electromagnetic structure of quantized space-time.

The quanton is a complicated weightless particle which includes four charges – quarks: two electrical (+1e and −1e) and two magnetic (+1g and − 1g) linked by the relationship $g = Ce$.

The quanton is the carrier of electromagnetism, space and time, and a carrier of strong electromagnetic interaction. The process of electromagnetic quantization of space is associated with filling of its volume with quantons. The quanton diameter determines the discreteness of the quantized space-time of the order of 10^{-25} m.

When analyzing the electromagnetic perturbation of the quantized space-time, the nature of electromagnetic phenomena, the laws of electromagnetic

induction, Maxwell equations and Pointing vector have been described for the first time.

The electromagnetism of quantized space-time is fully symmetric and determines the transfer of electromagnetic energy in accordance with the Maxwell equations. The nature of rotors in the electromagnetic wave has been determined.

It has also been shown that as we move deeper, initially into the region of the microworld of elementary particles and the atomic nucleus $\sim 10^{-15}$ m and subsequently into the region of the ultra-microworld $\sim 10^{-25}$ m of the quantized space-time, we encounter higher and higher energy concentrations. The energy capacity of the quanton is colossal and estimated at 10^{73} J/m3. This is sufficient to generate a universe as a result of a big bang in activation of 1 m (3 degrees) of vacuum.

I   t has also been found that the electromagnetic perturbation of the vacuum is described by a simple equation: $x = -y$ which can be expanded into the main equations of the electromagnetic field in vacuum. The displacement from the equilibrium deposition of the electrical x and magnetic y charges – quarks inside the quanton disrupts the electrical and magnetic equilibrium of the quantized space-time. Real bias currents were found in the electromagnetic wave.

Inside the quantized space-time we can find an electromagnetic string or a superstring of quantons which determines the colossal tension of the quantized space-time. Taking into account the fact that the quanton is a volume elastic element similar to some extent to an electronic clock specifying the rate of electromagnetic processes and time, the quantum not only combines electricity and magnetism but, being a space-time quantum, it combines the space and time into a single substance: quantized space-time.

3. Unification of electromagnetism and gravitation. Antigravitation
Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification.
Cambridge International Science Publishing, 2010, 167-261 pages.

The beginning of the 20th century was marked by the development of the theory of relativity. In the framework of the general theory of relativity (GTR), Einstein laid the foundations of gravitation as the properties of distortion of the space-time, assuming that there is a unified field which is the carrier of electromagnetism and gravitation. In 1996, the space-time quantum (quanton) and the superstrong electromagnetic interaction (SEI) was discovered as the united field which is the carrier of electromagnetic and gravitation interactions. The concentration of the quantons (quantum density of the medium) is the main parameter of the quantized space-time. In electromagnetic interactions the concentration of the quantons does not change and only the orientation and deformation polarization of the quantons change. Gravitation is manifested in the case of the gradient redistribution of the quantum density of the medium, changing the quanton concentration. Electromagnetism and gravitation have been unified within the framework of the quantum theory of gravitation based on the quantum as the unified carrier of electromagnetism and gravitation.

Conclusions for chapter 3

The unification of electromagnetism and gravitation was regarded as a fact. It has been established that gravitation is of the electromagnetic nature whose carrier is the superstrong electromagnetic interaction (SEI).

Gravitation appears in the quantized space-time as a result of its spherical deformation in the formation of the mass of elementary particles.

Correct two-component solutions of the Poisson gravitational equation in the form of a system have been determined for the first time. The functions of distribution of the quantum density of the medium and gravitational potentials inside the particle (solid) in the external region of the spherically deformed quantized space-time have been determined.

It is shown that these spherical functions remain invariant in the entire range of speeds, including the speed of light, and formulate principle of spherical invariance and relative-absolute dualism.

The principal relativity is the fundamental property of the quantized space-time. Gravity is caused by the gradient of the quantum density of the medium and by its deformation vector with the gravity and inertia acting in the direction of this vector.

The force of inertia is also caused by the gradient of the quantum density of the medium and works in the direction of the deformation vector. The gravitational field is quantized in its principle. The space-time quantum (quanton), as a carrier of the gravitational field, is used as a basis for developing the quantum theory of gravitation.

The discovery of the quanton has returned the deterministic base to the quantum theory which was supported by Einstein. The classic wave equation of the elementary particle determining the wave transfer of mass in the superhard and the superelastic quantized medium was analytically derived for the first time.

The wave transfer of mass determines the effect of the principle of corpuscular-wave dualism in which the particle shows both the properties of the wave and the corpuscle.

It has been established that the free gravitational wave with the speed of light and longitudinal oscillations of the quantized medium, generating the longitudinal the zones of compression and tension in the quantized medium, can exist in the quantized space-time.

The nature of gravitation, which explains the accelerated recession of the galaxies of our universe, has been determined.

4. The quantized structure of the electron and the positron. The neutrino
Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 262-351 pages.

The quantized structure of the electron and the positron has been investigated in the development of the Superunification theory. These particles are open quantum mechanical systems and are the compound part of the quantized space-time. The electron (positron) as an elementary particle forms as a result of

attraction of the quantons to the central electrical charge placed in the quantized medium. As a result of the spherical deformation of the medium, the electrical charge acquires the mass and transforms into the electron (positron). It has been established that the main factor which ensures spherical deformation of the medium by the electron is its spherical magnetic field, an analogue of the spin. In annihilation of the electron and the positron the spherical magnetic field is disrupted and the energy of the spherical deformation of the medium, i.e., the energy of the mass defect, is released and transforms into radiation gamma quanta. The released massless charges merge into an electrical dipole, forming the electron neutrino, an information bit indicating that the pair of the particles electron and positron did exist. It has also been found that the movement of the electron (positron) in the superelastic and superhard quantized medium is determined by the wave transfer of mass and tunnelling of the point electrical charge in the channels between the quantons of the medium.

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4 .19. Conclusions

1. New fundamental discoveries of the space-time quantum (quanton) and superstrong electromagnetic interaction enable us to investigate the quantized structure of the electron and the positron as an open quantum mechanical system, being the compound part of the quantized space-time. The electron and the positron as elementary particles are in fact not so elementary and their composition includes a large number of quantons which together with the central electrical charge form the particle inside the quantized medium.

2. It has been established that the mass of the electron (positron) forms as a result of attraction of the quantons to the central electrical charge under the effect

of ponderomotive forces of the nonuniform radial electrical field of the central charge. At the same time, a spherical magnetic field, a spin analogue, forms around the central charge. In particular, the spherical magnetic field of the electron (positron) is the main factor which ensures spherical deformation of the quantized medium leading to the formation of the mass of the particle. In contrast to the nuclons, the electron (positron) does not have any distinctive gravitational boundary in the quantized medium. The conventional gravitational boundary of the electron (positron) is represented by its classic radius, producing a 'jump' in the quantum density of the medium.

3. The gravitational diagram of the electron (positron) has been analyzed. Several characteristic energy zones were found in the electron (positron):
• the zone of gravitational attraction (gravitational well);
• the zone of gravitational repulsion (gravitational hillock);
• the zone of hidden mass and energy

The effect of the zone of gravitational repulsion is evident at the distances smaller than the classic electron radius (of the order of 10^{-15} m. This explains the capacity of the electron to move away from the proton nucleus of the atom, with the exception of the electron capture regime. This also explains the change of the nuclear attraction forces to the repulsion forces when the alternating shells of the nucleons come together to distances smaller than the effect of the nuclear forces 10^{-15} m.

4. The balance of the energy and electron mass (positron) in the entire range of speeds in the quantized medium, including the speed of light, have been determined. The electron energy is manifested as a difference between its limiting and hidden energies. The electron mass is a difference between its limiting and hidden masses. With the increase of the electron speed, the hidden energy and mass of the electron change to the observed forms.

5. The tensioning of the quantized medium around the electron has been investigated. The maximum tension force reaches the value 29 N on the surface of the gravitational boundary of the electron, and the tension is estimated at $0.29 \cdot 10^{30}$ N/m^2 for the electron in the rest state and increases with the increase of the speed in proportion to the normalized relativistic factor. As a result of the colossal tension of the medium, the electron retains its spherical shape. At the same time, the spherical gravitational field is retained in the entire speed range, including the speed of light, with the principle of spherical invariance valid in this case.

6. In addition to the well-known dynamics equation in the electron, it has been shown that the physical nature of the phenomenon is explained most accurately by the dynamics equation with the variation of the mass and energy of the electron along the acceleration path. Continuous acceleration of the electron is accompanied by the redistribution of the quantum density of the medium inside its gravitational boundary, generating the force of resistance to movement. This is a non-inertial movement regime. In transition to the regime of movement by inertia (inertial regime), the electron releases the internal stress determined by the redistribution of the quantum density of the medium during acceleration. Repeated

acceleration of the electron is accompanied by bifurcation of the energy in which the electron appears to count its motion anew, determining the fundamentality of the relativity principle as a unique property of the quantized space-time.

7. It has been established that the movement of the electron (positron) in the superelastic and superhard quantized medium is determined by the wave transfer of mass and by tunnelling of the point charge in the channels between the quantons of the medium. Annihilation of the electron and the positron is accompanied by the disruption of the spherical magnetic field and the released energy of spherical deformation of the medium, as a mass defect, transforms to radiation gamma quanta. The released mass free charges merge into an electrical dipole, forming an electronic neutrino, which is information bit relating to the existence of a pair of particles: electron and positron. The laws of conservation in annihilation of the electron and the positron are valid only in this case.

5. Quantized structure of nucleons. The nature of nuclear forces

Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 745 pages.

In 1966, the structure of nucleons with the sign-changing shell with integer charges – quarks was proposed in the theory of the elastic quantized medium (EQM). This concept proved to be fruitful for the Superunification theory and enabled the nature of nuclear forces to be investigated as contact forces acting between the sign-changing shells of the nucleons. These forces act over short distances and their magnitude and nature correspond to the nuclear forces, but they are characterized by electrical attraction of shells and their antigravitational repulsion.

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5.16. Conclusions

The nature of the nuclear forces is one of the most important problems of theoretical physics. It has been assumed that the nuclear forces are the maximum possible forces in nature, characterizing the strong fundamental interaction, as one of the four forces known in nature. Attempts to unify the strong interaction with other: electromagnetism and gravitation, have not been successful. It has been shown that this is caused by the fact that on the whole the strong interaction is not a carrier of the maximum possible force and cannot be therefore used as a unifying factor. In order to unify the nuclear forces with gravitation and electromagnetism, and also electroweak interactions, we must have an even greater force, previously not known in science. This is the golden rule of physics that the force can be conquered only by a greater force.

The presence of such a Superforce, as the fifth force, became known after discovery of the quantum of space-time (quanton) and superstrong electromagnetic interaction. In particular, SEI (and not the strong interaction) is the carrier of the Superforce. For comparison: the attraction force of the nucleons, characterizing the nuclear forces, is estimated at approximately 0.63 kN (Table 5.1), and the force of interaction between the quantons is of the order of 10^{23} N. The diameter of the nucleon is $\sim 10^{-15}$ m, the diameter of the quanton $\sim 10^{-25}$ m. Even if we not relate the forces to their crossection, these forces are simply incommensurable. As we penetrate deeper into matter, we face higher and higher concentrations of forces and energy. It becomes clear that the only source of energy in the universe is the superstrong electromagnetic interaction. This is electromagnetic energy. All the known types of energy (chemical, nuclear, electromagnetic, gravitation, etc) are regarded in the final analysis as the manifestation of the superstrong interaction and are represent only method of extracting the energy of this interaction. We live in the electromagnetic universe.

The nuclear forces, acting between the nucleons and the atomic nucleus, must be examined from the unified positions of unification of the fundamental interactions through the superstrong electromagnetic interaction. Here, it must be understood that the mass of the nucleons forms as a result of the spherical deformation of the quantized space-time which is a carrier of the superstrong electromagnetic interaction. It has been established that the only possible method of spherically deforming the elastic quantized medium, ensuring that all the possible properties of the nucleons are utilized, is the presence in the nucleon of the shell assembled from electrical massless charges with sign-changing signs.

This shell is sign-changing and has the property of contracting on the sphere with the effect of forces of electrical attraction between the charges of the nucleon shell. The spherical compression of the sign-changing shell takes place together with the medium inside the shell. However, on the external side of the shell, the elastic quantized medium is subjected to tension. In this case, the quantum density of the medium (quanton concentration) inside the shell increases and outside the shell it decreases. Consequently, the nucleon assumes a mass as the parameter of 'distortion' of the quantized space-time under the effect of spherical deformation.

The resistance of the shell to collapse is limited by the pressure of the medium inside the shell which is balanced by the tension of the elastic quantized medium from the external side. In addition, the factor of stability of the nucleons in relation to the collapse of the shell includes the zones of anti-gravitational repulsion between the nuclei of the sign-changing shell whose effect starts to be evident at distances shorter than the classic electron radius of the electron.

Another fundamental property of the sign-changing shells of the nucleons is their capacity to be attracted by the charges with opposite polarity, regardless of the presence or absence of a non-compensated electrical charge. In the proton, the shell contains a non-compensated electrical charge with positive polarity and an odd number of charges – 69 charges. In the neutron, the number of charges in the sign-changing shell is even (70 charges) and these charges are compensated in pairs, so that the neutron is regarded as an electrically neutral particle.

The electrical neutrality of the neutron is evident at distances greater than 10^{-15} m. At shorter distances, not only in the neutron but also in the proton, the electrical field of the sign-changing shell of the nucleons is characterized by specific features of action at short distances of $10^{-16}...10^{-15}$ m, comparable with the spacing of the distribution of the charges in the shell. These are short-range fields and forces which enable the forces of electrostatic attraction of the shells to overcome the forces of electrostatic repulsion of the non-compensated charge of the protons in the atomic nucleus. The open zones of anti-gravitational repulsion in the complicated relief of the fields of the nucleon shells prevent the nucleons from coming together closer than 10^{-16} m, thus avoiding the collapse of the nucleons and ensuring stability of the nuclei.

In particular, the sign-changing structure of the nucleon shells, including the zones of electrostatic attraction and anti-gravitational repulsion, has made it possible to formulate a concept of the electrical nature of nuclear forces within the framework of the Superunification theory.

6. Two-rotor structure of the photon. Photon gyroscopic effect
Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification.
Cambridge International Science Publishing, 2010, 421-511 pages.

After introducing in 1905 the radiation quantum referred to subsequently as the photon, Einstein is justifiably is regarded as one of the founders of quantum theory. However, Einstein could not accept the statistical nature of the wave function which is the basis of the calculation apparatus of modern quantum (wave) mechanics and in his final months assumed that the quantum theory should be deterministic. Only after discovery in 1996 of the space-time quantum (quanton) was it possible to develop a deterministic quantum theory. The classic analysis of the structure of the main elementary particle could be carried out, including the photon, and bypassing the wave function. It was found that the photon is a two-rotor relativistic particle and that its electrical and magnetic rotors exist simultaneously and are situated in the orthogonal polarization planes. The intersection of the polarization planes forms the main axis of the photon around

which the polarization waves can rotate. The main axis of the photon is directed in the direction of the speed vector of the movement of the photon in the quantized medium. In this form, the photon represents a wave– particle, some concentrated bunch of the electromagnetic energy of the quantized space-time, flying with the wave speed of light. The electromagnetic field of the photon satisfies the two-rotor Maxwell equation. Calculation parameters of the photon were determined for the first time: the strength of the electrical and magnetic fields in the rotors of the photon, the densities of the electrical and magnetic displacement currents, the currents themselves, and many other parameters which could not previously be calculated. It was found that deceleration of light in an optical medium is caused by the wave trajectory of the photon as a result of the probable capture by the photon of atomic centres of the lattice of the optical medium with the speed vector of the photon in the quantized medium not coinciding with the speed vector in the optical medium.

Conclusions

1. The new fundamental discoveries of the space-time quantum (quanton) and of the superstrong electromagnetic interaction (SEI) open a new era in the quantum theory, establishing the deterministic nature of the quantum mechanics and electrodynamics. Most importantly, the new fundamental discoveries explain the reasons for quantum phenomena hidden in the quantum nature of space-time. It may be confirmed that there are no non-quantized objects in the nature. The quantized objects include the radiation quantum (photon). Previously, it was assumed that energy quantization takes place by means of radiation quantum. Now we have established the quantization of the very radiation quantum by the quantons (space-time quanta) where the radiation quantum (photon) represents a secondary wave formation in the quantized space-time.

z2. The new fundamental discoveries have made it possible to apply the classic concept in the quantum theory and, at the same time, describe for the first time the nature and structure of the photon whose parameters can be calculated, bypassing the static wave function. It has been established that the photon is a two-rotor

relativistic particle whose electrical and magnetic rotors exist simultaneously and are located in the orthogonal polarization planes. The intersection of the polarization planes forms the main axis of the photon around which polarization planes can rotate. The main axis of the photon is directed along the vector of the speed of movement of the photon in the quantized medium. In this form, the photon is a wave-particle, some concentrated bunch of electromagnetic energy of the quantized space-time, travelling at the speed of light.

3. The variable electromagnetic field of the photon satisfies the two-rotor Maxwell equation and the classic wave equation. The calculation parameters of the photon were determined for the first time: the strength of the electrical and magnetic fields in the photon rotors, the density of the electrical and magnetic bias currents, the currents themselves, and many other parameters which could not previously be calculated.

4. It has been established that the deceleration of light in the optical medium is determined by the wave trajectory of the photon as a result of the probability capture by the photon of the atomic centres of the lattice of the optical medium when the vector of the photon speed in the quantized medium does not coincide with the vector of speed in the optical medium. In fact, two waves propagate in the optical medium and these waves are permanently connected together: a) the electromagnetic wave which travels with the speed of light C_0 in the quantized medium and is transferred by the light-bearing medium; b) the geometrical wave which propagates in the optical medium with phase speed Cp_0 lower than the speed of light C_0, which is synchronized with the electromagnetic wave and determines the wave trajectory of the photon in the optical medium.

5. It has been shown that the wave trajectory of the photon in the optical medium can be represented by the first harmonics of the triangular periodic function. The condition of movement of the photon along the wave trajectory is the constancy of the speed of light in the quantized medium. In this case, the imaginary motion along a straight line in the optical medium in the same period of time as in the case of the wave trajectory is regarded as the deceleration of light in the optical medium. The calculations show that the refractive index of the light by the optical medium can be regarded as the averaged parameter of the medium in movement of the photon along the wavy trajectory.

7. Nature of non-radiation and radiation of the orbital electron
Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification.
Cambridge International Science Publishing, 2010, 512-581 pages.

In this book, the reasons for the non-radiation radiation of the orbital electron in the composition of the atom are examined for the first time using the classic approach. It is established that the atom is an energy-balanced system capable of stabilizing the mass of the orbital electron in the entire speed range, including relativistic speed. The radiation of the orbital electron takes place in the range of relativistic speeds as a result of the mass defect of the electron in the atom

nucleus and is associated with the effect on the electron of threshold (critical) accelerations, determining the discrete nature of radiation.

7.9. Conclusion

The discovery of the quantized structure of the electron, as the compound part of the quantized space-time in the Superunification theory, shows that its radiation is associated with its mass defect.

It has been shown for the first time that the orbital electron has a complicated orbit, rotating inside the gravitational well of the atomic nucleus. In particular, this factor is stabilizing and ensures the constancy of the electron energy on approach to the nucleus when the increase of the electrical component is fully compensated by the decrease of the gravitational energy of the system as a whole.

Has been shown that the radiation of the orbital electron takes place at speeds close to the speed of light by synchrotron radiation which takes place when the centrifugal critical acceleration is reached. The electron is not capable of maintaining the spherical symmetry of the deformed quantized space-time which forms its mass, and part of the deformation energy, which has been lost, is transferred to the energy of photon emission.

It has been shown that the reason for the probability electron cloud of the orbital electron inside the atom has a fully determined base and is associated with special features of the trajectory of the electron.

8. Thermal photons. Molecule recoil in photon emission

Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification.
Cambridge International Science Publishing, 2010, 583-602 pages.

In the development of quantum thermodynamics in the Superunification theory it was necessary to deal with the paradox contradicting classic approaches. It has been established that atom recoil in photon emission is inversely proportional to photon energy. The strongest recoil is characteristic of thermal low-energy photons. This result is explained by the special feature of the two-rotor structure of the photon – the compound and inseparable part of the quantized space-time. The electrical rotor of the photon induces an electrical field in the quantized space-time which, acting on the charge of the atom nucleus, produces a momentum, ensuring recoil of the atom (molecule) and their oscillations. The atom (molecule) is repulsed from the electrically polarized quantized space-time and not

from the photon. Only in this case can calculations produce the results corresponding to the actual processes and eliminate the existing energy paradox.

9. Gravitational waves. Wave equations

Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 603-650 pages.

The Superunification theory has unified electromagnetism and gravitation through the superstrong electromagnetic interaction. The nature of gravitation and electromagnetism has been determined. If electromagnetism the result of electromagnetic polarization of the quantized space-time, gravitation is caused by its deformation (distortion). Deformation changes the quantum density of the medium (the concentration of quantons in the volume), whereas in electromagnetic polarization the quantum density of the medium remains unchanged. This is the large difference between gravitation and electromagnetism. Electromagnetic waves are transverse polarization oscillations of the quantized medium. From the source of gravitational perturbation, gravity is transferred through the longitudinal deformation of the quantized space-time. Therefore, long-term search for gravitational waves, regarded as transverse waves, was a procedural error. It has been shown that gravitational waves are the longitudinal oscillations of the deformation of the quantized space-time. In August 2006, I generated and sent into the cosmic space a longitudinal gravitational wave with the power of the order of 100 W.

9.15. Gravitational waves in quantized space-time
9.16. Report by V. Leonov on the generation of a gravitational wave
9.17. Conclusions

9.17. Conclusions for chapter 9

The nature of gravitational waves can be determined by the theory of the elastic quantized medium (EQM) (or Superunification theory) which at present is the most powerful analytical apparatus for investigating the matter and most complicated physical phenomena. The EQM theory is the theory of the unified field whose principles were predicted by Einstein within the framework of the general theory of relativity (GTR). It has been established that the quantized space-time is governed by the principle of spherical invariance and the relativity principle is the fundamental property of the quantized space-time. The theory represents a further development of the quantum theory and quantum considerations regarding the nature of matter from the viewpoint of electromagnetism. The discovery of the electromagnetic structure of the quantized space-time has enabled us for the first time to determine the superstrong electromagnetic interaction (SEI), i.e., the fifth force, combining gravitation, electromagnetism, nuclear and weak forces.

On the basis of the analysis of the wave oscillations in the elastic quantized medium (quantized space-time) it can be assumed that Veinik recorded for the first time in experiments the longitudinal gravitational waves in the form of moving zones of compression and of the decrease of the quantum density of the vacuum medium emitted at the moment of a change in the deformation-stress state of matter. The Veinik results were reproduced by other investigators. However, the Veinik experiments are characterized by low stability and a low recorded strength of the signal comparable with the level of noise and interference. It is important to develop completely new methods of generating and receiving gravitational waves.

The scientific fundamentals of these developments are provided by the EQM theory which describes for the first time the structure of the quantized space-time regarding it as an elastic quantized medium, being a carrier of wave perturbations in the quantized space-time. Analysis of the wave perturbation of the quantized space-time shows that there are three types of wave oscillations in it: transverse, longitudinal and torsional. All three types of the wave oscillations of the quantized space-time have been observed in experiments.

Transverse oscillations. This type of oscillations in the quantized space-time is manifested in the form of an electromagnetic wave generated by the transverse electrical and magnetic polarization of the quantized space-time (electrical and magnetic bias currents).

Longitudinal oscillations. These oscillations are manifested in the form of a gravitational wave as longitudinal displacement of the zones of compression and of the decrease of the quantum density of the medium in the quantized space-time.

Torsional oscillations. This complicated, insufficiently examined type of oscillations in the quantized space-time is associated with the formation of torsional oscillations.

Thus, it has been shown for the first time that the gravitational waves are characterized by the longitudinal oscillations of the quantized space-time. Knowledge of the nature of gravitational radiation makes it possible to develop completely new devices for excitation of gravitational waves.

In the area of communications, one can expect the development of completely new and unusual channels for sending and receiving information which differ from the channels based on conventional electromagnetic waves. This expands the range of investigations of matter, including biological systems in medicine and agriculture. Naturally, Veinik's discovery is constantly utilized by astronomers and astrophysicists who have been expecting for a long time the discovery of an effective method of recording gravitational waves.

10. Superstrong electromagnetic interaction and prospects for the development of quantum energetics in the 21st century

Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 651-710 pages.

The new fundamental discoveries of the space-time quantum (quanton) and the superstrong electromagnetic interaction (SEI) have made it possible to establish in the Superunification theory that the only source of energy in the universe is the SEI, and the known types of energy (chemical, nuclear, etc) are only methods of extracting the energy of the SEI. The new discoveries explain the unique experimental effects: the Usherenko, Leonov and other effects, associated with the generation of excess energy in new energy cycles for the open quantum mechanics systems, where the source of energy is the superstrong electromagnetic interaction. Theoretical and experimental fundamentals now exist for the development of quantum reactors, heat generators and quantum engines of a new generation which will form the basis of the quantum energetics in the 21st century. The quantum reactors are the source of thermal energy and in future they can replace nuclear reactors in nuclear power stations, ensuring that nuclear power engineering will be economically capable of competition and ecologically safe. The quantum engines open prospects for the development of power units for a new generation of ground-based and space transport.

10.1. World economy and scientific and technical revolutions
10.2. Scientific errors and new energy concepts
10.3. Dependence of the efficiency of the cycle on the energy yield of fuel
10.4. Quantum thermal energetics. Usherenko effect
10.5. Quantum reactors
10.6. Cavitation heating
10.7. Quantum engines.
10.8. Practical application of quantum engines
10.8.1. New generation automobiles
10.8.2. Spaceships and aircraft
10.8.3. Quantum engines-generators
10.9. Forecast of the development of quantum power engineering in 21st century

10.9.4. Leonov's forecast for 100 years

Now follows the statements by Vladimir Leonov in the interview with the Russian newspaper 'Power engineering and the industry of Russia', 2009, No. 7, April:

– What is your forecast for the development of quantum power engineering for the next, let us say, 100 years?

– I am not a prophet of the Nostradamus type, and if I make the forecast of the development of science and technologies, then I am guided in this case by the fundamentally new knowledge which the theory of Superunification provides. It is natural that the transition to quantum power engineering will not occur immediately and decades will be required before we introduce the new technologies and the branches of management throughout the entire world. Let us define two large directions: quantum reactors (heat generators) and quantum engines. Nuclear reactors also belong in the group of quantum reactors (heat generators).

Quantum engines are the fundamentally new devices, intended for carrying out mechanical work due to the creation of thrust without the ejection of reactive mass. I would like to mention that the level of the technologies at the beginning and the end of the 20th century cannot be compared. To attempt to look 100 years into future is possible relying only on the prospects for the development of quantum power engineering: power engineering will be completely decentralized over hundreds years. Many autonomous quantum energy sources with satisfy all needs for the supply of heat and electrical energy. Evidently, the sphere of sale of heat and electric power will disappear and will be replaced by business dealing with the production of energy sources, their operation and repair and also with the delivery of fuel, for example the sand prepared for cold synthesis reactors utilizing the Usherenko effect and also catalysis preparations for cavitation reactors.

Quantum engines will prevail in the field of transportation. Possibly, the classic automobile on the wheels will disappear (analogous example with the locomotive) and a gravitational 'cushion' will replace them. There will no longer be any need for arterial roads which will benefit Russia with its huge territory. 'The flying saucer' will become the main universal transport means. The Moon will be colonized and inteplanetary flights will become regular.

Read more: Vladimir Leonov, et al. Non-rocket, non-reactive quantum engine: idea, technology, results, prospects. http://viXra.org/abs/1910.0124.