

THEORY_of_DYNAMIC_PROCESSES_in_GALAXY

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The summary. It is shown, that the SPACE and TIME represent the sum of interchangeable substances of the Galaxy. The force interaction is carried out by means of electromagnetic field according to the law of a relationship of cause and effect $|N| \leftrightarrow |1/N|$ (force \leftrightarrow 1/force). The executed research is the further development of the theory by Russian astrophysics N.A. Kozyrev and helps to develop really realizable experiments on studying of a relationship of cause and effect between space and time, magnetic and electric fields.

Will Let pardon us readers that we begin so global theme with consideration, seemingly, of simple cases of behaviour of standing waves of the various nature and in various environments, but A. Einstein asserted, that – "Nature represents realization of the elementary mathematically conceivable elements". To this thought of the well-known physicist it is necessary to be especially attentive since it was born not on an empty place!

By definition existing in the theoretical physics the standing wave in any physical system can be presented in the form of set quarter wave oscillators, fluctuating in alternating phases. In each quarter wave cell nodes and crests of wave replace each other with the cyclic frequency 2ω twice exceeding frequency of waves running towards each other. Thus there is an alternating transformation of kinetic energy in potential and back. Nodes and crests of wave do not change the position in space; therefore such waves have received the name of standing waves. Thus, if the wave "is locked" with two parties in points of reflexion of waves, i.e. at the "closed" ends it is observed nodes of kinetic energy (zero speed) and crests of potential energy (a maximum of mechanical stresses). At the "not locked" ends of a wave, on the contrary, nodes of potential energy and crests of kinetic energy are observed. But in any case in a standing wave there is no energy carrying over. For maintenance of carrying over of energy it is necessary to shift phases of potential and kinetic energy comparatively each other. The above-stated generalized description of standing waves causes some question to physicists-theorists as suffers obvious uncertainties.

The first question concerns to accuracy of formulations.

If «Nodes and crests do not change the position in space» that why «In each quarter wave cell nodes and crests replace each other with the cyclic frequency 2ω twice exceeding frequency of waves running towards each other»?

But here that is characteristic for any physical systems.

For occurrence of standing waves "length" of system should be not less than one length of a running wave. If "length" of system is equal even to a resonant half of length of a running wave, i.e. two conditional quarter wave oscillators the standing wave in such system will not arise.

The system will be radiating.

The simplest example is fluctuations of the tense string which fluctuations on the basic frequency (tone) are linearly polarized.

Own frequencies of cross-section fluctuations of a string in length 'l' and with the cross-section S, tense with force F it is calculated under the formula

$$f_{\uparrow} = \frac{n}{2 \cdot l} \cdot \sqrt{\frac{F}{\beta \cdot S}} \quad |\text{Hz}| \quad (1)$$

$n = 1, 2, 3, \dots$ On the ends of a string nodes situate (on a fastening condition).

where: β – density of a material of a string, kg/m^3 .

Speed of cross-section waves in a string

$$v_{\uparrow} = \sqrt{\frac{F}{\beta \cdot S}} \quad |\text{m}| \times |\text{s}^{-1}| \quad (2)$$

A line of resonant lengths of waves

$$\lambda_n = \frac{v_{\downarrow}}{f_{\downarrow}} = \frac{2 \cdot l}{n} = \left(\frac{2 \cdot l}{1}\right), \left(\frac{2 \cdot l}{2}\right), \left(\frac{2 \cdot l}{3}\right), \left(\frac{2 \cdot l}{4}\right), \dots \quad |\text{m}| \quad (3)$$

Actually it is longitudinal speed of longitudinal waves of elastic deformation of a string running towards each other with length of a running wave λ_n , since cross-section speed of various sites of a string regular varies both in time, and on length of a string.

More complex example is a standing wave in a long thin core.

Speed of longitudinal waves in thin, freely suspended core, which cross-section sizes there is less than length of a wave

$$v_{\leftrightarrow} = \sqrt{\frac{F}{\beta \cdot S}} = \sqrt{\frac{E_u}{\beta}} \quad |\text{m}| \times |\text{s}^{-1}| \quad (4)$$

where: β – density of a material of a core, kg/m^3 .

E_u – Young's modulus or the module of longitudinal elastic deformation at a core stretching. Young's modulus is defined accounting way by from a condition of the limiting relation of size of deformation of a core ' Δl ' to initial length ' l ' $\Delta l/l = 1$.

As formulas (2) and (3) are identical also both are confirmed experimentally there is a question – what force in a core replaces force of a tension of a string?

In this case the flexural modulus of a material of a core in addition works, but it in the formula (3) is not present. There is only Young's modulus, and it is connected with cross-section deformations rather conditionally. The theory of arcuation is difficult enough and developed for the decision of applied engineering problems.

Own frequencies of fluctuations of a long thin core in length ' l '

a) The core is fixed in the middle:

$$f_{\leftrightarrow} = \frac{2 \cdot n + 1}{2 \cdot l} \sqrt{\frac{E_u}{\beta}} \quad |\text{Hz}| \quad (5)$$

$n = 0, 1, 2, \dots$ On the core ends crests of amplitudes of fluctuations.

A line of resonant lengths of waves

$$\lambda_n = \frac{v_{\leftrightarrow}}{f_{\leftrightarrow}} = \frac{2 \cdot l}{2 \cdot n + 1} = \left(\frac{2 \cdot l}{1}\right), \left(\frac{2 \cdot l}{3}\right), \left(\frac{2 \cdot l}{5}\right), \dots \quad |\text{m}| \quad (6)$$

b) The core is fixed on one end:

$$f_{\leftrightarrow} = \frac{2 \cdot n + 1}{4 \cdot l} \sqrt{\frac{E_u}{\beta}} \quad |\text{Hz}| \quad (7)$$

$n = 0, 1, 2, \dots$ On one end of a core node, on opposite – crest of amplitudes of cross-section fluctuations.

A line of resonant lengths of waves

$$\lambda_n = \frac{v_{\leftrightarrow}}{f_{\leftrightarrow}} = \frac{4 \cdot l}{2 \cdot n + 1} = \left(\frac{4 \cdot l}{1}\right), \left(\frac{4 \cdot l}{3}\right), \left(\frac{4 \cdot l}{5}\right), \dots \quad |\text{m}| \quad (8)$$

c) The core is fixed on both ends or freely suspended on not elastic threads:

$$f_{\leftrightarrow} = \frac{n}{2 \cdot l} \sqrt{\frac{E_u}{\beta}} \quad |\text{Hz}| \quad (9)$$

$n = 1, 2, 3, \dots$ On the ends of a core or nodes, or crests.

A line of resonant lengths of waves

$$\lambda_n = \frac{v_{\leftrightarrow}}{f_{\leftrightarrow}} = \frac{2 \cdot l}{n} = \left(\frac{2 \cdot l}{1}\right), \left(\frac{2 \cdot l}{2}\right), \left(\frac{2 \cdot l}{3}\right), \dots \quad |\text{m}| \quad (10)$$

Even more complex example is a sound wave in a long pipe.

The elastic sound wave is called as longitudinal if fluctuations of particles occur in a direction of wave propagation. The elastic sound wave is called as cross-section if particles of environment fluctuate in planes, perpendicular to a direction of wave propagation. Hence, the standing wave in gas is a cross-section wave in crests and a longitudinal wave in nodes. Accordingly and at a running wave of radiation there are both components.

In a cylindrical column of gas, in a pipe in length ' l ', standing waves behave as follows. If both ends of a pipe are closed or opened, frequency of fluctuations of particles of gas can be calculated under the approached formula

$$f_{\updownarrow} = \frac{n \cdot v_{\phi}}{2 \cdot l} \quad |\text{Hz}| \quad (11)$$

$n = 1, 2, 3, \dots$ On the ends of a core or nodes, or crests. ($2 \cdot l/1, 2 \cdot l/2, 2 \cdot l/3, \dots$).

If one end of a pipe is closed, and another is opened that

$$f_{\updownarrow} = \frac{(2 \cdot n - 1) \cdot v_{\phi}}{4 \cdot l} \quad |\text{Hz}| \quad (12)$$

$n = 1, 2, 3, \dots$ On one end of a core node, on opposite – crest of amplitudes of cross-section fluctuations ($4 \cdot l/1, 4 \cdot l/3, 4 \cdot l/5, \dots$).

where: v_{ϕ} – phase speed of waves in gas.

There is a following question – what speed of waves can be in a standing wave in gas?

We can speak only about «length of a standing wave», as about distance between next crests or the next nodes. It should be the length of a running wave since waves running towards each other are shifted in a phase on an angle of π create on length of a pipe interleaving areas of the compressed and rarefied gas. Speeds of longitudinal sound waves under various thermodynamic conditions are precisely enough measured in gases experimentally or exact enough formulas are developed for their calculation. Accordingly, in areas of the raised pressure there are the cross-section forces operating on walls of a pipe. Hence, and the pipe to some extent influences «length of a standing wave». In such cases it is considered, so-called «effect of the attached mass», used in aerodynamics. More exact empirical formulas consider the relation of length of a wave to radius of pipe $R \ll \lambda$ and a design of the ends of a pipe (with flanges or without them). In a short pipe in length $l = \lambda_n/2$ longitudinal standing waves do not arise, since such pipe radiates a sound in a longitudinal direction. But cross-section waves are present in a short pipe.

Even more complex example is standing electromagnetic waves. Complexity consists that we do not have techniques of direct visual supervision of such waves. All methods indirect, and all bring errors in results of research.

The closed electromagnetic system in which existence of standing electromagnetic waves is possible consists of the toroidal coil which ends are attached to round plates of the condenser. The backlash between poles of such air electromagnet is simultaneously a backlash between condenser plates. It is considered, that the magnetic field of the toroidal coil is completely localized in coil volume though abundantly clear, that because of isolation of magnetic lines in a toroidal design of the coil it is impracticable. If on internal diameter of torahs convolutions of coils to lay down "smoothly", i.e. a convolution to a convolution then on external diameter of torahs the backlash between wires will be comparable to diameter of a wire. Lines of a magnetic field will become isolated through these backlashes. If to make the coil by cut of a narrow spiral crack in a hollow thin-walled toroid the magnetic field will "filter" through cracks and a thin layer of a current.

The magnetic intensity on an axial line of the toroidal coil is calculated under the formula

$$H_c = \frac{N \cdot I_c}{2 \cdot \pi \cdot R_c} \quad |\text{A} \times |\text{m}^{-1}| \quad (13)$$

where: R_c – Average radius of torahs (radius on an axial line);

N – number of convolutions;

I_c – force of a current in coils.

The product $N \cdot I_c = E_m |A\text{-turns}|$ is magnetomotive force.

Intensity of magnetic field on an axis of infinitely long solenoid is equal to product of force of a current by number of convolutions falling on unit of length of the solenoid

$$H_c = n \cdot I_c = \frac{N \cdot I_c}{2 \cdot \pi \cdot R_c} \quad |A| \times |m^{-1}| \quad (14)$$

That is, it is precisely same formula, as for a magnetic field on an axis of torahs. Therefore, we can calculate with enough high accuracy magnetic energy of torahs, using formulas for a magnetic field of infinitely long solenoid.

Own energy of an electric current is energy of its magnetic field.

Let's make calculation for a design thin-walled torahs with radius of coils 25 mm and radius on axial line $R_c = 50$ mm, at magnetomotive force $E_m = 10 |A\text{-turns}|$. By the mechanical equivalent of such resonant system can be a tense string in which the length of a running wave of the first resonance is equal to the doubled length of an axial line of torahs $\lambda_l = 4 \cdot \pi \cdot R_c = 0.628 |m|$.

Number of A-turns on unit of length $n = E_m / 2 \cdot \pi \cdot R_c = 31.831 |A\text{-turns}| \times |m^{-1}|$.

Having executed calculation under formulas by Hopkings for the closed magnetic chain we will receive average value of intensity of a magnetic field inside of torahs $H_t \approx H_c = 31.831 |A/m|$.

Volume density of energy of a magnetic field in vacuum

$$w_m = \frac{\mu_0 \cdot H^2}{2} \quad |A^2| \times |m^{-2}| \rightarrow |N| \times |m^{-2}| \rightarrow |J| \times |m^{-3}| \quad (15)$$

Volume of the chosen by us design of torahs $V_t = (\pi^2/2) \cdot (R_c)^3 = 6.169 \times 10^{-4} |m^3|$.

Stock of magnetic energy in data torahs at magnetomotive force 10 |A-turns|

$$W_m = \frac{\mu_0 \cdot H_c^2 \cdot V_t}{2} = \frac{\mu_0 \cdot E_m^2 \cdot R_c}{16} = 7.854 \times 10^{-7} \quad |J| \quad (16)$$

At resonant fluctuations of an electromagnetic field energy of a magnetic field inside torahs should pass completely in energy of electric field in a backlash between condenser facings. The area of plates of the condenser is set by a design of torahs. For calculation of intensity of electric field in a backlash of the condenser it is necessary for us to be defined with size of this backlash.

Volume density of energy of an electrostatic field in vacuum

$$w_e = \frac{\varepsilon_0 \cdot E_e^2}{2} \quad |V^2| \times |m^{-2}| \rightarrow |N| \times |s^{-2}| \quad (17)$$

In our work on research of geomagnetic field the length of elementary dipole has been defined $\Delta l_e = 4.426 \times 10^{-15} |m|$, which value in $\pi/2$ times more classical radius of electron.

<http://www.sciteclibrary.ru/eng/catalog/pages/11946.html>

http://vlamir43.narod.ru/THE_MOST_MYSTERIOUS_FIELD_e.pdf

We suppose that the backlash size between condenser facings should be to multiple length of an elementary dipole. Under the chosen condition the optimum arrangement of electric charges on condenser plates will be provided.

From a condition of equality magnetic and electric energies in the toroidal resonator

$$W_e = \frac{\varepsilon_0 \cdot E_e^2 \cdot \pi \cdot R_c^2 \cdot n_c \cdot \Delta l_e}{8} = W_m = 7.854 \times 10^{-7} \quad |J| \quad (18)$$

where: n_c – number of layers of elementary dipoles between condenser facings.

A number of values of $E_e^2 \cdot n_c$ is deduced from the formula (18) at which formation of standing electromagnetic waves in the toroidal resonator is possible.

$$E_e^2 \cdot n_c = \left(\frac{32 \cdot c^2}{10^{14} \cdot \Delta l_e} \right) \cdot \frac{8.584}{R_c^2} = 8.924 \times 10^{22} \quad |V^2| \times |m^{-2}| \quad (19)$$

In table 1 some values of intensity of electric field and peak voltage on condenser facings are resulted at various size of a backlash between its facings.

Table 1

n_c	10^0	10^1	10^2	10^3	10^4	10^5	10^6
E_e [V/m]	2.987×10^{11}	9.447×10^{10}	2.987×10^{10}	9.447×10^9	2.987×10^9	9.447×10^8	2.987×10^8
U [V]	0.00132	0.0042	0.0132	0.042	0.132	0.418	1.332

The values of intensity of electric field resulted in table 1 much more electric breakdown strength of vacuum (or dry air). Therefore practically to realize the toroidal resonator with so small air backlashes (less than 1 nm) it is impossible. But the natural phenomena in a kind of beaded lightnings and fireballs specify that in a global electroforce field of the Earth there are conditions for occurrence of ring and more complex closed resonators (without condenser plates) in which there can be standing electromagnetic waves. Practical realization of resonators of standing waves is possible at values $n_c = 10^{10}$ and more. In this case the air backlash between condenser plates makes $10^{10} \cdot \Delta l_e = 4.426 \times 10^{-5}$ [m] \approx 50 micrometers. Intensity of electric field in backlash between condenser facings $E_e = 2.987 \times 10^6$ [V/m], i.e. is a little below penetrative potential for dry air. Amplitude of voltage on condenser $U \approx 132$ [V].

The speed, running towards each other, electromagnetic waves in a cavity of the toroidal resonator is equal to speed of light in vacuum. Speed of light is present at the formula (19). The length of running waves of the first resonance is calculated on a condition that on an axis of torahs should keep within two quarter wave cells.

In electromagnetic resonant system it is valid: *«In each quarter wave cell nodes and crests replace each other with the cyclic frequency 2ω twice exceeding frequency of waves running towards each other»*. But it is nodes and crests of various fields (electric and magnetic) which phases of fluctuations are shifted in time for a quarter of the period of fluctuations. Cyclic frequency of electromagnetic fluctuations is equal $\omega = c/2 \cdot R_c = 2.998 \times 10^6$ [1/s]. Accordingly, frequency of the first harmonic in the resonator is $f_1 = 4.771 \times 10^8$ [Hz]. Check of the above-stated calculations under Thomson's formula and other formulas of a radio engineering completely confirms the received results at number of convolutions in toroidal coil $N = 19$. On a place of 20th convolution the condenser is located.

After such detailed analysis of standing waves of the various natures, and, having armed with sufficient exact mathematics of resonant processes, we can fall outside the limits terrestrial atmosphere and check up a parity of the sizes of two radiation belts (bagels) focused concerning an equatorial plane of the Earth. With it we will be helped by one of members of the first command of cosmonauts – Kirgetov Vladimir Dmitrievich who investigated radiation belts of the Earth not by means of Gayger's counters on satellites, but by effect of «abnormal radio echo». In 2008 he has published the treatise under the name «RADIO ECHO. MAGNETISM. RADIO EMISSION.», which has drawn at once attention not only experts in a radio communication, but also researchers of other directions of electromagnetism.

Here is how he is short characterizes history of the research: – *«Being engaged with sports radiogoniometry on district (I have 3 gold medals of the European championships and 7 gold medals of the World championships on ARDF, not considering silver and bronze), I are regular (within 50 years) had to decide (often – in extreme conditions) various directional and polarizing riddles that has turned to a dynamic stereotype of behaviour, applying various ways (and shifts) for definition (allocation) true bearing from reradiations and polarising distortion of the signals accepted by a manual direction finder. These skills have allowed me at the first experiments with EH and HZ – aerials to define the main feature of a radio emission of H-type – it's "ecliptic" polarization and to "get to the bottom" of an essence of this phenomenon»*.

Kirgetov considers all circumterrestrial space as resonant parametrical system from FOUR hollow resonators with the uniform primary parameter equal to perimeter of the Earth on equator – 40 000 [km]. The first resonator is called as under-ionospheric and has the spherical form with two funnels over geodetic poles of the Earth. Distance from a surface of the Earth to the bottom border of the ionosphere on the average equally 100 [km]. It is only 1.5 % of radius of the Earth. The ionosphere consists of several layers which behave during days differently. The stablest is

the layer “E” (height from a surface of the Earth from 90 to 150 |km |), with a maximum of concentration of the charged particles at height 110 |km |. The length guiding lines along equator $L_0 = 40\,000$ |km | is primary resonant parameter of all volume resonators of the Earth. The length of guiding line between funnels is equal to half of length of the main parameter, and it just is the main condition of formation of the first resonance of standing waves in under-ionospheric layer – length of a standing wave of twice less length of a running wave.

In the researches V.D. Kirgetov has established, that the length of guiding above-ionospheric lines submits to the law of a geometrical progression $L_n = L_0 \times 2^{n-1}$ ($n = 1, 2, 3, 4$). He named these guiding lines magnetospheric as they leave far in space, up to the Moon (average distance from the Earth to the Moon 384 400 |km |).

$$L_1 = L_0 \times 2^0 = 40\,000 \text{ |km|};$$

$$L_2 = L_0 \times 2^1 = 80\,000 \text{ |km|};$$

$$L_3 = L_0 \times 2^2 = 160\,000 \text{ |km|};$$

$$L_4 = L_0 \times 2^3 = 320\,000 \text{ |km|};$$

The way abnormal radio echo lies lengthways magnetospheric guiding lines, and points of reflexion a radio echo can be only in ionospheric funnels of the Earth.

Далее В.Д. Киргетов ставит несколько вопросов, на которые до сих пор нет ответов:

Further V.D. Kirgetov puts some questions on which till now there are no answers:

– Why numbtr of magnetospheric guiding lines only four?

– At what height over a surface of the Earth they pass?

– Why they are observed at very bad passage under-ionospheric radio echo; why only during later evening time of days, and only in the late autumn (for St.-Petersburg)?

Questions rather difficult, however, should be noticed, that to their decision the author has

chosen the approach correctly. As proof of it we will result small endurance from the treatise:

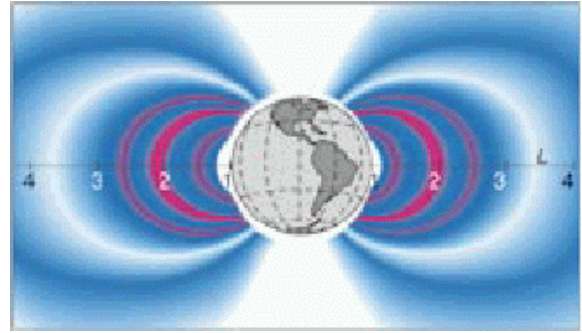
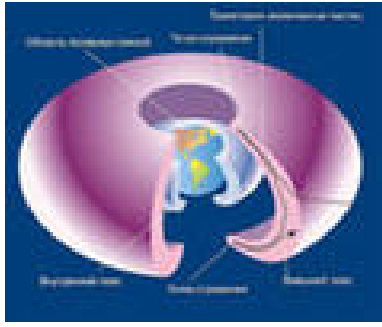
The spatial factor of superrange of distribution RI.

High stability of time of a delay round-the-world ionospheric radio echo says that the under-ionospheric space is the volume parametrical resonator which main parameter is the perimeter of the Earth. It predetermines also parametrical stability of a line of the minimum spatial resistance for round-the-world distribution of a radio emission, i.e. creates effect of "superconductivity" of the circumterrenean under-ionospheric the volume resonator.

It quite corresponds to the theory of the hollow resonators having infinite number of own resonances. With the same confidence it is possible to speak and about "abnormal" magnetospheric radio echo, which time of a delay multiply round-the-world. The length of guiding lines from northern pole to southern also should be multiple to perimeter of the Earth, which predetermines not only time of a delay round-the-world echo (133 |ms|), but also the sizes volume magnetospheric parametrical resonators. These lines possess the minimum spatial resistance, as is the spatial factor of "superconductivity" of lines of geomagnetic resonances and superrange of distribution of radio emission.

Thus, we deal with geomagnetic resonances, as in a radio engineering and in the mechanic so and in magnetodynamics, frequency rate of parameters is a sign of “resonanceness”.

If was considered earlier, that at the Earth there are only two radiating belts (see fiyg. in the left) that in A.M. Galper's article «radiating belt of the Earth» it is proved, that the general radiating belt of the Earth has not less than seven covers (see fig. in the right).



Unfortunately, the author of article, for not clear reason, has not specified distance of these covers from a surface of the Earth, at least, in an equatorial plane.

Therefore, it will be absolutely no wonder, that existence of other hollow resonators located to the Moon, according to V.D. Kirgetov's geometrical progression in due course will be proved. The abnormal radio echo from «a lunar lens» exists and there passes distance from the Earth to the Moon and back for 2660 [ms], in full conformity with accounting 20th jumps of primary parameter.

The question on height of lines guiding is not less important, as in these areas can take place and other abnormal effects which will help to explain the nature of dynamic processes in circumterrestrial space and in all Galaxy. The most obscure question is time of occurrence and existence abnormal magnetospheric radio echo. Apparently, it is connected with rotation of the Earth round own axis and around of the Sun. Rotation of the Earth round own axis should cause rotation of radiating belts, but, most likely, with reduction of angular speed at removal from a rotation axis. Experiment for clearing of this question sees in such plan. It is necessary to suspend over poles of the Earth two stratosphere balloons with the automated equipment trackings a radio echo and to spend supervision during the whole year. Each resonator has guiding line for running waves in an equatorial plane of the Earth. The length of such line and, accordingly, height of its arrangement is simple for calculating, using formulas for a resonance of standing waves, for example, in a core. Cross-section waves between funnels are standing and their length of twice less length of a running wave.

Proceeding from it the formula for calculation of height of an arrangement of magnetospheric guiding lines over a surface of the Earth will look like

$$h_n = \frac{L_0 \cdot 2^{n-1}}{\pi} - R_g \quad |\text{m}| \quad (20)$$

where: $R_g = 6.371 \times 10^6$ [m] – the average radius of the Earth.

On it we finish the research of circumterrestrial space and pass to problem which simultaneously concerns also scales of our Galaxy, and microcosm scales. An occasion is, besides above-stated statement by A. Einstein and quite proved confidence, that galactic dynamic processes should be same, as well as dynamic processes in a microcosm.

In our work under the name «MOST MYSTERIOUS FIELD» (the above-stated references see) two new world constants have been revealed. On conditions of experiments one of them has physical sense of linear density of the charges, the second – the characteristic size of electric dipoles. Both constants have been calculated on the basis of Lorenz's formula for movement of charges in a magnetic field. Therefore any doubts concerning units of measure of these constants did not arise. Presence at formulas (21) and (22) mass of rest of electron easily speaks at recalculation of units of measure.

$$\tau_e = \frac{J_c}{v_e} = \frac{2 \cdot 10^7 \cdot M_e}{\pi \cdot q_e} = 3.62 \times 10^{-5} \quad |\text{C}| \times |\text{m}^{-1}| \quad (21)$$

$$\Delta l_e = \frac{2 \cdot \pi \cdot R_e}{N_e} = \frac{\mu_0}{4 \cdot \pi} \cdot \left(\frac{\pi \cdot q_e \cdot q_p}{2 \cdot M_e} \right) = 4.426 \times 10^{-15} \quad |\text{m}| \quad (22)$$

Value $\Delta l_e = 4.426 \times 10^{-15} |\text{m}|$ by $\pi/2$ times more classical radius of electron.

The velocity of movement of an electron on a ring orbit of radius R_e in a magnetic field of constant ring current J_c , of precisely same radius is equal

$$v_e = \frac{q_e \cdot B_0 \cdot R_e}{4 \cdot M_e} = \frac{\pi \cdot q_e \cdot J_c}{2 \cdot 10^7 \cdot M_e} = \frac{J_c}{3.62 \times 10^{-5}} = \frac{J_c}{\tau_e} \quad |\text{m/s}| \quad (23)$$

At force of a current $J_c = 1 |\text{A}|$, velocity of movement of electron $v_e = 2.763 \times 10^4 |\text{m}| \times |\text{s}^{-1}|$. In our following work under unambiguous heading GRAVITATION "HAS ORDERED LONG_to_LIVE ":

<http://www.sciteclibrary.ru/eng/catalog/pages/11961.html>

http://vlamir43.narod.ru/GRAVITATION_HAS_ORDERED_LONG_to_LIVE_e.pdf

By simple improvement of the formula by Newton for gravitational interaction of two masses, and formulas by Coulomb for interaction of two charges we define three conversion factors:

– Factor for recalculation of mass in unit of an electric charge (Coulomb)

$$\delta_e = \frac{\delta_g^2}{\tau_e} = \frac{1.254 \times 10^{36}}{3.62 \times 10^{-5}} = 3.464 \times 10^{40} \quad |\text{C}| \times |\text{kg}^{-1}| \quad (24)$$

– Factor for recalculation of mass in unit of SPACE (meter)

$$\delta_s = \frac{\delta_g^2}{\tau_e^2} = \frac{1.254 \times 10^{36}}{1.31 \times 10^{-9}} = 9.57 \times 10^{44} \quad |\text{m}| \times |\text{kg}^{-1}| \quad (25)$$

– Factor for recalculation of mass in unit of TIME (second)

$$\delta_t = \sqrt{\frac{\delta_e^2}{F_g}} = \frac{\delta_g^2}{\tau_e \cdot \sqrt{29.44 \cdot 10^{-50}}} = 6.11 \times 10^{109} \quad |\text{s}| \times |\text{kg}^{-1}| \quad (26)$$

Besides, for dynamic processes expression for mass unit recalculation in magnetic streams has been found $(\delta_g \cdot c)^2 = 1.127 \times 10^{53} |\text{Wb}^2| \times |\text{kg}^{-1}|$.

Thus, we have established quantitative relationships between all basic units of measure in system SI, one of which, namely the mass unit of measure $|\text{kg}|$, is auxiliary conversion factor. The concept of mass is formalism, and no physical sense in this formalism is present.

In the official paradigm for recalculation of one units of measure in others energy equivalents are used. In the table of energy equivalents it is brought eight units of measure: energy (1J), mass (1kg), spectral unit (1/m), frequency (1Hz), absolute temperature (1K), energy (1eV), a nuclear mass unit (1u), Hartree energy (1E_h).

By the way, it is rather effective toolkit for promotion of pseudoscientific insinuations against the physicists developing alternative models.

From the name of the table of energy equivalents absolutely clearly, that all equivalents are created by recalculation of one энергий into others. The main difference of our approach consists that we have executed the recalculation based on forces of interaction, using in quality of conversion factor the absolutely «unphysical» unit of mass

Now it is a high time to address to N.A. Kozyrev's axioms. We will state his axioms taking into account results of our last researches.

I axiom. *In causal relationships always there is a basic difference of the reasons from consequences. This difference is absolute, independent of the point of view, i.e. from system of co-ordinates (readout system).*

The basic concept of causal mechanics should be the concept about force as force is the reason of change of states of bodies. In the usual mechanics there is possible a representation about force to replace with other concept – considerably simplifying mechanics. This replacement which completely has been carried out in the nuclear mechanics, absolutely excludes distinction of the reasons from consequences that is why leads to statistical interpretation of the phenomena of the World. The causal mechanics based on distinction of causes and effects, should be mechanics of forces, instead of energies.

II axiom. *Causes and effects are always divided by space-time. The distance between cause and effect can be as much as necessary small, but cannot be equal to zero.*

Consequence existence on some final "distance" from the reason grows out of a long chain of cause and effect transformations. The reason, i.e. force, in the form of an impulse of a moving point, is transferred from one point of space-time to another where it can cause the consequence becoming the reason of changes in following points. Cause and effect are always connected with the different material points, therefore the second axiom is a necessary condition. This circumstance should be underlined special position.

III axiom. *Causes and effects arising in the same point of space, cannot differ and represent identical concepts.*

For example, equality of force affirms as Newton's second law to change of quantity of movement in unit of time. Can seem, that force should be considered as the reason, change of quantity of movement, as consequence of this reason. However, according to III axiom, it is impossible to spend such distinction. These concepts are identical and as did in mechanics Kirhgof, change of quantity of movement of a material point in unit of time can serve as definition of the force enclosed to this point. Thus, Newton's second law should be considered as the law descriptive, as the formula describing the phenomenon. In the usual mechanics, using only II axiom, it is impossible to establish distinctions between cause and effect. From this circumstances, that the consequence is in the future in relation to the reason the following position quite similar to II axiom, first of all, follows.

IV axiom. *Causes and effects are always divided by time. The time interval between cause and effect can be as much as small, but cannot be equal to zero.*

IV axiom leans against existence at time of the elementary property which can be named by scalar or passive. This property allows establishing duration of events or length of the time intervals measured by indications of hours. The basic concepts of kinematics – acceleration and others are defined with the help of this property of time. However this property of time it is impossible to establish distinctions between cause and effect. Really, as well as for space, the time interval sign depends on the accepted system of readout and consequently is absolutely any. It is necessary to notice, that the system of readout of time cannot be fixed and by means of an entropy orientation. Really, transition of mechanical system in more probable condition, i.e. entropy increase, occurs due to continuous smashing of the reasons going in the World: the reasons pass in consequences which become the reasons of other consequences etc. Therefore all system of the account of time, itself based on definition of causes and effects, cannot give anything new and leads to a tautology: the future is there, where a consequence, i.e. there, where the future.

V axiom. *Time possesses the special, absolute property distinguishing the future from the past which can be named by an orientation or a course. This property defines difference of the reasons from consequences for consequences are always in the future in relation to the reasons.*

From resulted above five axioms follows, that time course can be defined in relation to space. Really, from comparison of the second and fourth axiom it is concluded, that the future and the past always are divided as much as small, but not equal to zero, by interval of space. Thus, time orientation can be defined, how a direction in space. From the third and fourth axioms follows, that distinction of the future from the past Δt aspires to zero at $\Delta x \rightarrow 0$.

Obviously, in the World there is some deep principle which has been not opened still by modern natural sciences. This principle hardly probable can be thought up, but it is necessary to search inductive by, solving theoretically for return problems. At such research we should not bypass difficult questions for the theory, and, on the contrary, to focus to them the attention.

But when the basic impossibility to distinguish the reason from consequences then existence of laws cannot be an object of research is postulated and laws turn to describing phenomena of the formula. The theoretical physics of our century has grown on the basis of these sights, and represents a vivid example of the descriptive exact science. Logic and consecutive development of a principle of an equivalence of causes and effects of the exact sciences has led Mach to construction of its philosophy. One discrepancy of this philosophy to all being of our World can already serve as the proof of inferiority of principles of the exact sciences. That itself represents time, till now still it is not known. In the physics on this question there are vague reasons whereas owing to importance of a question followed have written about time the whole volumes. The physicist is able to measure only duration of time, therefore for it time — concept absolutely passive. Now we have come to conclusion, that time has also other, active properties. Time is the active participant of the Universe.

We think that the reader has without effort understood efficiency of application of scientific logic of N.A. Kozyrev at a choice of the main tools for Universe research – instead of eight "energy" equivalents – only three "force" equivalents.

Our subsequent mathematical operations with factors δ_e and δ_t have led us to units of regularity which, at first sight, contradict the usual logic.

Relationship $\delta_e/\delta_t = 3.62 \times 10^{-5} = \tau_e$ |C/s| \rightarrow |N^{1/2}| \rightarrow |A| – should be a constant of linear density of an electricity for the Earth which dimension is equal |Coulomb/meter|, but not |Coulomb/second|. Though, finally, in the classical physics force of interaction between two currents is proportional to product of currents.

Reciprocal value to this parity $\delta_t/\delta_e = 2.763 \times 10^4 = \nu_e$ |s/C| \rightarrow |N^{-1/2}| \rightarrow |1/A| – should be speed electron in an orbit at force of a current in a ring $J_c = 1$ |A|.

Newton's third law says, that forces with which two bodies operate against each other, are directed on one straight line, are equal in value and are opposite in a direction. The verbal formulation of this law is absolutely exact, but here its mathematical interpretation $F_{\rightarrow} = -F_{\leftarrow}$ is an absolute nonsense! This nonsense enters into physics an assumption about zero existence that in the Universe basically cannot be. Including cannot be and absolute zero of temperature. According to our mathematical researches mathematical interpretation, both Newton's third law, and other force interactions, should, as confirmed A. Einstein, to represent "... *realisation of the elementary mathematically conceivable elements*"

$$F_{\rightarrow} = -1 / F_{\leftarrow} \quad (27)$$

According to the principle of a relationship of cause and effect if at the left in the formula (27) there is a reason on the right there will be a consequence. If on the contrary we should pass in other system of readout because in our system of readout there is no physical concept of value which represents quotient from division some number by force.

The result of multiplication of the reason by a consequence reflects the conservation law.

The following logic conclusion from a relationship $\delta_e/\delta_t = 3.62 \times 10^{-5} = \tau_e$ consists in that properties of SPACE and TIME are absolutely identical each other, but we have no right any way to dispose of them, using our mathematical apparatus as the SPACE and TIME concern various systems of readout.

Let's analyse two more relationships from three basic "force" factors:

$\delta_s/\delta_t = 1.556 \times 10^{-65}$ |m/s| – It is possible to interpret as insignificant small speed of expansion of space in time;

$\delta_t/\delta_s = 6.384 \times 10^{64}$ |s/m| – It is possible to interpret as extremely huge density of time in ours (three-dimensional and almost motionless) space.

Insignificant small speed of expansion of space does not go to any comparison with a speed of running away of galaxies on the edge of the Universe (~ 70 |km/s| under Hubble's law).

But, on the other hand, there is also a big doubt that photons, overcoming such huge distances, do not lose iotas of the energy. Any electromagnetic waves at distribution lose energy, but this loss of energy is reflected in change of intensity of a radio emission. Direct experiences on measurement of frequency drift of a radio emission at passage of the big distances simply were not spent in the absence of necessary conditions. If we recognise, that the photon is too an electromagnetic wave loss of internal energy can be one more reason of red displacement of its spectrum only.

As we already have established above, properties of SPACE and TIME are absolutely identical each other, but N.A. Kozyrev has not reflected it in the axioms. At the moment of the publication of the monography, and it was more half a century back, the experimental physics had no convincing proofs of precisely same "passivity" of SPACE, as well as "passive" TIME.

Though *by inductive way* it was possible to guess. For relationalists and orthodox materialists it is a good gift. But "active" properties, both SPACES, and TIME remain till now secret guarded day and night.

We will make an attempt to clear up this uncertainty by the way of analysis of relationship

$$\delta_t/\delta_e = 2.763 \times 10^4 = v_e |s/C| \rightarrow |N^{-1/2}| \rightarrow |1/A|$$

The induction of a magnetic field of a ring current is the reason of occurrence of force which changes a movement trajectory of electron, but for this purpose there should be one more reason – movement of electron with a velocity $v_e = 2.763 \times 10^4$ |m/s|.

In Lorenz's formula this force F_B looks as vector product of two reasons:

$$\vec{F}_B = q_e \cdot [\vec{v} \times \vec{B}] \quad |N| \quad (28)$$

Two reasons pass in two consequences. The first consequence is the force which value is proportional to product of parallel currents (a ring and current of one electron). The second consequence is a turn of the force enclosed to electron (without change of its size), in a direction to the ring centre.

Thus, we can ascertain regretfully, that the modern poor mathematics is not adapted absolutely for the mathematical description of relationships of cause and effect and, especially, for the decision of practical problems.

Before us there is appeared the most complicated problem, which N.A. Kozyrev designated following words: – «*Obviously, in the World there is some deep principle which has been not opened still by modern natural sciences. This principle hardly probable can be thought up, but it is necessary to search inductive by, solving theoretically for return problems. At such research we should not bypass difficult questions for the theory, and, on the contrary, to focus to them the attention*».

Despite the arisen layer of problems, we will finish the decision of the begun problem and on it we will finish our next digression to the theory of relationships of cause and effect.

To accelerate electron till the velocity $v_e = 2.763 \times 10^4$ |m/s| electric voltage $U = 2$ |mV| is required. The formula for calculation of velocity of electron after passage of potential difference U is resulted more low.

$$v(U) = \sqrt{\left(\frac{2 \cdot q_e \cdot U}{M_e} \cdot \sqrt{1 + \frac{q_e^2 \cdot U^2}{M_e^2 \cdot c^4}} \right) - \frac{2 \cdot q_e^2 \cdot U^2}{M_e^2 \cdot c^2}} \quad |m/s| \quad (29)$$

Those positive charges which form a constant electric current in a ring conductor $J_c = 1|A|$ have precisely same velocity also. Consequence of the above-stated analysis is the obvious logic conclusion, that the electric current in conductors is movement of dipoles.

Figuratively speaking, the heteronymic charges which are in a conductor in a neutral condition, under the influence of the enclosed electric field become more active, i.e. turn into reeked-polar "di-poles", and begin one-way traffic. Speed of movement of "di-poles" is proportional to force of a current in a conductor and it cannot be compared to speed of distribution of electric field.

At the velocity of "di-poles" equal to speed of light $v_e = c$ force of a current is equal

$$J_c = \tau_e \cdot c = 1.085124 \times 10^4 \quad |A| \rightarrow |N^{1/2}|$$

I.e., 10 ÷ 11 thousands amperes that corresponds to force of a current in a single linear lightning. Frequency of circulation our trial electron, and, hence, and all "di-poles" in a ring at force of the current creating a magnetic field, $J_c = 1|A|$.

$$v_e = \frac{v_e}{2 \cdot \pi \cdot R_e} = \frac{q_e}{4 \cdot 10^7 \cdot R_e \cdot M_e} = 8.794 \times 10^4 \quad |Hz| \quad (30)$$

Force of a current of one electron $J_e = q_e \cdot v_e = 1.409 \times 10^{-14}$ |A|. Product of two currents on dimension gives force: $J_c \cdot J_e \rightarrow |A^2| \rightarrow |N^{1/2}| \times |N^{1/2}| \rightarrow |N|$.

The quantity of "di-poles" in ring conductors depends only on ring radius

$$N_e = \frac{\tau_e \cdot 2 \cdot \pi \cdot R_e}{q_p} = \frac{4 \cdot 10^7 \cdot R_e \cdot M_e}{q_p \cdot q_e} = R_e \cdot 1.419 \times 10^{15} \quad (31)$$

That obvious fact, that quantity of "di-poles" in a conductor does not depend on diameter of a wire, says that "di-poles" are corpuscles of electric field which are capable to pass in an electromagnetic wave in the presence of the conditions necessary for movement of the running electromagnetic wave. Therefore, we can name this condition of "di-poles" in conductors (or their continuum) the special term – dypolium.

The above-stated formulas and calculations are quite suitable for the decision of some practical problems. For example, for calculation of a mode of a resonance of standing waves (a resonance of currents) which gives essential increase to output power of electromagnetic devices of an alternating current. In the treatise V.D. Kirgetov mentions such way of increase of power welding device. Other researchers inform, that the factor of increase of power has considerable disorder, but explanations to it do not find. We believe, that the problem just and consists in wrong selection of length of standing waves in windings of transformers.

Finishing a theme about relationships of cause and effect between various systems of readout we will result the formula of these force relationship received by *inductive way* which includes four parametres: intensity of electric field E , intensity of magnetic field H , SPACE l^3 , and TIME t^3

$$\vec{E} \cdot \vec{H} \cdot l^3 \longleftrightarrow \vec{H} \cdot \vec{E} \cdot t^3 \quad (32)$$

This formula is deduced in one of our early articles, but for the last years narrow-minded intelligence of those who by occupied position ranks itself as scientists, could not make out behind this formula ideas by N.A. Kozyrev.

<http://www.sciteclibrary.ru/eng/catalog/pages/11876.html>

http://vlamir43.narod.ru/PARALLEL_WORLD_OF_STILL_TIME_e.pdf

THE CONCLUSION

Bolsheviks thirsted to destroy Nikolay Aleksandrovich Kozyrev physically. Subsequently all Soviet scientific elite wiped the dirty feet about its reputation, despite of recognition of its opening abroad. At our time Kozyrev's ideas also cannot punch to themselves road to minds of schoolboys and students because all present scientific elite which, by the way to tell, differs tremendous mathematical ignorance, at all levels interferes with the further development of its ideas.

We not by chance speak about mathematical ignorance. In numerous "quantum" sciences the basis of natural logarithms is used $e = 2.7182\dots$, in which numerical axis is not present uniform bench mark. What scientific article take, the author by all means yes will thrust at least one formula with this number. Mathematical computer programs choke with recalculations of sedate functions of this transcendental number in real numbers. Nevertheless, authors of such articles do not feel pangses of conscience as Heisenberg had allowed them blaspheme in a science.

And here the person who does not have special mathematical education, – V.D. Kirgetov, has found for sedate functions the magnificent basis for such functions, – figure 2, which solves at once all problems. However the scientific elite has refused to him and co-authors in registration of the law of passage abnormal radio echo, as discovery.

On the course of our research of relationships of cause and effect there was a problem which the mathematics did not try to solve at all. It is possible to name this problem as problem of mathematical operators. Everything, on what the modern mathematics is capable so it to "operate" with numbers in "passive" space and in the "passive" time, as what terms would not be called these spaces and subspaces (scalar, vector, space of speeds, space of temperatures, etc., etc.). Such position should be changed fundamentally.

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