

Key to a door of the Universe

The modern physics has collected many experimental data. They are used for development of numerous theories. The powerful mathematics is applied for this purpose. Physics assign to its big hopes. In their opinion, the mathematics is capable to serve with success to physics as an explanation of the device of the world and a prediction still the unknown phenomena. In it acknowledgement of the validity of the theory sees. The author believes that in a basis of any mathematics there should be a physical model of the phenomena, which is capable to answer the device of our world to the greatest degree. Without it any theory is doomed for impasse in understanding of the universe.

The fact of propagation of electromagnetic waves (EMV) in vacuum of space till now remains a riddle [26] and forms the basis for return to concept of "ether" which existed till XX century. Return should be executed with use of modern knowledge. In 30th years of the last century the positron has been opened. It is a analogue of electron on all parameters also differs from it only in sign of charge. For new understanding of an ether which is now replaced by ridiculous term: "physical vacuum", there are all experimental data. It, first of all transformation of gamma-quantum with energy 1,022 MeV in to a pair electron and a positron. We shall name environment in which light and in which the pair of electron-positron as **zero-substance**. It is easier to name a former ether as **zero-substance (ZS)**. The electromagnetic wave (light) can be propagated **only** in the physical environment which structure limits speed of propagation of light. Vector **E** and **B** in an electromagnetic wave can be functionally connected through charges (+) and (-), capable to create currents of Maxwell displacement.

The most general parameters of structure of **ZS** are as a first approximation determined from the energy equation:

$$h\nu = e_o E \Delta r_e. \quad (1)$$

Here **h** - Planck's constant, ν - frequency of gamma-quantum, e_o - an elementary charge, **E** - intensity of an electric field of **ZS**, Δr_e - deformation of **ZS** under influence of gamma-quantum.

Let's determine intensity of an electric field, where N - unknown factor:

$$E = N \xi \frac{e_o}{r_e^2}. \quad (2)$$

At passage of a wave of gamma - quantum deformation of **ZS** which is a part of the specified distance is formed, depends on cyclic frequency of a wave $\omega = 2\pi\nu$ and time t_v of passage of distance between charges:

$$\Delta r_e = 2\pi\nu r_e t_v. \quad (3)$$

Let's substitute the received expressions, amplitude from (3) and intensity from (2) in (1):

$$h = 2\pi N e_o^2 \xi \frac{1}{r_e / t_v}. \quad (4)$$

It is possible to assume that $r_e / t_v = c = \sqrt{\eta \xi}$ - speed of light. We shall determine the number of N :

$$N = \frac{h}{2\pi e_o^2 \sqrt{\xi / \eta}} = 137.035999815 = \alpha^{-1}, \quad (5)$$

where $\eta = \frac{1}{\mu} = 1,000000000 \cdot 10^7 [a^2 \cdot M^{-1} \cdot \kappa^2 \cdot c^2]$ - Magnetic constant of **ZS**

$\xi = \frac{1}{\varepsilon} = 8,98755179 \cdot 10^9 [a^{-2} \cdot M^3 \cdot \kappa^2 \cdot c^{-4}]$ - Electric constant of **ZS**. The unknown number appeared as return size of a constant of thin structure. The equation of energy of a photon for «Red border» $h\nu_{rb}$ and electric energy of pair electron and a positron:

$$w = \xi \frac{e_o^2}{r_e} = 2\pi\alpha^{-1}e_o^2\nu_{rb}\sqrt{\xi/\eta} = 1.64936940 \cdot 10^{-13} J. \quad (7)$$

Frequency of gamma - quantum for «red border» $\nu_{rb} = 2.489213 \cdot 10^{20}$ Hz. Electric intensity of **ZS** $E = 1.008552 \cdot 10^{23}$ V/m. From (7) we find the size of a structural element of **ZS**, from (1, 2) limited deformation of **ZS**:

$$r_e = \frac{c}{2\pi\alpha^{-1}\nu_{rb}} = 1.3987631 \cdot 10^{-15} m$$

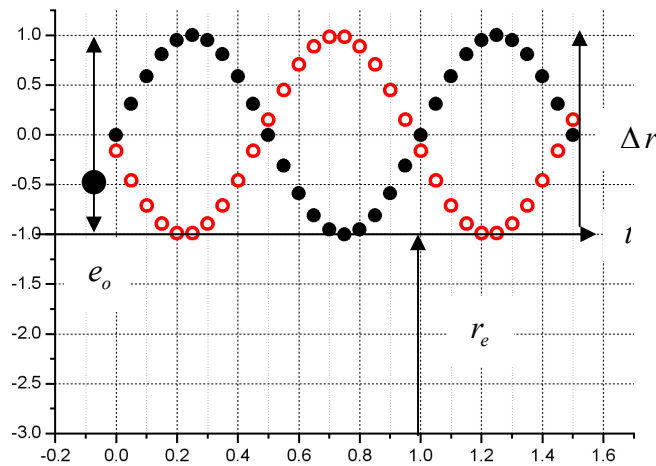
$$\Delta r_{rb} = \frac{h\nu_{rb}r_e^2\alpha}{e_o^2\xi} = 1.020726744 \cdot 10^{-17} m. \quad (8)$$

Applications of the received structure of the ZS to a number of the physical phenomena

I. Propagation of EMV (light) into ZS

On the scheme of fig.1 the approximate mechanism of excitation and propagation of light in structure of **ZS** is shown. Black circles designate charges (–), light circles designate charges (+). The amplitude of fluctuations of the connected charges of structure is much less than distance between units of charges and in a limit with amplitude of $\alpha^{-1}r_e = 1.020726744 \cdot 10^{-17}$ meter creates the conditions for transformation of energy of gamma – quantum into a pair of a electron–positron. Movement of charges of a lattice forms a current of displacement j . To movement of charges there corresponds a vector of electric intensity E , the current generates a vector of a magnetic induction B .

If on fig.1 length of a wave is $\lambda = 1.2043666 \cdot 10^{-12}$ meter that corresponds to “red border” of



"photoeffect" then a length of a wave $\frac{\lambda}{2\pi\alpha^{-1}} = 1.398763098 \cdot 10^{-15}$ covers $861.02 = 2\pi\alpha^{-1}$

distances in a lattice of **ZS**.

Intensity of electric field $E=2.343e+20$ V/m in a source from an electron (on the scheme a large black circle) appears quite to be sufficient for creation of displacement of charges (+) and (–) on distance of wavelength. The half wave shifts in one side all charges (+), and in the opposite side - all charges (–). At this displacement of charges the coordinated currents of displacement which connections of vectors **E** and **B** for waves of light are formed. Displacement of structure gets character of deformation like an action of forces of gravitation: for one half wave which is taking place the given place of structure of force of gravitation, are directed to one side, for the following half wave - are directed to the opposite side. In a result external gravitational property of light is shown poorly and can be expressed as a pressure of light or as a pulse of gamma - quantum.

The scheme is very rough. First of all, distances between “black” and “red” charges there should be as $1,39876 \cdot 10^{-15}$ meter on all directions, and displacement in this structure a maximum makes only 1/137 part from this distance. Distances on a vertical between charges are proportional to a current of displacement **j**. Connection between electric and magnetic vectors in an electromagnetic wave follows from formula Maxwell:

$$\Delta \bar{\Phi} + \frac{1}{c^2} \frac{\partial^2 \bar{\Phi}}{\partial t^2} = \frac{1}{\eta} \text{rot} \bar{j} = \frac{1}{\eta} \text{rot} \frac{\partial \bar{E}}{\partial t}, \text{ where } \Phi = B \cdot s, \Delta - \text{Laplace Operator.} \quad (9)$$

It is formally possible to exclude a current of displacement in the equation (9). To that operation there are no mathematical obstacles. But the phenomenon of light propagation will be disturbed. All known phenomena in electromagnetic machines affirm: the electric voltage is connected to a magnetic induction only with the help of currents of conductivity and displacement. Having excluded the relation as $\frac{1}{\eta} \text{rot} j$, we exclude **environment** in form of space in which there is phenomenon EMV (light). It is possible to tell that it is equivalent to ignoring of electric permeability of vacuum $\epsilon_0 = \frac{1}{\eta}$. Speaking by terms of existing physics: the space in which the wave of light should be propagated is eliminated. The full stream of a magnetic induction “**Φ**” is not equal to zero only that case when inside the closed surface “s” there is a magnet - mass continuum of **ZS**.

I. Problem of close – and distant – actions

Development of understanding of the Nature in physics historically passes through fundamental debate between short-range and long-range actions. As a rule, with some exceptions, all theorists recognized only the fantastic long-range action, many experimenters counted necessity of concept short-range which is obliged to have **environment** for transfer of force interactions.

I shall remind supporters of concept short-range: Newton, Faraday, Maxwell, Lorentz and many others. For the concept short-range the physical **environment** is necessary. Newton it is difficult to relate to unconditional supporter’s concept short-range due to the mathematical description of gravitation. But his direct judgement on the given problem is like that:

«I do not present myself that force could be transferred from one to another without means of something other, that is non-material, and it seems to me is inadmissible as the big absurdity.»

Supporters of long-range action are such theorists, as Coulomb, Ampere and Laplace. Essentially long-range actions are obliged to be transferred to a distance instantly. In it there is a weakness of a position of similar transfer of interactions. R. Feynman "has bypassed" this problem in XX century originally: he has entered exchange fields or better still, exchange particles: photons, mesons, W-X-Z particles. Thus, the question to a consensus between theorists and experimenters has been resolved. As photons and other particles cannot instantly be propagated, the question on restriction of speed of propagation of the interactions has been by itself resolved.

A.Einstein occupies the special place in this "competition". He has entered curvature of space as the form of gravitational interaction. On the one hand, the curvature of space set in one mass, overcomes EMPTY space up to other mass. On the other hand, gravitation speaks the EXCHANGE between masses by ability to a space curvature. Long-range action is combined with short-range actions under R.Fejnmana's script. Absence of the real *environment* limiting speed of propagation of gravitation (curvature of space) has demanded introduction of a postulate of restriction to any interactions by speed limit of light. We shall notice that postulates in physics are fraught with an assumption of a mistake of basic character. Postulates (axioms) are necessary in mathematics, in geometry. Without axioms in these sections of a science it is impossible to apply logic of a conclusion of theorems, consequences and to that of the similar judgements filling these disciplines by the contents. In this connection it is possible to assert essential difference of mathematical disciplines from a subject of physics. Ignoring of this difference can lead to cardinal errors in knowledge of the nature of the Universe. It seems to us, that the decision on forces of interaction in physics without taking into account an opportunity of existence special *environments* borders to frank mysticism.

III. Gravitation and inertia

The **ZS** having electromagnetic structure, can be a source of gravitation and inertia. It is enough to assume, that ZS has surplus of a charge with is sign (+) or (–). The charged *environment* with the help of Faraday induction is capable to polarize any material bodies and to attract the polarized bodies to each other. That it, probably, is proved by an attraction by the electrified subject of not charged objects. It is possible to assume also, that the charge of ZS is formed by infringement of symmetry in quantities (amounts) of an electricity of charges (+) and (–). Probably, the difference of sizes of charges is determined from equality of forces of Newton and Coulomb at equal distances for electron mass:

$$\sqrt{\xi} \Delta e^{\pm} = \sqrt{G} m_e^{\pm}; \quad \Delta e^{\pm} = \sqrt{\frac{G}{\xi}} m_e^{\pm} = 7.8490194 \cdot 10^{-41} \text{ Coulomb.} \quad (10)$$

At lack of material objects at the Universe, Coulomb forces of the charged **ZS** create "negative pressure", responsible for expansion of the Universe. These forces can apply for the "dark" energy discovered with the help of a telescope "Hubbell" in 1998. The attention pays to itself that the relation of forces of gravitation is less than forces of electricity approximately in 10^{42} times. It can be determined precisely, substituting in the equation of a charge (10) of electron. About the same estimation exists in physics.

The difference in charges (+) and (–) is in 21 sign of electron charge.

The charge of structure possesses polarization. The common representation about the law of Newton in terms of polarization is given with the following reasoning. From the formula (10) we receive connection of mass with a charge $\rho = \sqrt{\frac{G}{\xi}} = 8.6164161 \cdot 10^{-11} \text{ Coulomb/kg}$.

Spherical polarization from a charge q is defined by parity: $\sigma_R = \frac{q}{4\pi R^2}$. The equivalent of a charge of mass M pays off as a charge $q = \rho M$. Dependence of acceleration on forces of gravitation: $g = G \frac{M}{R^2} = 4\pi \sqrt{G\xi} \sigma_R$. Formally all these true and should not cause objections.

Except for the main thing: whether there it corresponds to analogy of masses and electric charges in a reality? The formula of gravitation of Newton gets a view:

$$F = G \frac{M_1 M_2}{R^2} = \xi (4\pi R)^2 \sigma_{12} \sigma_{21} \quad (11)$$

Polarization σ_{12} is created by the first mass in a point of the second mass, and polarization σ_{21} is created by the second mass in a point of the first. Product of polarization's can be named as mutual polarization.

It is necessary to note, that there is a "independent" formula for a presence of value:

$$\rho = e_o \sqrt{\frac{2\pi G}{c \alpha h}} = 8.6164161 \cdot 10^{-11} \text{ Coulomb /kg}. \quad (12)$$

Despite of external visibility of "independence" of this formula, definitely there is a connection between formula (10) and (12). This connection is traced at application of the formula (10) to a charge of electron: $e_o = \sqrt{\frac{G}{\xi}} m_x = \sqrt{\alpha} m_{Pl} = \sqrt{\frac{c \alpha h}{2\pi G}}$; $\rho = e_o \sqrt{\frac{2\pi G}{c \alpha h}}$. Here

Planck's mass and its definition $m_{Pl} = \sqrt{\frac{c h}{2\pi G}}$. In connection with similar concurrence, such law of the nature is offered:

" The nature is uniform in all displays. This unity proves to be true full interrelation of all global constants among themselves "

In scientific - household language it refers to as a tautology. The author of a tautology is the Nature. All tautology is made in Euclidean space that is responsible for π number. Connection between ZS permeability, constant gravitation, a charge of electron, speed of light and thin structure constant is unique on character of connection of gravitation, electromagnetism, and radiation.

Now we will address to polarization of structure **of ZS**.

Polarization of an individual elementary charge:

$$\sigma_e^\pm = \frac{e_o^\pm}{4\pi r_e^2} = \pm 6.5164951214 \cdot 10^9 \text{ Coulomb /m}^2. \text{ Naturally direct polarization of structure is}$$

almost in the compensated condition of balance of polarization from charges (+) and (-). Not compensated part of polarization should be as the result of inequality of charges (+) and (-):

$$\sigma_\Delta^\pm = \frac{\Delta e^\pm}{4\pi r_e^2} = \pm 3.192414684 \cdot 10^{-12} \text{ Coulomb /m}^2. \text{ This polarization should cause gravitation}$$

and inertia. However, any interaction should be shown through deformation of **ZS** that finds the expression through change of the value of elements of structure:

$$\sigma_{\Delta r} = \frac{e_o}{4\pi\alpha^2 r_e^4} (\Delta r)^2 = S (\Delta r)^2. \quad (13)$$

The factor before a square of deformation is constant and it can be calculated $S = \frac{e_o}{4\pi\alpha^2 r_e^4} = \mathbf{6.25456357 \cdot 10^{43} \text{ Coulomb/m}^4}$. The outcome of the formula (13) can be

executed the next way. Real electron creates polarization $\sigma_{Re} = \frac{e_o}{4\pi R_e^2} = \mathbf{1.605598 \cdot 10^9 \text{ Coulomb/m}^4}$. R_e is the classical radius of electron. Polarization from electron at distance of the first stationary orbit of atom of hydrogen will be $\sigma_{Bor} = \frac{e_o}{4\pi R_{Bor}^2} = \mathbf{4.553005 \text{ Coulomb/m}^4}$.

The relation of polarization's is given by the formula $\frac{\sigma_{Re}}{\sigma_{Bor}} = \left(\frac{R_{Bor}}{R_e} \right)^2 = \mathbf{3.52645828400 \cdot 10^8} = \alpha^{-4} = \text{const}$.

We assume, that the relation of polarization's, equal constant of the thin structure in the fourth degree there is the general rule satisfying quantum structure of **ZS**. Besides, from the equation of energy follows that $w = \xi \frac{e_o^2}{R_e} = \xi \frac{e_o^2}{r_e^2} \alpha^{-1} \Delta r$; $\Delta r_e = \alpha \frac{r_e^2}{R_e} = \mathbf{5.0666388704520 \cdot 10^{-18}}$.

Similarly we determine deformation of structure of ZS on distance of radius of the Bohr atom $\Delta r_{Bor} = \alpha \frac{r_e^2}{R_{Bor}} = \mathbf{2.698053608229 \cdot 10^{-22} m}$. The relation of the specified deformations

$\frac{\Delta r_e}{\Delta r_{Bor}} = \alpha^{-2}$. We receive polarization of ZS through a constant $\sigma_x = \alpha^4 \sigma_e$. In a result we come to the formula (13).

All parities testify for the benefit of quantum understanding of structure of **ZS.**

Acceleration from any forces, including gravitational forces, generates deformation of **ZS**. Dependence of acceleration and value of deformation is given by the formula:

$$g = 4\pi E_\sigma S (\Delta r)^2; \quad E_\sigma = \sqrt{G\xi} = \mathbf{0.774404859 \text{ [m}^3 \text{ a}^{-1} \text{ s}^{-3}]}. \quad (14)$$

Inertia is force resistance of **ZS** to any change of speed of movement of material bodies:

$$f = ma = m \cdot 4\pi E_\sigma S (\Delta r)^2.$$

One of the central problems in physics still has an unresolved question about speed of propagation of gravity or gravitational waves [15, 25]. It is possible to assume that from the point of view of mutual coherence of all objects of the universe speed of gravitation should exceed speed of light on much more orders. On the basis of structure of **ZS** and its properties we shall try to make "estimation" of this speed. Longitudinal elasticity of ZS defines force (14) $f = b_g (\Delta r_{rb})^2$; $b_g = 4\pi E_\sigma S \cdot m_e [\text{kg} \cdot \text{m}^{-1} \text{ s}^{-2}]$. Here as mass the mass of electron or positron which are born from volume around of a charge (–) or (+) is accepted.

Therefore we receive density of the ZS as $p = m_e \frac{3}{4\pi(r_e + \Delta r_{rb})^3} = \mathbf{7.7749501 \cdot 10^{13} \text{ kg / m}^3}$.

Speed of longitudinal waves of gravitation is determined also, as well as in usual material environments: $c_g = \sqrt{\frac{b_g}{p}} = \mathbf{2.7979296 \cdot 10^{15} \text{ m/s}}$. At least, speed of gravitational waves or transfer of gravitation from a body to a body more than on 6 orders is higher than speed of

light. We shall check up a probable ratio of speeds of gravitation and light as $\beta = \frac{c_g}{c} = \pi(4\pi\alpha^{-1})^2 = 9.31620306 \cdot 10^6$. The ratio looks reasonable as it is defined not by random variables, and well-known constants. At such speed hardly more distance than $10^{26} m$ (the accepted size of our universe) gravity will pass for *1000 years*. It is quite possible, that speed of gravitation appears in π times less and then the ratio of speeds will be more logical

$$\beta_{\pi} = \frac{c_g}{\pi c} = (4\pi\alpha^{-1})^2 = 2.96544 \cdot 10^6.$$

IV. Dependence of speed of light in space from physical "fields"

Propagation of light to the **ZS** is provided by transverse deformation of structure. Deformation results to occurrence of currents of displacement. Currents of displacement serve as functional connection between a stream of a magnetic induction and electric intensity (9.) similarly usual acceleration and gravitational acceleration also concerns to longitudinal deformation of structure (14). **ZS** appears uniform for completely different natural phenomena. In it the doubtless *unity* of the Nature is shown. Relying on this property, it is logical to make search of the general influence on ZS from the known physical "fields". The concept of a field undertakes in inverted commas for the reason that now the term "field" is understood as a certain essence that is postulated property of materiality without any experimental proof. Actually there are no fields without their material source (mass, electric charges and their currents). The principle of force short-range action dictates conditions as existence of **ZS** for transfer of "fields".

We believe, that speed of light can depend on deformation of **ZS** under the formula:

$$c_{\sim} = c \sqrt{1 - \left(\frac{\Delta r_{\sim}}{\alpha r_e} \right)^2} \quad (15)$$

The resulted dependence while only is postulated and does not follow from any theoretical researches. But should be confirmed experimentally. For its conformation, exist a number of substantiation's:

1. The found out "black" holes in space.
2. The phenomenon of red displacement at radiation by heavy stars.
3. A deviation of light by the Sun.

"Black" holes are invisible for the reason that on their border deformation of **ZS** reaches the limit, and light loses ability to propagate. Formally it means equality to zero the speed of light. Reduction of speed of light near to heavy stars results as in a deviation of the rays of light which are passing by, and to displacement of a spectrum of radiation of light from a star in a free space in which speed is more, than on a surface of radiating object. Substitution in (15) deformations of **ZS** from (14) gives:

$$c_{\sim} = c \sqrt{1 - \frac{1}{(\alpha r_e)^2} \frac{g}{4\pi E_{\sigma} S}} \quad (16)$$

The formula can be checked up by the example of a deviation of light by the Sun. We shall take advantage of Huygens principle that has defined factor of refraction of light as the relation of speeds:

$$n = \frac{\sin(90^\circ)}{\sin(i)} = \frac{1}{\sin(i)} = \frac{c}{c_i}. \text{ The beam by a surface of the Sun forms with a normal to a surface}$$

a corner 90° , and the rejected beam passes under a corner i to a tangent for a surface. So the factor of Huygens refraction [1] is determined. We receive the formula for a corner of a

deviation: $i = \arcsin\left(\sqrt{1 - \frac{1}{(\alpha r_e)^2} \frac{g}{4\pi E_\sigma S}}\right)$. However, directly to use the given formula it is impossible. In the formula it is meant, that acceleration from gravity is imposed on all **environment**. There is no also an indication, for what size of object the given acceleration is necessary. Correction is found by empirical way, and it consists in $\left(\frac{1}{\pi\alpha^{-1}}\right)^2$. The size in a denominator already met above and it is not casual. It also is used in Compton length of electron. We shall enter radius of object R_o . The formula of calculation of a deviation of light by the Sun will be:

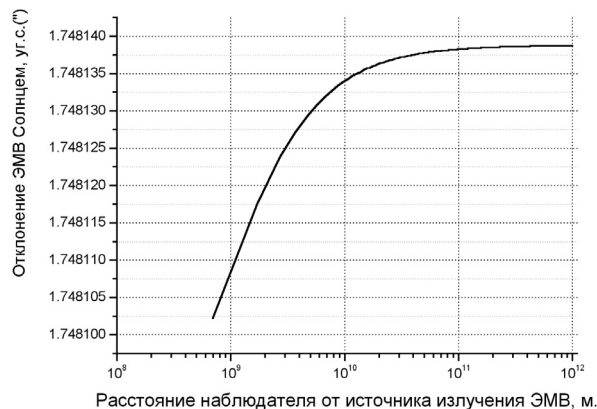
$$i = \left(\frac{1}{\pi\alpha^{-1}} \frac{g}{g_{sun}}\right)^2 \cdot \arcsin\left(\sqrt{1 - \frac{1}{(\alpha r_e)^2} \frac{GM}{4\pi E_\sigma S R_o^2}}\right) \cdot 2,062648 \cdot 10^5 \text{ angular seconds.} \quad (17)$$

The relation is entered into a multiplier acceleration from forces of gravity for an opportunity to use the formula not only for the Sun, but also for other objects. To the table we shall bring in the data received from (17) and designed under formula GR: $i_{GR} = 4GM / c^2 R_o$.

Space object	Acceleration of a gravity, m/s ²	Corner of a deviation, angle sec.	The data of GR
Sun	271	1.74803	1.744277
Jupiter	25,1	0.01478	0.016437
Earth	9,81	0.00225	0.000574
Moon	1,62	0.00006	0.000026

The corner of a deviation by the Sun coincides with the data of measurements [13], and differ from the data of the GR. For the Jupiter difference also is insignificant. The data for the Earth and the Moon are not can be checked owing to accuracy of measurements.

On the fig.2. dependence of a deviation of a beam of an electromagnetic wave on distance the

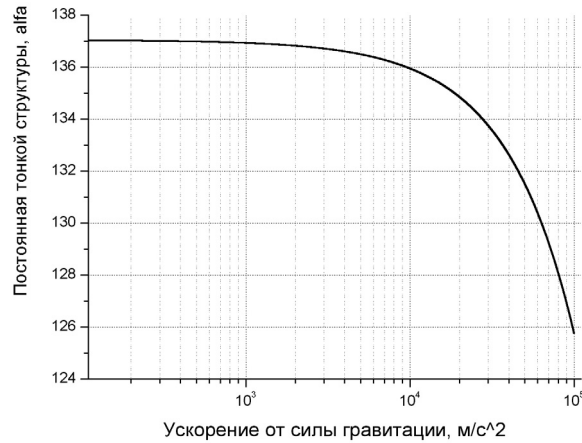


source - observer is resulted. It is visible, that with growth of distance the corner of a deviation varies poorly and the changes are shown for the Sun only in 4 and 5 digits of value. The basic deviation occurs directly at a surface of the Sun. The constant of thin structure pays

off under formulas: $\alpha^{-1} = \frac{hc}{2\pi\xi e_o^2} = \frac{h}{2\pi e_o^2} \sqrt{\frac{\eta}{\xi}} = 137.03599979$. If speed of light depends

on deformation of ZS and **alfa** depends on a condition of ZS:

$$\alpha^{-1} = \frac{h}{2\pi\xi e_o^2 c_o} \sqrt{1 - \frac{1}{(\alpha_o r_e)^2} \frac{g}{4\pi E_\sigma S}}. \quad (18)$$



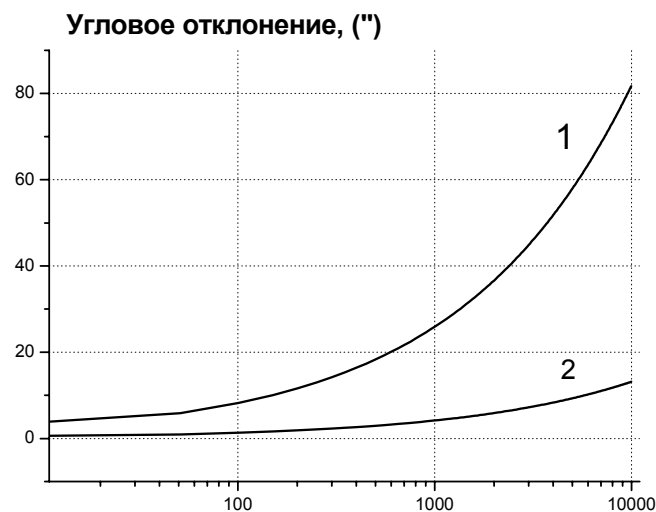
The settlement schedule is resulted on fig.3. There is dependence of **alfa** on gravitational acceleration or any other acceleration.

It appears, that **alfa** is not a constant for all Universe. it is determined by a ratio permeability and decreases depending on a deformation condition of **ZS**. It means, that all electromagnetic phenomena should change. Changes concern both to radiation, and to electromagnetic forces. They decrease with increase of deformation of ZS. For the limiting gravitational acceleration determined according to the formula (14) $g_{\max} = 4\pi E_\sigma S (\Delta r_{rb})^2 = 6.341445 \cdot 10^{10} \text{ m/s}^2$, the constant of thin structure becomes equal to zero. It means, that all electromagnetic phenomena on border of "black" holes are impossible.

V. Influence of physical "fields" on speed of light in *the ZS*

Magnetic "field" also influences structure of vacuum and changes speed of light. Calculation of influence of a magnetic field on speed of light is made under the formula similar (16):

$$c_B = c_o \sqrt{1 - \left(\frac{\alpha^{-1}}{r_e}\right)^2 \frac{\sqrt{G\eta} B}{4\pi E_\sigma S}}, \text{ где} \quad (19)$$



1-ускорение "g" ; 2-магнитная индукция B, Тесла
and gravitation.

B is a magnetic induction of magnetic "field".

On diagram of fig.4 dependencies of a deviation of rays of light are resulted at passage of gravitational and magnetic "prisms". Scales for acceleration and a magnetic induction coincide. Diagram 1 concerns to a deviation of rays of light gravitation. Bottom diagram 2 concerns to a deviation of rays of light magnetic "field". Calculations for an electric field have shown that its influence on structure is much less than influence of magnetism

It is the surprising fact that contradicts a ratio of gravitational, magnetic and electric forces. They here are located on increase of interaction forces.

VI. Properties of black holes

That area of ZS in which its deformation has reached the limit (8) forms the border of a black hole. The limit is reached with the least expenses of energy acceleration. The maximal acceleration $g_{\max} = 4\pi E_{\sigma} S (\Delta r_{rb})^2 = 6.341445 \cdot 10^{10} \text{ m/s}^2$. Speed of light at such deformation or at such acceleration is equal to zero. The black hole becomes invisible, and its border possesses the greatest possible big gravitational attraction. Conditions for a birth of substance and antistubstance are created at corresponding energy of gamma - quantum. At the elementary case electrons and positrons are born. This phenomenon is named in physics "evaporation" of black holes (S.Houking). Inertia below border is absent and speed of rotation there can be any if such rotation is presented. Radius of "black" hole is determined under the formula $R_{bh} = \sqrt{\frac{GM}{g_{\max}}}$. The minimal "black" hole has mass $m_x = \frac{1}{\rho} e_o = 1.859447219 \cdot 10^{-9} \text{ kg}$.

Its radius coincides with the size of a lattice of ZS (8).

VII. Possible practical technologies

In case the structure of **ZS** really exists approximately in such kind as is described above there are fantastic opportunities for its management, which influences gravitation, propagation of light, etc. It is possible to affect structure with the help of radiation by gamma - quanta, acceleration, by constants and variable magnetic "field". Acceleration with a view of their compact realization should be rotary type (centrifugal acceleration).

- 1) Radiation of gamma - quantum's generates deformation of ZS $h\nu = e_o E \Delta r_e$. Probably, the choice of frequency defines a degree of deformation. Finishing till a birth of electrons and positrons is undesirable owing to their annihilation cases.
1. Rotary acceleration can be executed by the compact design convenient of the device with moving in space without use of the usual jet engine. Thus forces of inertia decrease. Dispersal can be very fast without harm for alive objects. The formula of calculation $a_{rot} = 4\pi E_{\sigma} S (\Delta r)^2$. This way is the most effective in a kind of relative simplicity of realization.
- 2) It is convenient to apply variable magnetic "field" at which are combined rotary acceleration and action of magnetism on deformation of ZS $\Delta r_B^2 = \frac{\sqrt{G\eta}}{4\pi E_{\sigma} S} B$.

The vector of deformation gives a choice of a direction of movement of the device. In a limiting case the device loses property of inertia and becomes invisible.

Instead of the conclusion

There is plenty of scientific works on theoretical physics. Practically for foreseeable time it is impossible to read, understand all articles and the books devoted to the physical device of the Nature. One important circumstance inherent in theories is found out. If in an article there are no such mathematical receptions, as matrixes, Christoffel functions, etc. And to them similar this article is considered as having a low scientific level. Many the physics, achieved wide recognition and occupying authoritative position in scientific circles, consider, that basically the consistent picture world devices is created. It is necessary to finish minor problems and all will be completely finished in understanding of functioning of the Nature. Hopes for safe end of this mission are assigned to a number of experiments with application of super-power accelerators and on the advanced powerful mathematics. Acquaintance with theoretical

physics results in the opposite conclusion. In addition, the main reason for it is defined by that: any mathematics is powerless without good **physical model**.

The mathematical model can ignore the important experimental data. For example, light propagation in vacuum. Exception of currents of displacement in electromagnetic waves physically liquidates an opportunity of their propagation.

Viewing of the literature in its list above has given almost nothing at research light carrier **environment** of **ZS**. The most important data are taken from experimental data, instead of from theories. Therefore on the first place the remarkable directory [1] on physics of 1964 is put. Last third XX centuries in education on physics the main place was occupied by theoretical aspects. The laboratory works earlier carefully accompanied any mathematical description in textbooks, have left on a minimum in theoretical teaching book. Achievements of experimental physics are impressing. But the data of experiences are used in theories by strange image. For example, only two elementary electric charges (+) are now known and (-). In their number it is possible to relate formally a zero charge which basically can be replaced with the sum of the specified charges. Convenient reception of the description on the basis of quarks can be not taken into consideration. Only detection of quarks in a free condition can remove doubt. The limited number of charges coming on grate number of masses of more then 2000 particles opened, generates other doubt: whether the mass of particles so basic is as it is accepted in Standard Models (SM)? Therefore search of Higgins particles, which presence it is accepted as criterion for fidelity or denying of SM is so doubtful.

The problem of gravitation, in opinion of the author, remains central and not solved. Not solved problem alongside with a problem of light propagation in space. In the general theory of gravitation the concept "space – time" is used as an independent category in the device of the world. This position contradicts material essence of the Nature. Objects of a matter define space and processes (movement) in them as a course of time. Article [2] is very indicative as a negative example. Theories of strings and superstrings, as well as theories of quantum gravitation, show examples of the same order. The main thing in them: aspiration to describe and whenever possible precisely to satisfy an experiments with the help of extremely complex mathematics.

Papers on a deviation of light in space by heavy gravity objects [3, 24] are interesting. Certainly, it is necessary to take into account observable effects of deviations in cosmos. At discussion at forums of this problem it was found out, that the physical model of a deviation submitted here not always corresponds to supervision. However in work [24] as appeared, the Jupiter solves the problem of definition of a deviation of light but only strategy of the future experience is made.

In article the theoretical value of a delay of light which is passing by the Jupiter is resulted. it is estimated as 1 *microarcsec*. The formula (16) allows estimating also time of a delay of light that is taking place passing the diameter of the Jupiter. This delay is equal 0,0100050 *micro seconds* in comparison with passage of light free space.

In the resulted literature there are original ideas concerning the nature of physical vacuum. But any of these ideas does not assume a support on the fact of transformation of gamma - quantum in a pair electron - a positron.

The author hopes, that the broad of physical problems which here is submitted, will be a good illustration of the opportunities, opening introduction of the space **environment (ZS)** into consideration.

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