NEW INTERPRETATION of GRAVITATIONAL CONSTANT

DIPOLE of SPEED

If a free ring of thin elastic wire to stretch slightly into opposite sides (see Fig. 1a) and then to release, it begin to vibrate and you will see a picture, as shown in Fig. 1b.
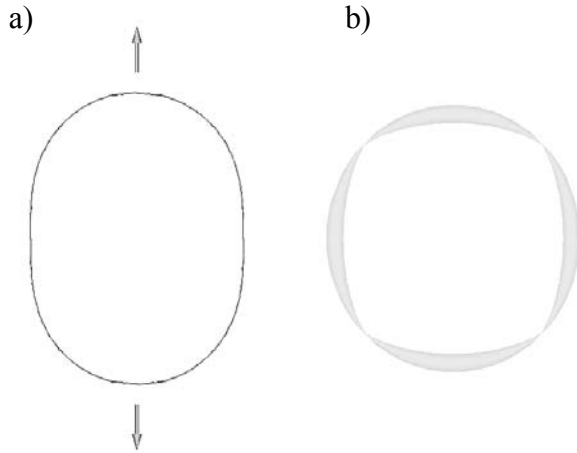
The resonance frequency of vibration of the ring depends on its sizes and elastic modulus of a material of wire. It is considered, that the longitudinal speed of propagation of transversal elastic shear deformations in the ring also depends on an elastic modulus.

Waves of deformations are spread into opposite directions and create standing waves.

Let's look, what will happen, if wave in the ring will be spread only into one direction.

As a carrying agent we shall take a continuous electrical current.

Fig.1
Vibration of elastic ring at first resonance frequency

In Fig. 2 the positions of points A, B and C of the ring at the beginning and at the end of one half-cycle of oscillations of the ring are shown.
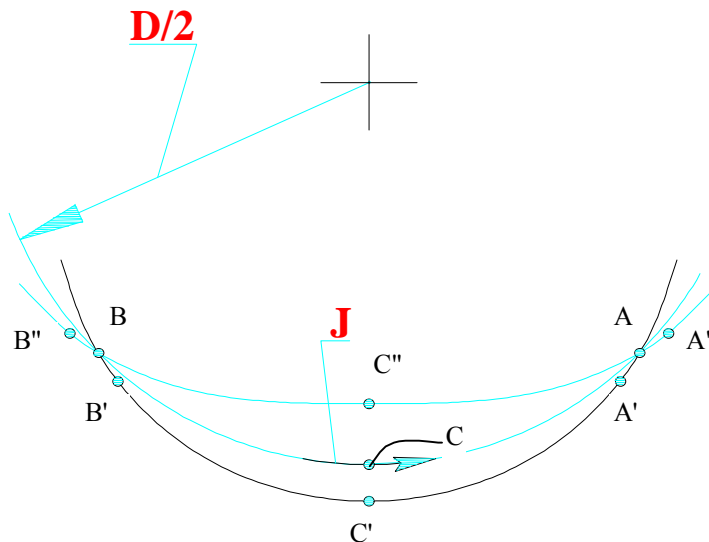
Fig.2
Diagrammatic representation of operation of the dipole of speed

At moving of point C from position C' in position C", the point A goes from position A' to position A", i.e. in direction of the current J. At the same time, point B goes from position B' to position B", i.e. against direction of J. Thus, during the first half-cycle of oscillations of the ring in the point A there is an amplification of current, and in the point B – weakening it. During the

second half-cycle of oscillations the situation will be vice versa. As the current J depends on speed of charges, the process can be presented as addition and subtraction of speeds.

If now to assume as a carrying agent a certain energy, which has longitudinal speed equal to speed of light in vacuum, then we shall have in points A and B different density of this energy, i.e. dipole.

Our experiments and the calculations display, that tangential energy of the dipole is proportional to square of the geometrical figure AC"BC'.

We shall utilize vibrant rings, as the primary simplest model of interaction of streams of different energy. In the nature there are no broken forces and broken streams of energy. There are divergent and concurrent streams, but broken streams are not present. Only in our mathematical fictions there are ruptures and boundary conditions, therefore we frequently appear unable to understand and to explain this or that phenomenon of the nature.

As prolongation of the theme we offer the task about electrical and magnetic interaction between rings both model of annihilation of electron and positron.

ELECTRIC and MAGNETIC FORCES in RINGS

The well-investigated forces of electrical interaction of charges and forces of magnetic interaction of direct currents exhibit much common at research of these forces in ring structures. We have carried out the calculus for rings of an identical diameter D, which are located in one axis at distance z from each other. For the case of electrical interaction each ring was considered as uniformly charged ring line with complete charge q. For the case of magnetic interaction each ring was considered as a ring current $i=q\cdot v$, in which the charge q goes with speed v.

Omitting details of calculation, we shall reduce the finite formulas for forces of electrostatic F_e and magnetic F_m interactions between rings.

$$F_e = \frac{q^2 \cdot c^2}{2 \cdot \pi \cdot 10^7} \cdot \int_0^{2\pi} \frac{z \cdot d\varphi}{\left[z^2 + D^2 \cdot \cos^2\left(\frac{\varphi}{2}\right)\right]^{\frac{3}{2}}} \qquad (1)$$

$$F_m = \frac{q^2 \cdot v^2}{2 \cdot \pi \cdot 10^7} \cdot \int_0^{2\pi} \frac{z \cdot \cos\varphi \cdot d\varphi}{\left[z^2 + D^2 \cdot \cos^2\left(\frac{\varphi}{2}\right)\right]^{\frac{3}{2}}} \qquad (2)$$

The dependence of ratio F_m/F_e to ratio z/D for the case, when the speed of charge in rings is equal to speed of light, is shown in fig. 3.

As it is visible from fig.3, in a limiting case, when z tends to zero, electrical and magnetic forces tend to equilibrium. In practice the similar experience can be fulfilled as follows. It is necessary to make wire rings from nonferromagnetic metal, which can transfer into a state of superconductivity. This metal can be, for example, lead (the point temperature of superconducting state 7.3K). Over lead it is necessary to plot a thin film of dielectric and over dielectric – a film of other metal, for example, copper, which cannot transfer into superconducting state. Then, the rings need to be cooled below temperature 7K and then to induce in lead the electrical currents of identical directions. After that, the rings need to be charged by identical portions of electricity. Thus, the charges on surfaces of rings will be known. The magnetic field in center of each ring we can meter. The generalized force of interaction between rings also can be metered with big accuracy.
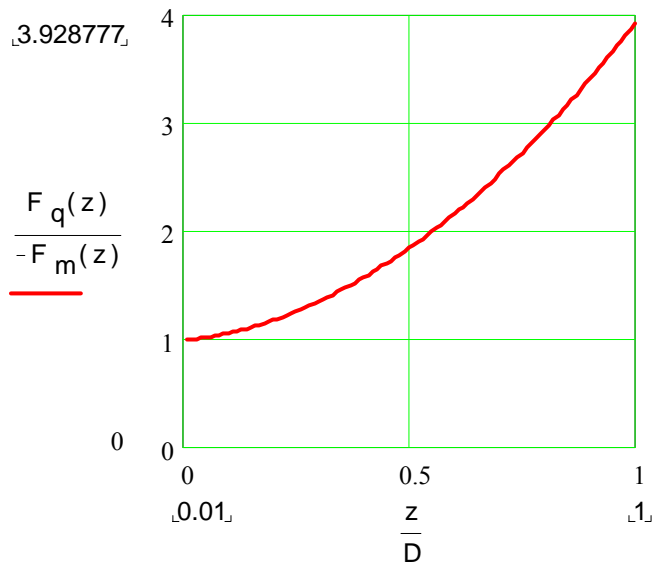
As is known, the electrical current in superconductor flows in thin surface layer. Thus, we can watch interaction between two electrical surfaces, movable and unmovable, which are divided by the thin film of dielectric.

The outcomes of such experience can give the padding information about the space configuration of electrical and magnetic fields in the space between rings.

Fig.3
Character of the ratio of electrical and magnetic forces in rings

ANNIHILATION

In this part of reviewing of the task about interaction of vibrant ring streams of energy we want to offer visual model of the process of annihilation of positron and electron. We shall take into account two sorts of movement of streams – longitudinal (along a line of a ring) and transversal spiral. In experiences with mechanical resonances both sorts of movement are watched, and the trajectory of spiral movement looks like the oblong ellipse or meniscus. In a basis of interaction the principle lays, according to which two unidirectional movements are attract to each other, accordingly, two opposite-directional movements are repel.

In Fig.4 two rings are shown, where in the gap between rings the longitudinal movements have identical directions, whereas spiral movements have opposite directions. Such rings should be repelled at short distances from each other, though at long distances some attraction between longitudinal movements should predominate.

In Fig.5 the upper ring has left-spiral movement (as in the Fig.4), and the lower ring is right-spiral. Thus, both sorts of movements are identical, therefore between rings the attractive forces operate only. Under operation of these forces both rings stick together.

Thus, there can be following two improbable events:

1) Diameter of the doubled ring remains the same, but the longitudinal speed of energy is magnified twice and the amplitude of transversal oscillations also is magnified twice;

2) Diameter of the doubled ring is magnified twice, at that, longitudinal speed of energy and amplitude of oscillations remain invariable.

In both cases the doubled ring cannot stably operate and is destroyed, i.e. rings annihilate each other. In experience this process is watched as two-photons annihilation.
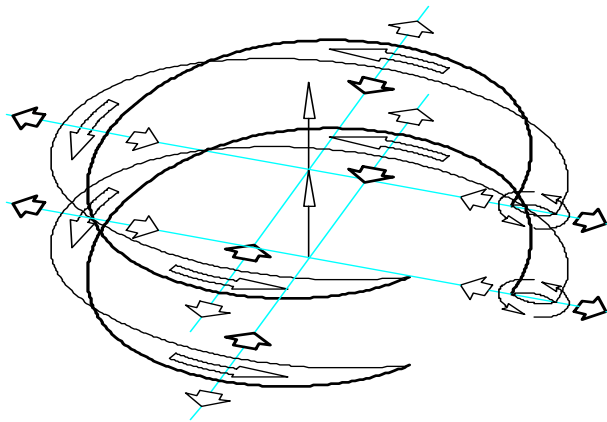
Fig.4
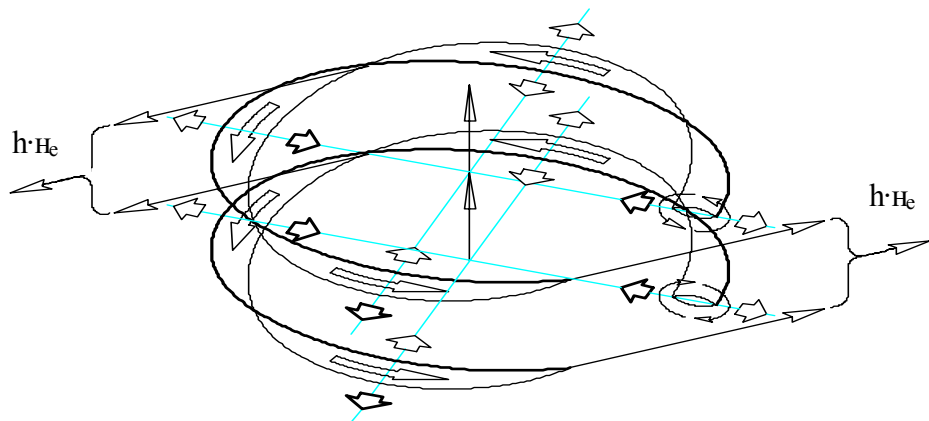**Rings with opposite spiral movements repel each other**

Fig.5
Rings with identical spiral movements annihilate each other

EM-radiation

In an electromagnetic wave the amplitude of a magnetic field lags behind amplitude of an electric field in 1/4 of period. Look at Fig.2. In points A and B the changes of speed coincide in time, but spatially they are divided and, besides, these changes of speed have opposite signs.
The amplitude of radial oscillations in a point C also coincides in time with amplitude of tangential oscillations in points A and B, but in space they are biased in the same 1/4 of period.

We shall allow putting forward the supposition that the radial amplitude is attribute of the electrical component of electromagnetic field, then, accordingly, the axial amplitude should be attributed to magnetic component.

Formulas (1) and (2) and graph in Fig.3 confirm, that the closed electrical and magnetic compositions can be joined and exist together. The external force is necessary for their connection, which would rotate vectors of fields in the necessary direction. The formulas (1) and (2) are classical, in too time they do not contradict quantum mechanics. These formulas speak that the rings vibrate at very high frequencies, i.e. on length of ring many tens (maybe thousands) of half-waves can be located.

We have applied model of vibrant rings to calculation of energy spectrums of atoms, and have found the formula for calculation of a set of own resonance frequencies of atomic oscillators

$$\nu(m) = \frac{c \cdot m^2}{4 \cdot \pi \cdot D} \cdot k_d \qquad (3)$$

where c – speed of light

   m – frequency quantum number

   D – diameter of oscillator

   k_d – coefficient of elasticity
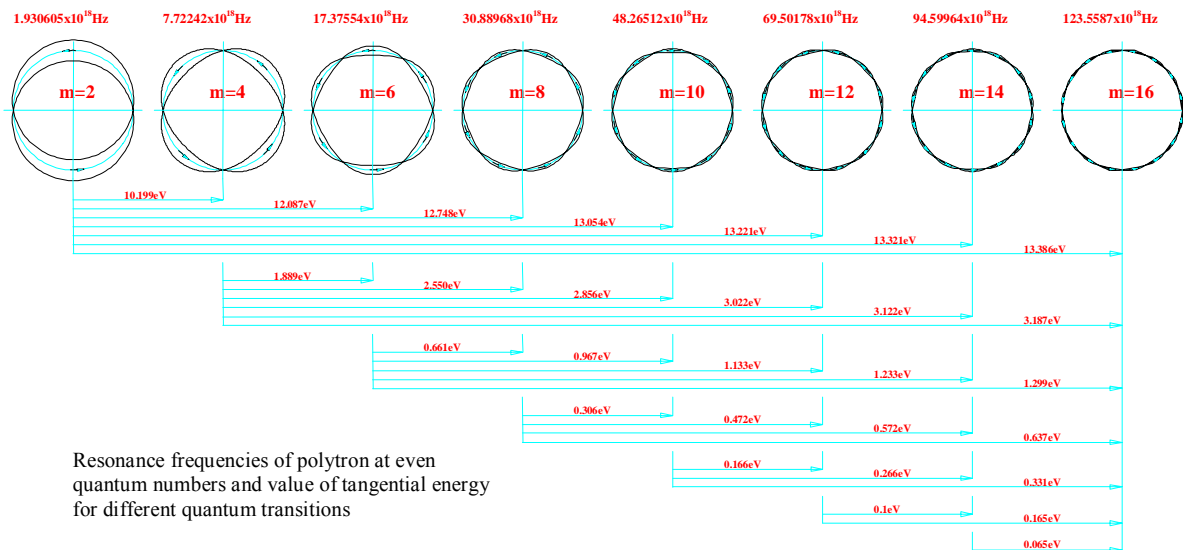
For hydrogen and helium $k_d = 4$.

Fig.6
Quantum transitions in multi-frequency ring oscillator for hydrogen

Pay your attention to two limiting cases.
When m=1, we shall watch "static ring".
When m=∞, we shall watch also "static ring".

TWO SORTS of MASS

The task of gravitation and mass is more complicated. This task is bound up with curvature. If to enter concept "curvature of speed", it will mean radial or centripetal acceleration. The mass, as is known, is determined by means of measurement of acceleration.

Our attempts to explain gravitation and mass with the help of radial acceleration have reduced in rather strange deductions. This strangeness consists in that, the Einstein's dependence of mass on speed and deceleration of time it is possible to explain with the help of vector velocity addition.

The speed of light in vacuum is constant. Experimental confirmation to this is the longitudinal Doppler effect.

In our model we have assumed the condition, that the longitudinal speed of energy in unmovable ring c' is also equal to speed of light c.

Let's research moving of the ring from the point of view of the stationary observer.
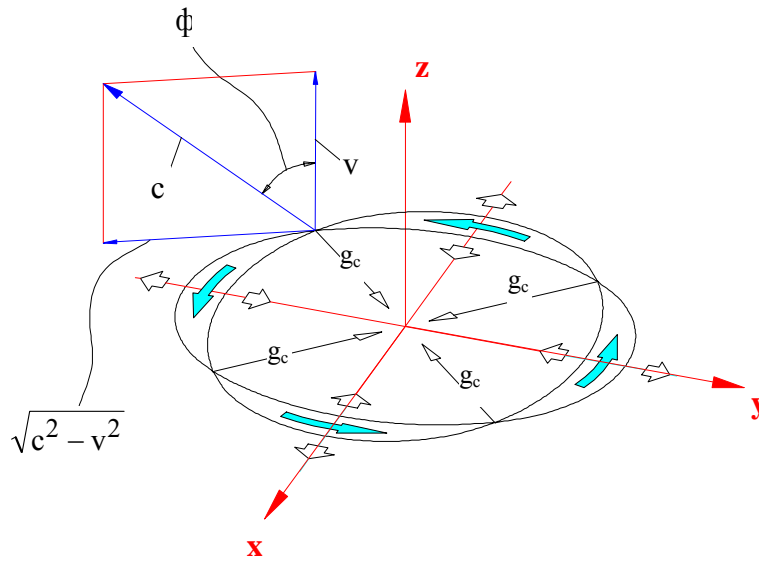
The Transversal Doppler's Effect

Fig.7
The vector velocity addition in transversal Doppler's effect

Apparently, that the ring in fig.7 can move rectilinearly only in the case when the axis of the ring is parallel to the direction of moving. In this case, according to a rule of addition of vectors, the speed *c′*

$$c' = \sqrt{c^2 - v^2} \qquad (4)$$

where *v* – speed of moving of the ring relative to the observer.

The rule of the vector velocity addition operates in all points of the ring equally and, as outcome it, we can watch in experiment the transversal Doppler effect.

If the axis of the ring to tilt on some angle to the direction of moving (for example, with the help of magnetic field), in two opposite halves of ring arises unbalance of speeds. In one half of ring the vector velocity addition yields the sign "+", in other half - sign "–".

Therefore, we again have the dipole of speed, but dipole of other sort. In experiment this dipole appears, as moving of charged particles in a curved trajectory.

The reduced speculative analysis, speaks that the observer cannot "see" the ring in experiment, if the speed of the ring becomes of equal speed of light.

This transition can be interpreted as a stopping of time inside of particle moved with speed of light, and as transformation of the gravitational mass of unmovable particle into "invisible mass" of moved particle, i.e. into energy.

On the other hand, it is possible to interpret transition of mass into energy as inversion of space - time or as inversion of the dipole of speed.

GRAVITATION
Here we offer mathematical model of gravitation on the basis of the following experimental facts:
1) The part of the universe, observed by us, almost completely consists of hydrogen and helium (H~80%, He~20%, to the share of remaining elements of Mendeleyev's Table fall approximately 1% of mass of the universe).

2) Dielectric (and magnetic) constant of dense bodies (solids, liquids and cold gases) differs from the dielectric constant of vacuum.
3) The relict radiation of the universe (Cosmic Background Radiation) corresponds to energy jump between two main quantum numbers n=117 and n=118 in the Balmer-Rydberg's formula for the spectrum of hydrogen.
4) Photons are spread rectilinearly and have no the rest mass.
5) Atoms have a rest mass and can magnify and diminish it at the expense of absorption and emission of photons.

The facts 4) and 5) gives for us the basis to state, that a mass and curvature of speed (i.e. radial acceleration) are inseparably linked each with other.

The mathematical simulation of processes of radiation and absorption of light by multifrequency ring oscillators (by polytrons) has allowed calculating diameter of these oscillators. The value, obtained by us, for hydrogen and helium is equal D=197.714 pm (picometer).

The classical formula for a centripetal acceleration on a line of a circle of diameter D for speed of light c looks like

$$g_c = \frac{2 \cdot c^2}{D} \qquad (5)$$

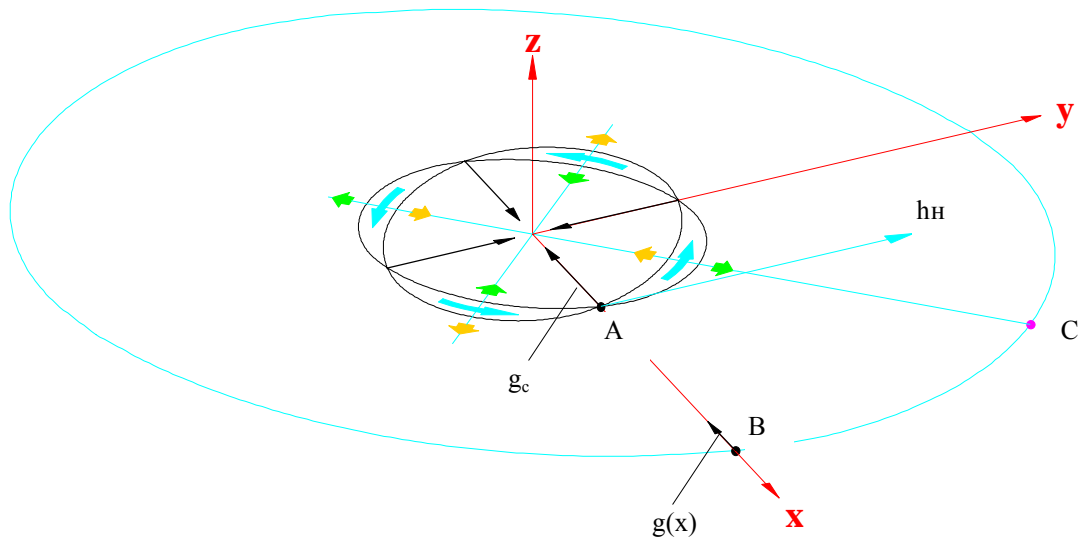The centripetal acceleration g_c operates in the plane of ring (see Fig.8).

Fig.8
Geometrical interpretation of induction of the gravitational constant

In our model the dipoles of speed of the first sort located on the line of circle D, are capable to induce a centripetal acceleration $g(x)$

$$g(x) = \frac{D \cdot c^2}{2 \cdot x^2} \qquad (6)$$

at all distance x from center of the ring in the plane **XY**, except of area inside the ring. Apparently, that in the direction of axis **Z** the curvature of speed misses, therefore for calculation of average statistical value of acceleration in three-dimensional space we should multiply $g(x)$ by 2/3.

$$\overline{g}(x) = \frac{2}{3} \cdot g(x) = \frac{D \cdot c^2}{3 \cdot x^2} = 6.59 \cdot 10^{-11} \cdot \frac{c^2}{x^2} \qquad (7)$$

For calculation of gravitational attraction between two dot objects with masses M_1 and M_2, it is necessary to determine the partial quota (or "part hy weight") of dipoles of speed in that and in the other object.

It can be made by division of mass of the object by speed of light.

$$P_1 = \frac{M_1}{c} \qquad\qquad P_2 = \frac{M_2}{c} \qquad (8)$$

In outcome we have the following formula for calculation of gravitational force between dot masses

$$F_g(x) = \overline{g}(x) \cdot P_1 \cdot P_2 = 6.59 \cdot 10^{-11} \cdot \frac{M_1 \cdot M_2}{x^2} \qquad (9)$$

In Fig.8 the force $F_g(x)$ operates on the line **AB**. As a first approximation it is possible to accept, that in the point **B** this force is constant. In the point **C** the induced acceleration, except of the constant component, has the maximal variable component, as the point **C** is situated opposite of one of maximums of change of curvature of speed in the ring.

Taking into account the fact, that the most part of hydrogen is in interplanetary space at temperature about 0°K, i.e. hydrogen has quantum levels n~117-118 (main quantum number) or m~234-236 (number of half-waves in a multi-frequency emitter), the variable component of a centripetal acceleration in points such as **C** is very small in comparison with the value of constant component of acceleration.

In Fig.8 the direction of photons (arrow *hv*) is shown also. Photons carry the information about quantum levels of an emitter of electromagnetic energy. This information is spread in the same plane, where there is also information about centripetal acceleration *g(x)*.

It is possible, that between energy *hv* and acceleration *g(x)* there is a quite concrete quantitative dependence.

The concept, utilized by us, "a partial quota" is the same formalism, as well as concept "mass". For example, it is possible to express a mass of each object with kelvins ($1kg=6.509651 \times 10^{39}$K). Then, the partial quota of the rest mass of electron will make $P_e=19.78$K.

The simulation, carried out by us, displays, that the gravitational constant is physical properties of hydrogen and helium polytrons, i.e. essentially it is an integral property of two gases, most spread in our Universe.