3. MATHEMATICAL MODELLING of POLYTRONIC RADIATION

3.1 Definition of spectral energy consumption of radial polytron.

The comparison of the formula for tangential energy of radial polytron with the formula Balmer-Ridberg for frequency of radiation of hydrogen-like atoms speaks about existence of quantitative and qualitative connection between them.

$$w_t(m,n_r)=\frac{1{,}08612\cdot\pi\cdot M_s\cdot c^2\cdot k_d^4}{64}\cdot\left\{\frac{n_r^4}{m^2+0{,}09\cdot n_r^2}\right\} \quad (3\text{-}1)$$

The note: the formula (3-1) is given with the generalized factor $\mathbf{k_o = 2}$
The expression in braces represents the fragment of formula by Balmer-Ridberg

$$\nu_b(m_b,n_b)=c\cdot R\cdot Z^2\cdot\left[\frac{1}{n_b^2}-\frac{1}{m_b^2}\right] \quad (3\text{-}2)$$

where Z – serial number of the element in the Mendeleev's table
n_b and m_b – main quantum numbers (n_b = 2, m_b = 3, 4, … 31)
R = 1.09737312x10^7 м$^{-1}$ – the Ridberg's constant.

The unique difference between these two expressions is, that in the formula (3-2) quantum number $\mathbf{m_b}$ represents number of full waves, and the formula (3-1) frequency order **m** is equal to an integer of half-waves, being packed on length of a circle of static diameter of polytron. Taking into account of this difference, the formula for frequency of radiation of hydrogen polytron has the following kind

$$\nu(m,n_r)=\frac{1{,}08612\cdot\pi\cdot k_d^4}{64}\cdot\left(\frac{M_s\cdot c^2}{h}\right)\cdot\left\{\frac{n_r^4}{4^2+0{,}09\cdot n_r^2}-\frac{n_r^4}{m^2+0{,}09\cdot n_r^2}\right\} \quad (3\text{-}3)$$

where h = 6.626196x10^{-34} |J·s| – the Planck's constant.

The lengths of waves in radiation spectrum of hydrogen have been measured with very high accuracy. Therefore, the check of accuracy of formulas (3-2) and (3-3), best of all, to execute by way of comparing of real lengths of waves in radiation spectrum of hydrogen with the same values received under these formulas.

$$\Delta\lambda_b=\lambda_H-\frac{c}{\nu_b(m_b,n_b)} \quad (3\text{-}4)$$

$$\Delta\lambda_p=\lambda_H-\frac{c}{\nu(m,n_r)} \quad (3\text{-}5)$$

The research of the frequency spectrum with the help of formula (3-3) consist in finding of those values of mass $\mathbf{M_s}$, factor $\mathbf{k_d}$ and amplitude order $\mathbf{n_r}$, at which one the difference have received under formula (3-5) is minimum.
It appears that to this condition satisfies very narrow range of values of the indicated values, which depend from accuracy of the data, presented in the technological literature.
So, for example, the first wavelength of the series by Balmer in a radiation spectrum of hydrogen in one source is equal 656280pm, in other – 656285pm. In this connection, all ratios of values $\mathbf{M_s}$, $\mathbf{k_d}$ and $\mathbf{n_r}$, which give minimum values of difference of experimental and computational lengths of waves under the formula (3-5) were carefully investigated. In outcome, the physical sense of mass of the sphere of static diameter, which has appeared in the formulas of energy as a result of mathematical modelling was detected, and the most probable values of required parameters for radial hydrogen polytron are retrieved:

For λ=656280pm – $\mathbf{k_d}$ = 4.559014144; $\mathbf{n_r}$ = 0.046369394;
For λ=656285pm – $\mathbf{k_d}$ = 2.91295063; $\mathbf{n_r}$ = 0.072572343;

For further calculations, the values, which give the least error on whole radiation spectrum of hydrogen, are selected.

$\mathbf{M_s} = \mathbf{M_e} = 9.109558 \times 10^{-31}$ |kg| – mass of the electron
$\mathbf{k_d}$ = 4 – elasticity electronic quantoide
$\mathbf{n_r} = \mathbf{n_e}$ = 0.052849725 – amplitude order of hydrogen radial polytron.

In Fig.14 the outcomes of matching of real and computational lengths of waves of hydrogen spectrum (in pm), obtained under formulas (3-4) and (3-5) are shown.
The expression in formula (3-3), which is isolated by parenthesis, is equal to Compton's frequency of wave for electron. Thus, the radiation spectrum of atom of hydrogen can be expressed through quite understandable and palpable parameters – frequency of wave of the Compton for electron, number quantons in polytron, elasticity of quantoide and relative value of amplitude of quantoide in quantrons.

$$\nu(m, n_r) = \frac{1{,}08612 \cdot \pi \cdot \nu_e \cdot k_d^4}{64} \cdot \left\{ \frac{n_e^4}{4^2 + 0{,}09 \cdot n_e^2} - \frac{n_e^4}{m^2 + 0{,}09 \cdot n_e^2} \right\} \quad (3\text{-}6)$$

where $\mathbf{\nu_e} = 1.23559 \times 10^{20}$ |Hz| – Compton's frequency for electron.

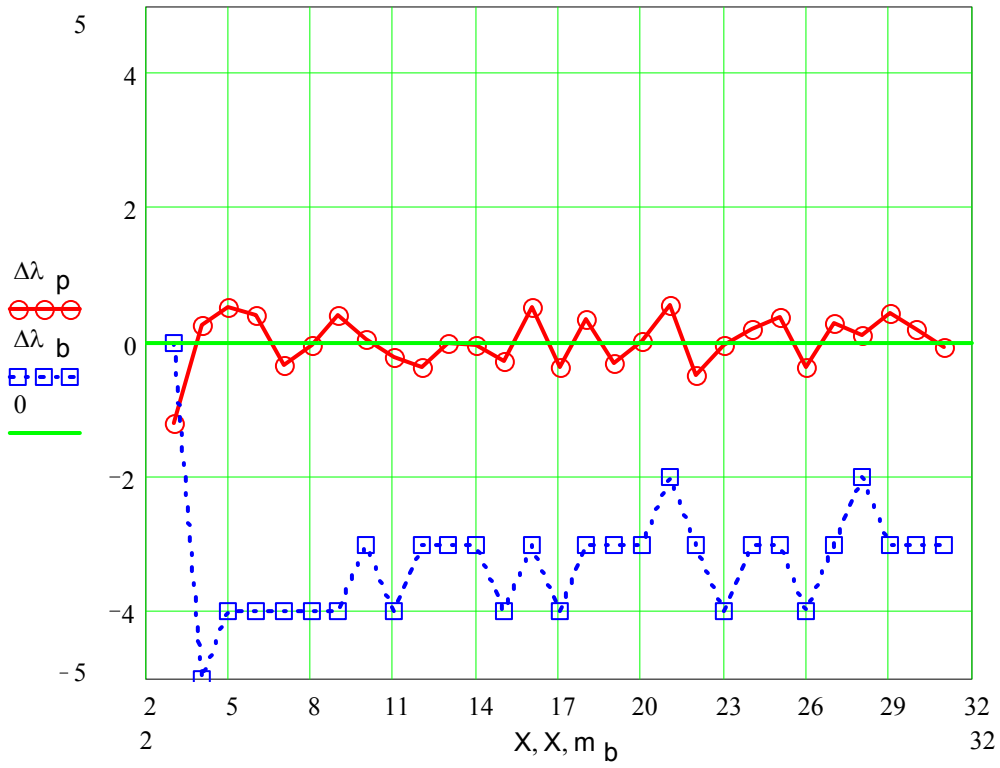

Fig. 14

Outcomes of matching (in pm) of real and computational lengths of waves in the radiation spectrum of atom of hydrogen (series by Balmer). The circles mark accuracy of coincidence at calculation under the formula of radial polytron, small squares - accuracy of coincidence at calculation under the formula by Balmer-Ridberg.

In Fig.15 are shown energies of hydrogen radial polytron, expressed in electron volts. The circles mark values of total energy, horizontal light line – values of radial components of energy, heavy line – values of tangential components of energy and dotted line – values of energy of dynamic layer multiplied by 10.

The value of radial energy is equal 14.09eV and practically permanently in the whole of range of values of the frequency order. At the frequency order m = 2, the curve of radial energy has downturn only 1.288×10^{-6}eV. The difference of tangential energy between values of the frequency order m = 2 and m = 64 makes 13.589eV, that corresponds to potential of ionization of hydrogen atom.

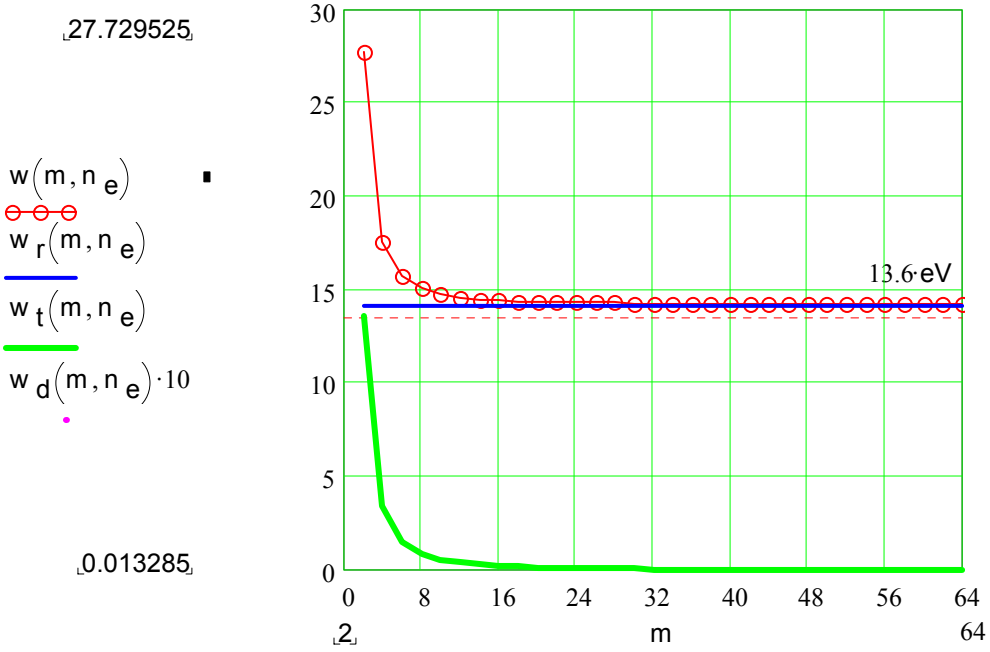

Fig. 15

Energies of a hydrogen radial polytron, in electron-volts.

The expression that is concluded in the formula (3-1) in curly brackets is named as amplitude–spectral energy intensity of radial polytron.
The physical sense of this characteristic is concluded in following.
If polytron is in such conditions, that the amplitude of quantons cannot change (for example, higher than marginal), then it changes frequency of radiation by means of change of the frequency order.
If polytron has the fixed frequency order (for example, free polytrons have the frequency order m = 4), then it changes frequency of radiation by means of change of amplitude of quantrons.
In natural conditions, both gears of radiation operate simultaneously, therefore and there are difficulties at theoretical interpretation of experimental data.
Formula (3-6) conveys the spectral energy consumption of radial hydrogen polytron.
Judge by the spectral characteristics of hydrogen, the amplitude of radial polytrons is limited by the constitution of atom. Therefore, receiving energy from the outside, they are compelled at once to reject it back, or to transmit it into more energy-intensive axial polytrons.
The energy consumption of axial polytron is much higher than energy consumption of radial polytron. If to accept a condition, that the radial and axial polytrons are combined in one dynamic layer, then calculated under formula (2-24) amplitude order of axial polytron will be equal

$$n_a = \sqrt{\frac{0.1875 \cdot m^2 \cdot n_e^2}{2 \cdot \left(m^2 + 4\right)}}$$

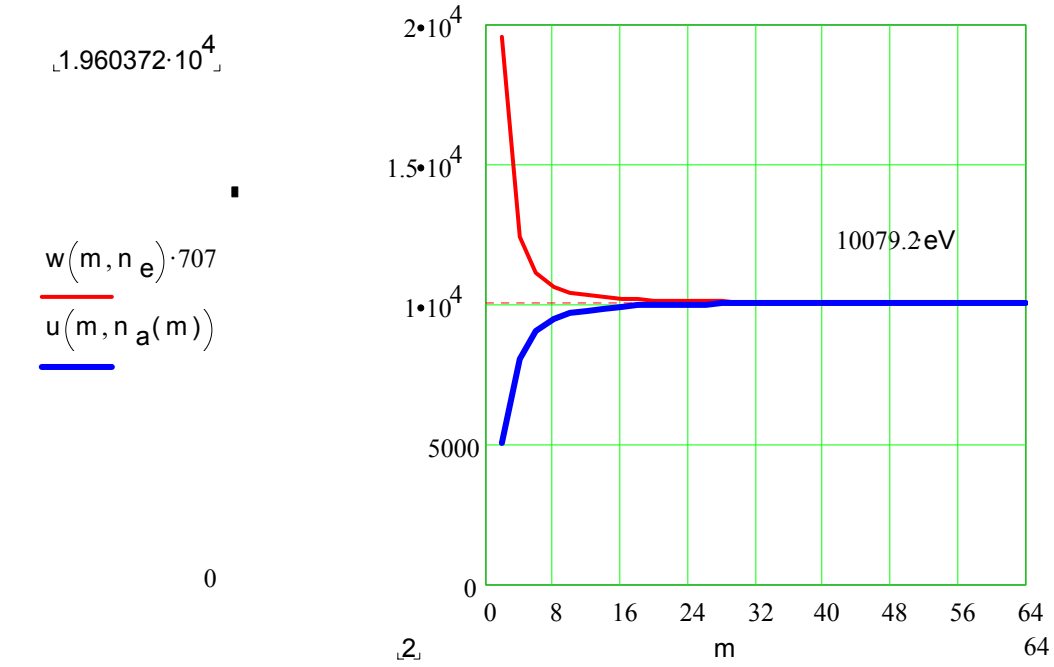

Fig. 16
Total energies of radial (light line) and axial (heavy line) polytrons, working in one dynamic layer.

In Fig.16 the total energy of radial and axial polytrons, which work synchronously in one dynamic layer are shown. Energy of axial polytron at high frequencies is peer 10079.2eV, that in 707 times exceeds energy of radial hydrogen polytron.

3.2 Definition of static diameter of polytrons.
For definition of static diameter of polytrons, it is necessary to know their quantity and positional relationship relative to one another in atom, and their orientation of relative to any crystal axis in atom. By any direct measurements, such data cannot be received, as sizes of atoms make some angstroms only, that outside of range even of indirect ways of measurement.
Taking into account the circumstance, that the radial polytrons are active structural units of atoms and radiate energy under different angles to crystal lattice, there was the hope to take advantage of the information with electron-diffraction of pure matters. For this purpose, it is necessary to have the information about distance between studied sample of matter and photoplate, positions of axes in crystal and the qualitative photo of spots, which is scaled on the angular and linear sizes.
Anything of it does not offered, even in large science-technological libraries, though to receive such data in experiments are simply.
Apparently, the authors and editors of the scientific publications professing materialistic paradigm, so have believed in its infallibility, that have not found necessary to be engaged in such trifles.
Therefore we should take advantage of the most handicraft way.

The molecule of hydrogen consists of two atoms and can occupy either volume of a parallelepiped (in case of two adjoining spheres), or volume of a truncated octahedron (in case of two squeezed into each other spheres).
Concerning number of polytrons in atom of hydrogen, it is possible to reason as follows.
The molecular hydrogen can be crystallized into three kinds of lattices – hexagonal (a=0.3776nm, c=0.6162nm), cubic (a=0.5338nm) and tetragonal (a=0.45nm, c=0.368nm).
If to consider, that atom of hydrogen consisting of one proton and one electron, then, being guided by Fig.1, it is necessary to accept, that in hydrogen atom there is only one radial polytron. Then, it is necessary to accept or spherical shape of atom, or shape of a hockey spacer. Neither one, nor other shape cannot derivate three such as the above packings.
More preferential the version of atom of hydrogen containing four polytrons is. Then the diatomic molecule represents an octahedron, into each side which one is entered one polytron, as shown in Fig.17.

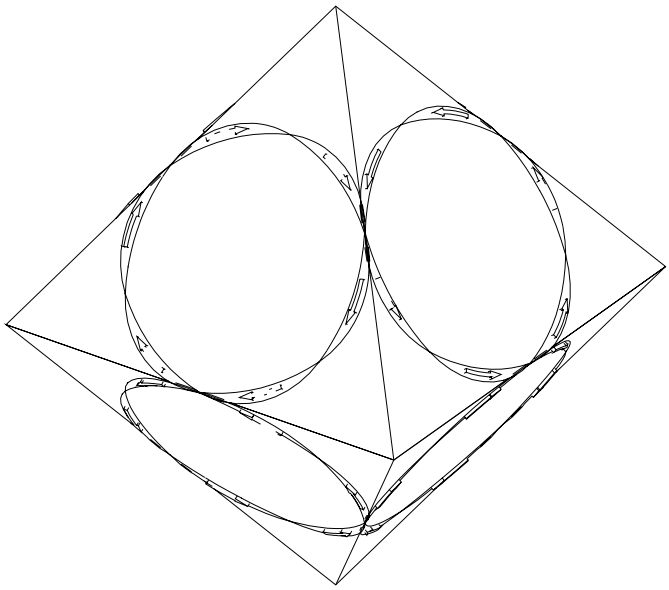

Fig. 17
The probable form of a molecule of hydrogen.
At connection of two atoms in a molecule, the polytrons change the frequency order from m=4 to the frequency order m=6.

In atomic hydrogen the polytrons are paired one another in four nodes and derivate cube-shape with two open sides. The joining of free polytrons to opened sides of a cube is impossible for the reason, that thus the rule of coincidence of directions of ergoline in nodes will be infringed for two from four polytron of atom.

At connection of two cubes by free sides, this rule is not upset. Let's fix to consider the cores of atoms as centers of polytrons, received at connection of polyhedrons (though material cores, as such, in atoms, apparently, is not exist).
The polytrons are incorporate in nodes and under operation of attraction forces between cores of atoms the cubes are transformed into two truncated pyramids, which are joined by basises. At that, the polytrons arranged on sides of cubes, change the frequency order with m = 4 to m = 6. Internuclear distance in a molecule of hydrogen is equal 0.084142nm, and, probably, not too differs from the distance between centers of truncated pyramids.
For the benefit of four-polytronic model of atom of hydrogen the fact speaks also, that first wavelength of radiation for polytron $PTn_e/6R$ (difference of energies at transition with m = 6 to m = 8), calculated under formula (3-6), is equal λ_{6-8}=1875067pm, that corresponds to experimental data for the series by Pashen.
Thus, for rough calculation of static diameter of hydrogen polytron, it is necessary to define this diameter for version of two adjoining spheres and for version of truncated octahedron. The value of real diameter will be arranged somewhere in between them.
Density of solid molecular hydrogen is equal to 76 kg/m^3, the mass of one atom makes 1.67356×10^{-27} |kg|.
The foolproof calculation gives, that the true value of static diameter of hydrogen polytron is arranged in range

$$0.109 \text{ nm} < \boldsymbol{D_s} < 0.280 \text{ nm}$$

At value of static diameter $\mathbf{D_s}$=0.197714 nm, the resonance frequency of hydrogen polytron, calculated under formula (1-14) for the frequency order m = 16 has precisely same value, as frequency of the Compton's wave for electron.
$\mathbf{\nu(16)} = \mathbf{\nu_e} = 1.23559 \times 10^{20}$ |Hz|.
However, this fact cannot be the final proof for the true value of static diameter of polytron. Changing value of static diameter in above limits, it is possible under formula (1-14) "to customize" value $\mathbf{\nu(m)}$ to value $\mathbf{\nu_e}$ for the several frequency orders of polytron.
Point is that, the frequency of the Compton's wave for electron was deduced with the help of the theory of elastic collision of a quantum of electromagnetic radiation with a conditionally free electron.
The analysis of outcomes, which already are obtained at mathematical modeling of interactions of quanta of energy with polytron suggests, that any elastic collision between them is not exist. The quanta of energy cannot as well pass through atoms of matter. There is only process of absorption of quanta of energy by polytrons and process of generation by polytrons of new quanta from that energy, which one is brought with absorbed quanta.
It, maybe, lays the foundation of the sense of continuous up-dating of the universe and its life.
For finding of the true value of static diameter of hydrogen polytron, it is necessary to narrow down range of its probable values. For this purpose, it is possible, to take advantage of a condition of excitation of resonance, according to which one the number of full cycles on quantoide with speed of light should be an integer and should correspond to the frequency order of polytron. Let's designate period of resonant

oscillations of quantoide through **t(m)**, and period of one cycle on quantoide with speed of light through $\mathbf{t_c}$.

$$t(m) = \frac{4 \cdot \pi \cdot D_S}{c \cdot k_d \cdot m^2} \qquad t_c = \frac{\pi \cdot D_S}{c}$$

For holding the condition of excitation and of maintenance of resonance in quantoide private from division $\mathbf{t_c/t(m)}$ should be an integer.

$$\frac{t_c}{t(m)} = \frac{k_d \cdot m^2}{4}$$

In all range before found values of factor of elasticity of quantoide to this condition satisfies only one $\mathbf{k_d=4}$.
Nevertheless, for the greater reliance of regularity of made conclusions it is necessary to fulfill the calculation of energies of polytron under formulas, which contain $\mathbf{D_s}$ as argument, for example, under formula (1-12).

3.3 Simulation of exchange processes with help of dynamic areas

The tangential energy of radial polytron can be very exactly expressed through its dynamic area. In particular, the tangential energy of hydrogen polytron at static diameter $\mathbf{D_s}$=0.197714 nm, is determined with the help of the below mentioned ratio with error not superior 0.0003%.

$$w_t(m, n_e) = 101659 \cdot Q_r \qquad (3\text{-}7)$$

By continuing analogy, it is possible to express through the dynamic area and energy of separate quantum. At such approach, the quantum of energy is expressed, as "the quantum of dynamic area" and is denoted by the **q** character (from the English word quick – fast, alive).
The process of absorption by polytron of quantum **q** is considered, as the act of quantum capture, which attempt to fly through polytron's area. In outcome, there is an increase of the dynamic area of polytron.
Being upset the balance of polytron, should throw out own quanta of energy through nearest free node, or on relay race to transmit the excitation to adjacent polytron. In Fig.18 process of rejecting of quanta of own dynamic area by the exited radial polytron schematically is figured. At moving of an external part of quantoide from the uppermost point to center of polytron, in two nodes of polytron there is an addition of speed of light with tangential velocity of quantoide. In two other nodes, vice-versa, the tangential velocity of quantoide is directed opposite to speed of light. But, as the quanta of electromagnetic energy cannot change the speed, it means, that in two first nodes ergoline is compressed, and in two other – decompressed. In the figure, these compressions and rarefactions are marked by opposite directional short arrows (from a line and to a line of motion of quanta).
Thus, the energy will be rejected from the exited polytron by portions and with periodicity, equal to some support resonance frequency of polytron. Between portions of multiplexed energy, the portions of "emptiness" follow.
However, in the nature there cannot be of emptiness. It is some variety of energy, connected, as well as the first, with space and time.

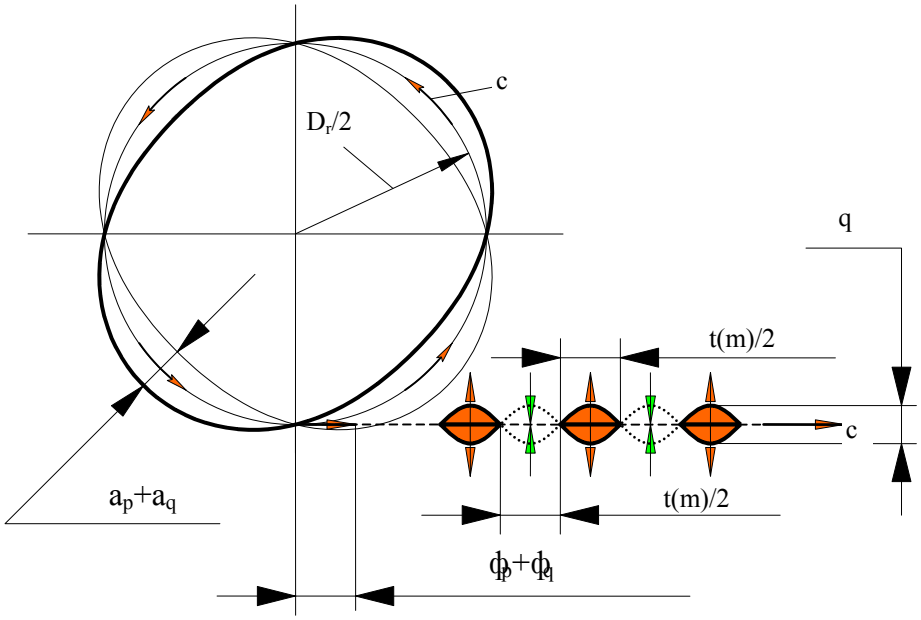

Fig. 18

Diagrammatic representation of polytronic radiation by way of rejecting by radial polytron of quantums of the own dynamic area

Let's set the change of tangential energy of hydrogen radial polytron, connected with absorption and rejection of quanta of the dynamic area, by discrete increasing of the amplitude order $\mathbf{n_e}$ in formula (3-7)

$$Q(m,T)=\frac{101659\cdot\pi\cdot D_s^2}{4\cdot m^2}\cdot\left\{\frac{(T\cdot n_e)\cdot 64\cdot\left(m^2+4\right)}{64\cdot\left(m^2+4\right)+(T\cdot n_e)^2}\right\}^2 \qquad (3\text{-}8)$$

where **T** – the increasing discrete series of numbers, assigned with any step.

The expression in curly brackets is named as amplitude consumption of radial polytron. The curves of this characteristic for three of first even frequency orders of hydrogen polytron are shown in Fig.19.

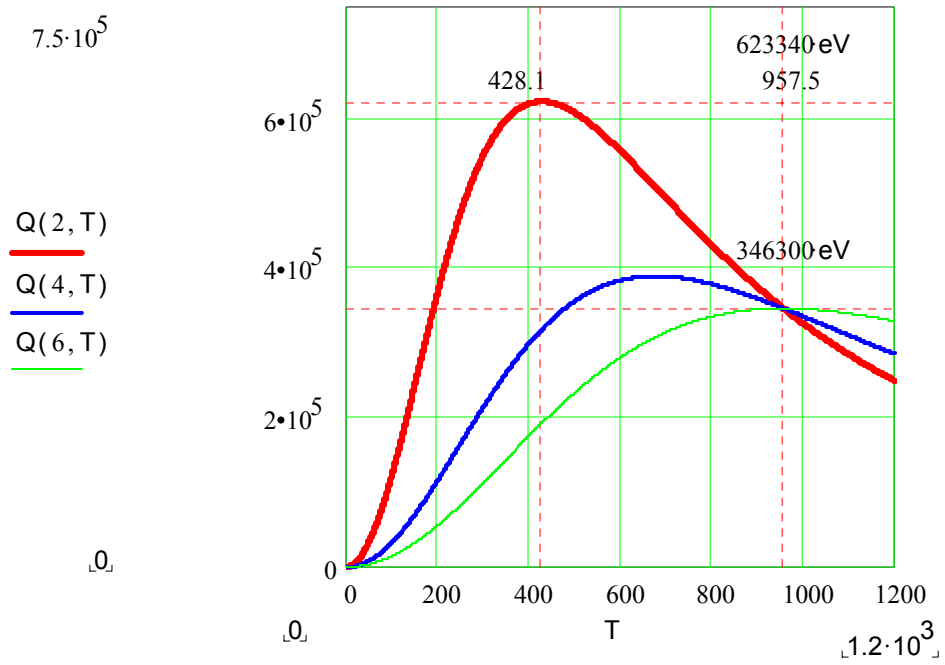

Fig. 19

Graphs of amplitude energy-consumption of hydrogen polytron (in eV) for three the first even values of the frequency order

The top of each of three curves in Fig.19 determine just the one the energy of hydrogen radial polytron at marginal amplitude of quantrons.
The research of equation (3-8) for extremums gives following relation of maximum energy of radial polytron to its frequency order.

$$T_{max} = \frac{8 \cdot \sqrt{m^2 + 4}}{n_e} \qquad (3\text{-}9)$$

In the range of values from $\mathbf{T_0}$ up to $\mathbf{T_{max}}$ polytronic radiation has a continuous spectrum, which one step-wise changes at transition of polytron from one frequency order to other. Of themselves, such transitions are impossible. For this purpose, it is necessary either chemical excitation, or excitation by rays. At chemical reactions the amplitude order of polytrons always remains below than limit value and polytrons have a capability to release superfluous energy and to return into the starting level.
At achievement by polytron of marginal amplitude, the process becomes irreversible and there is the destruction of polytron, which is accompanied by liberation of huge quantities of energy – thermohydrogen reaction.
The top of the first curve Q (2, T) has energy 623340eV. The amplitude order of the free radial polytron with such energy makes $\mathbf{n_r}$=0.726471, that twice less than marginal amplitude orders, which is achievable at mechanical simulation. Polytron is capable to reject energy of rigid X-radiation with length of the first wave λ4→6=18.46 pm.
However, the most probably, the curve Q (2, T) describes process of birth of hot

electrons, which radiate gamma rays of length waves from 18.46 pm up to 10.66 pm. The frequency order m = 2 indicates it.
The second curve Q (4, T) describes amplitude consumption of atomic hydrogen, and, at last, the third curve Q (6, T) – amplitude consumption of molecular hydrogen. All three curves outside of T_{max} converge in one point at T=957.5. Much more likely, in this point the thermohydrogen reaction flows, as a result of which one the hydrogen polytrons are transformed into polytrons of heavier elements.
Newly born free polytron cannot exist at the frequency order m = 2, neither in the shape axial, nor in the shape of radial polytron especially. It should pass to the higher frequency order. It is the frequency order m = 4. Just from this frequency order begin to radiate free polytrons, when in oscillations of quantrons it appears tangential component.
At m = 4 and at total energy of hydrogen radial polytron 511004.1eV, its amplitude order should make $\mathbf{n_r}$=0.69. It more, than in 13 times exceeds the amplitude order $\mathbf{n_e}$. Oscillation amplitude of quantoide on axes of symmetry of quantrons thus makes 1.459pm.
The amplitude order of equivalent axial polytron makes $\mathbf{n_a}$=0.115109, and the amplitude of axial vibrations of quantoide is equal to 1.423pm. The amplitudes of polytrons practically are equal and, therefore, newly born polytron should be volumetric – left-handed or right-handed, with an angle of polarization of amplitude, on axes of symmetry quantrons, close to 45° and with polarized amplitude ~1pm.
The calculation of energy high-frequency and high-amplitude axial polytron at m = 64 and $\mathbf{n_a}$=2.143 displays, that four such axial polytrons can contain in themselves all energy (mass) of hydrogen atom.
The leading of parameter T allows also evaluating an integral spectral characteristic of hydrogen.
By setting in formula (3-1) the increasing of tangential energy, i.e. radiation energy, just so, as it is made in formula (3-8), we receive relation of radiation of polytron depend on parameter T.

$$W_t(m,T)=\frac{1{,}08612\cdot\pi\cdot M_e\cdot c^2\cdot k_d^4}{64\cdot q_e}\cdot\left\{\frac{(T\cdot n_e)^4}{m^2+0{,}09\cdot(T\cdot n_e)^2}\right\} \qquad (3\text{-}10)$$

where $\mathbf{q_e}$ = 1.6021915x10^{-19} – conversion factor of joules in electron volts, numerically equal to electrical charge of electron in coulombs.

In Fig.20 the curves of radiant emittance of hydrogen are shown. The solid heavy line marks the flow of free hot electrons, below the passing continuous line is integral radiant emittance of atomic hydrogen and dotted line is radiant emittance of molecular hydrogen. The solid light line almost conterminous with dotted line, in relative units describes the radiant emittance of bodies, which is circumscribed by formula Stefan-Bolzman. In the range of values from T=0 up to T≈25 for each of three curves there is an own value of the constant by Stefan-Bolzman, which give very exact coincidence of curves.

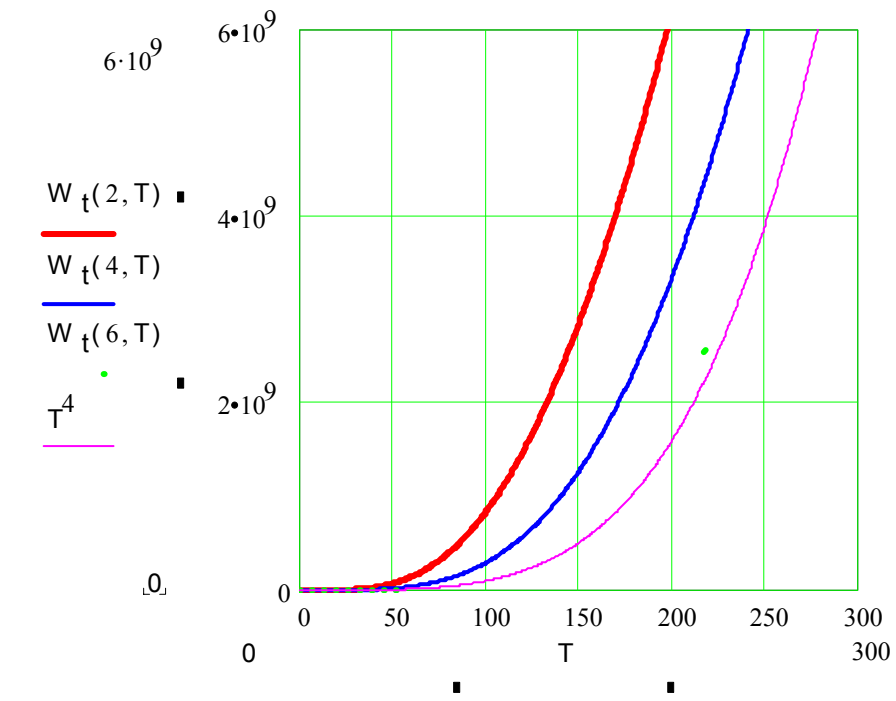

Fig. 20

Graphs of the total emissivity of hydrogen radial polytron (in eV).

3.4 Simulation of electron–positronic annihilation.

The most investigated the version of annihilation is the mutual destruction of electron both positron and transformation of their mass in gamma–quantums with energy of one quantum

$$E_e=h\cdot\nu_e=511004{,}1\ \text{eV} \qquad (3\text{-}10)$$

Three kinds of electron–positron annihilation are established experimentally with arising, accordingly, one, two or three gamma–quantums. The first of them happens at the presence of heavy particles, for example, a nuclear of atom. Other two kinds of annihilation arise at deceleration of positrons in matter. In that case, there is a short-lived system from electron and positron named as positronium. Binding energy of positronium is twice less, than binding energy of hydrogen atom.
At parallel orientation of mechanical moments (spins) the mean lifetime of the couple makes $1.4\cdot10^{-7}$ s, and in summary annihilation arise three gamma–quantums (ortopositrpnium).
At antiparallel orientation of mechanical moments the mean lifetime of the couple makes $1.25\cdot10^{-10}$ s, and in summary annihilation arise two gamma–quantums (parapositronium).
The main energy level of ortopositrpnium is on 0.00084eV above than main energy level of parapositronium.
Most widespread is the two–photon annihilation.
In polytronic model the most probable claimants for roles of electron both positron are left-spiral and right-spiral volumetric polytrons.

Let's study electron and positron, how free volumetric polytrons with the frequency order m = 4, but the first of them will be left–spiral (let it will be analog of electron), and the second will be right-spiral, as shown in Figs.21 and 22.

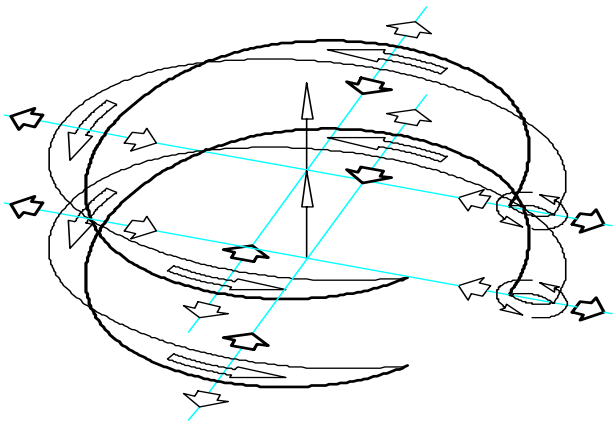

Fig. 21
Two polytrons PT4, imitating interaction of electrons

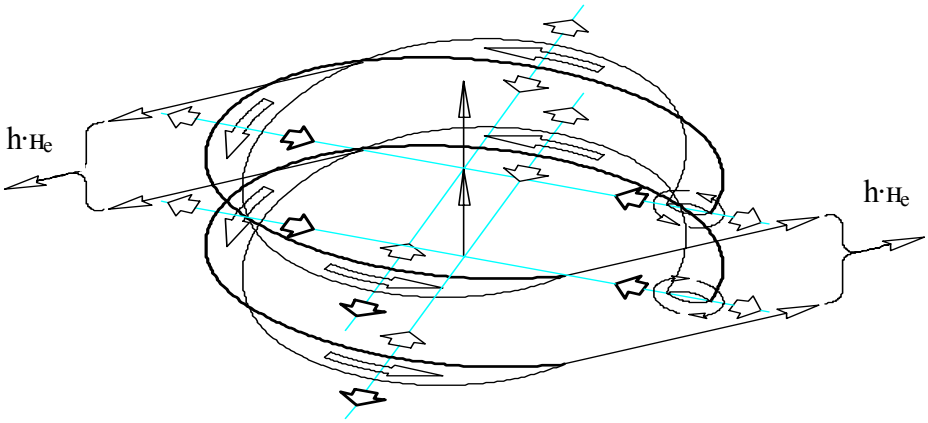

Fig. 22
Two polytrons PT4, imitating interaction of electron and positron.

The amplitude of volumetric polytron changes an angle of polarization at round along quantoide. The rotation of amplitudes is shown in figures, as round arrows in the field of cross–section of quantrons.
Besides, we shall set for polytrons an identical moment of momentum marked in figures by short arrows from centers of polytrons.
In Fig.21 two left-spiral polytrons (electrons) are shown, by way of boundary quantoides, on some distance one above other.
For holding of minimum energy condition of the system from two oscillators, their oscillations should be synchronous and synphasous, and vectors of moments of momentum to have one direction.
The interaction of electrons, as is known, appears in their mutual electrostatic repulsion. The analysis of directions of motions in Fig.21 results in the conclusion, that except of left-spiral interaction between quantrons (the round arrows between quantrons are directed towards one another), of other reason of mutual repulsion of polytrons is not watched. If one of polytrons to invert, counter there will be moments of momentum, that also will cause to mutual repulsion of particles. In Fig.22 in the same situations are shown electron (above) and positron (below). In this case, directions of round arrows between polytrons coincide and, as the outcome, is necessary to expect addition of amplitudes of quantrons and arising of the metastable "double" particle. In the newly originated "double" polytron, the speeds of light both amplitude of electron and positron should be united. The doubling of amplitude of quantoide is equivalent to transition of axial polytron to oscillations with anomalous amplitude and to the sharp increasing of radial components of oscillations. Taking into account that fact, that frequency and energy of gamma–quantum of annihilation always have the same values, it is possible to suspect, that at the moment of annihilation the "double" quantoide is torn in two nodes. The frequency of gamma-radiation, in this case, corresponds to the frequency order of polytron, at which one there was breakup of quantoide, and is determined under formula (1-14). Doubling of speeds of light can be explained in that way, the gamma-quantums fly into opposed directions. Then the speed of their mutual deleting will be equal to doubled speed of light.
The very seldom observable three-photon annihilation can be simulated, as two-photon at the presence of the third light particle, i.e. at the presence of one more electron or positron.

3.5 Simulation of relic radiation of the universe.

The discovery in 1963 of the relic radiation of the universe (Cosmic Background Radiation) has confirmed hypothesis of cooling down the universe and has helped to define more exactly its age.
In this connection, there is a problem, whether it is impossible with the help of polytronic equations to receive the additional information about dynamics of the universe.
According to modern performances, the universe on 70-80% consists of hydrogen and on 30-20% – from helium. Hydrogen and helium are the most mild and most volatile the elements, therefore their density in interplanetary space should be much above than density of other elements. Therefore and the relic radiation of the universe should basically consist of radiation of the cooled down hydrogen and helium. In spectra of hydrogen and helium there are very close lengths of waves. It is λ=1875.065nm in

spectrum of molecular hydrogen and λ=1868.534nm in spectrum of helium. If to suspect, that the frequency of relic radiation is placed on the same curve, on which one there are remaining frequencies in spectrum of hydrogen, then under the formula of radiation of polytron (3-6) it is possible to find a pair of even values of the frequency order, which can give the frequency of relic radiation of the universe.
Let's convert the equation (3-6) in equation, which is more convenient for research of all radiation spectrum of hydrogen polytron

$$\nu(m_o,m)=\frac{1{,}08612\cdot\pi\cdot\nu_e\cdot k_d^4}{64}\cdot\left\{\frac{n_e^4}{m_o{}^2+0{,}09\cdot n_e^2}-\frac{n_e^4}{m^2+0{,}09\cdot n_e^2}\right\} \quad (3\text{-}11)$$

where $\mathbf{m>m_o}$

The step-by-step calculations of equation (3-11) displayed, that at transition from m = 234 to m = 236 polytrons radiate energy on frequency $\nu(234,236)=4.055\cdot10^9$ Hz. The frequency of relic radiation of the universe is peer $\nu_R=4.078\cdot10^9$ Hz. The divergence, perhaps, is connected with radiation of the cooled down helium or with effect of atomic refraction of light.

3.6 Dynamics of tangential amplitudes and speeds in radial hydrogen polytron

The mathematical research of dynamic processes, which happen in polytron, is restricted by research of tangential amplitudes and speeds of quantoide in nodes. This limitation is caused by that, in the existing theory of electromagnetic waves the electrical polarized amplitude is considered. In polytrons all amplitudes are measured in terms of lengths. One is non-comparable to other. However, the tangential velocity in nodes of radial polytron can be compared with speed of light and it gives the additional information about marginal amplitudes of quantrons.
The tangential oscillations of radial quantoide are submit to the sinusoidal law and can be expressed in relative time with usage of cycle $\mathbf{t_c}$

$$\tau(m,n_r,t)=\left[l\left(m,n_r,\frac{\pi}{m}\right)-\frac{\pi\cdot D_r}{2\cdot m}\right]\cdot\cos\left(2\cdot\pi\cdot\frac{m^2\cdot t}{t_c}\right) \quad (3\text{-}12)$$

where, the expression in square brackets represents maximum tangential amplitude in the node, appropriated to the frequency and amplitude orders of radial polytron.
The tangential velocity of motion of quantoide in node is determined, as the first time derivative from expression (3-12)

$$v_t(m,n_r,t)=\frac{2\cdot c\cdot m^2}{D_s}\cdot\left[l\left(m,n_r,\frac{\pi}{m}\right)-\frac{\pi\cdot D_r}{2\cdot m}\right]\cdot\left\{-\sin\left(2\cdot\pi\cdot\frac{m^2\cdot t}{t_c}\right)\right\} \quad (3\text{-}13)$$

Radial polytron of atomic hydrogen, at **m=4** and $\mathbf{n_r=n_e}$ has tangential amplitude $\boldsymbol{\tau_o}=3.389\cdot10^{-15}$ |m| and maximum tangential velocity in nodes $\mathbf{v_{max}}=1.644\cdot10^5$ |m/s|, that makes only 0.055 % of speed of light.

Under formula (3-13) it is possible to calculate the amplitude order of polytron, at which one the tangential velocity could become equal to speed of light. At m=4 the required value of the amplitude order $\mathbf{n_r}$=2.083.
In Fig.23 two boundary quantoides of such hypothetical polytron are shown. The curvature of internal segments of quantoide is negative and, therefore, the oscillations with such amplitudes are impossible.
However, the fulfilled analysis allows making other important conclusion. The conclusion that tangential velocity of mechanical oscillations cannot reach speed of light and that the speed of light is exclusive property of ergoline. This conclusion directly will be agreed with postulates of relativity theory about an inaccessibility of speed of light and about increase of mass or energy with increase of speed.
The calculation of amplitude values of transversal speeds of quantoide displays, that in radial polytron with equivalent energy–mass of electron, the amplitude of transversal speed is peer $0.708 \cdot 10^8$ |m/s|. In axial polytron with the same energy amplitude of transversal speed, it is a little less and is peer $0.668 \cdot 10^8$ |m/s|.

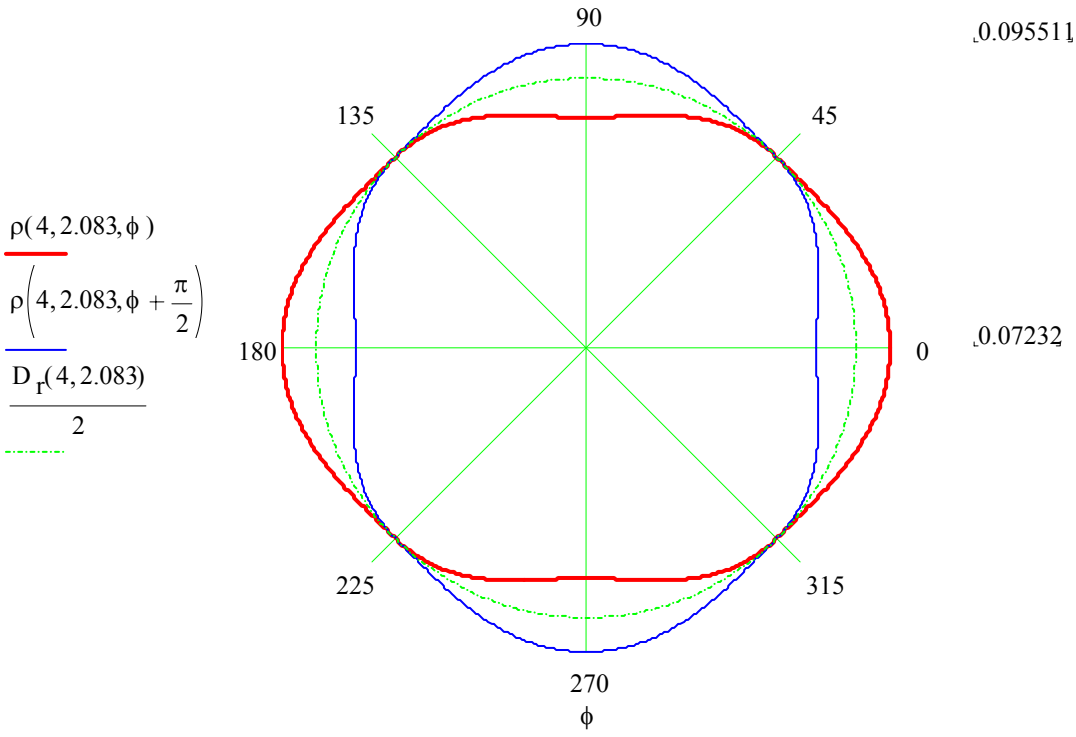

Fig. 23
Two boundary quantoides of hydrogen polytron PT28,9·n_e/4R with a tangential velocity, equal speed of light.

In axial polytron PT0.5/4A the amplitude of transversal speed of quantoide will reach speed of light, and its total energy is peer 9.808 MeV.
The amplitudes of considered polytrons are insignificant as contrasted to marginal and, therefore, the transversal speed of quantoide could exceed speed of light. However, vague there is a question about, whether is real for ergoline the rule of vectorial addition of variable transversal speed with the constant component of ergoline – with speed c.

Rather ambiguous is also, the capability of vectorial addition of constant component of ergoline with peripheral speed of motion v of polytron relative to some frame. In Fig.24 one of versions of such motion – the motion of polytron along vertical axis of coordinate system and probable reallocation of speeds c and v is shown, if the speed of quantum, thrown out from node, should not exceed speed of light.

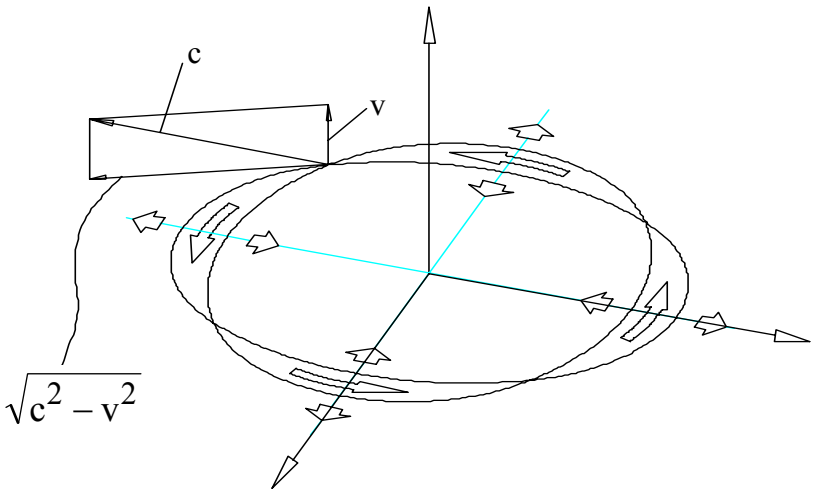

Fig. 24

Possible reallocation of speeds in polytron, which is moving with speed v

If to admit the capability of vectorial addition of speeds v and c, as it is made in Fig.24, it means, as anti-rotation of polytron (arising of rotation of polytron in the direction opposite to the direction of ergoline).
On the one hand, such assumption will be agree with relativity theory and will be explain the frequency drift of radiation for the moving electron.
Besides, the rotation of transversal amplitudes can qualitatively and quantitatively be connected with concept of an inert particle mass.
However, on the other hand, this apparent consent testifies, about unfitness of existing concept of speed for usage it in the energy concept.

THE CONCLUSION

Tendency of the scientists to penetrate into secrets of microcosmos has resulted in bifurcation of physics into classic mechanics of macroworld and quantum mechanics of microcosmos. From the philosophical point of view, it is unacceptable. The laws in the nature should be the same, whether they concern to interactions between galaxies or to interactions between elementary particles.
At probing objects of microcosmos with the help of quantums of electromagnetic radiation or with the help of elementary particles, the investigator is confronted with problem of adequate reflection in the readings of devices of those processes, which one really flow in the investigated object. Therefore, for example, it happened at theoretical interpretation of outcomes of experience of the Compton. Its could be explained as with the help of the wave theory, so with the help corpuscular. You see, it was explained no that, what happened in investigated object, but that, what has taken place in the device. The corpuscular theory has appeared more precisely and its conclusions were adopted. The same, apparently, it happens and at measurements (or calculations) of tandems of waves. On the example of electron-positronic annihilation it is visible, that length of quantum cannot be more, than length of a circle of static diameter. Therefore, in the device not length of the quantum, which has come from an investigated sample, but consequence of excitation of atoms of matter in the device, i.e. stretched in time the process of generation of own, more weak quantums, was registered.
In classic physics, all is much easier. Here, the brain of the investigator perceives the direct facts, and there is no necessity to invent hypothetical models with inexplicable properties.
At physical and mathematical research of polytronic model of hydrogen atom, it was necessary to resort only to one inexplicable property – to zero thickness of quantoide. At the found value of the factor $\mathbf{k_d}$=4, what is completely impossible in an engineering model, instead of thickness of quantoide it was necessary to introduce non-dimensional value of its elasticity. However, it is necessary to notice, that at the analysis of problems of definition of resonance frequencies of a thin long rod and tight cord, the necessity of introduction of a cord of zero thickness too arises. Besides, the objects of zero thickness exist not only in mathematics, but also in the nature. For example, the boundary between two phase states of some substance has zero thickness.
During mathematical modelling begin to emerge and others inexplicable regularities. At the first, it is connection between frequency of radiation and resonance frequencies of the radiator.
If to substitute in the formula Balmer-Ridberg (3-2) for the spectrum of hydrogen (Z=1) the squares of main quantum numbers by the squares of the frequency orders, taken from formula (1-14), then the following expressions are received

$$n_b^2 = \left(\frac{m_o}{2}\right)^2 = \frac{\pi \cdot D_s}{c \cdot k_d} \cdot \nu(m_o) \quad \text{and} \quad m_b^2 = \left(\frac{m}{2}\right)^2 = \frac{\pi \cdot D_s}{c \cdot k_d} \cdot \nu(m)$$

$$\nu_b = \frac{c \cdot R \cdot k_d}{\pi \cdot D_s} \cdot \left[\frac{c}{\nu(m_o)} - \frac{c}{\nu(m)}\right] \quad \text{or} \quad \nu_b = \frac{4 \cdot R}{t_c} \cdot \left[\lambda_o - \lambda_m\right]$$

i.e. the frequency of radiation is proportional to a difference between some supporting wavelength and wavelength, which corresponds to the given frequency order of polytron. This relation is not entered in one of the known theories.
In the second, if in formula (3-10) for coefficient $\mathbf{q_e}$ to assign the dimension of electric charge in coulombs, then at T=1 we shall receive tangential energy of polytron, expressed in units of electric potential, i.e. in volts. As a result of, the legitimacy of potentials arises, which, probably, is linked with physical sense of an electric field and can explain the reason of appearance of the fine structure constant:

$$W_t(2,1) = 13.601779\text{V}$$
$$4 \cdot W_t(4,1) = 13.602421\text{V}$$
$$9 \cdot W_t(6,1) = 13.602539\text{V}$$
$$16 \cdot W_t(8,1) = 13.602581\text{V} \quad \text{etc.}$$

Or

$$\left(\frac{m}{2}\right)^2 \cdot W(m,1) \approx 134 \cdot \frac{\pi \cdot m^2 \cdot (0.3 \cdot n_e)^4}{m^2 + (0.3 \cdot n_e)^2} \cdot \left(\frac{M_e \cdot c^2}{q_e}\right)$$

Or

$$W(m,1) \approx 134 \cdot \frac{(0.3 \cdot n_e)^4}{m^2 + (0.3 \cdot n_e)^2} \cdot \left(\frac{M_e \cdot 10^7}{\varepsilon_o \cdot q_e}\right)$$

In the third, at modelling of electron-positronic annihilation the version of construction of positron from quantums of "vacuum", i.e. from quantums of rarefied ergoline is possible. But, for similar modelling there are no experimental data, that it was possible to test the hypothesis with the help of symmetrical mathematical equations.
The appearance and of other difficult–explained facts is possible.
The primary goal of the polytron concept is the task on detection of paths and methods of unification of the space and the time in one energy parameter, with the help which one any processes and condition of the surrounding world can be calculated. In all fulfilled operations of mathematical modelling, the time, as the direct argument, is absent, and instead of it, the frequency order is applied. However, the same frequency order is included and in expressions for definition of amplitudes. Therefore, the time can be expressed through amplitudes, but for this purpose, there is not some link.
The consideration of the dynamic task in paragraph 3.6 and introduction of relative time did not add any clearness to the problem about connection of time with space. Perhaps, and the time is somehow quantized, then there should be the limit value of the frequency order, unified for all types of polytrons.
The search of these links is branched into many directions and, therefore, is more complicated problem, than fulfilled work. Perhaps, experimental physics does not have even approaching data, which one could be used at the solution of these tasks.