New energy-and-information medium

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Based on the analysis of the material electrically polarized gas-like vacuum (ether) existance (with necessity it results from the electromagnetic waves phenomena itself) the ether particles parameters were determined.

The possibility of excitation in ether a new energy-and-information carrier - polarization waves (P-waves) at ether particles (polars) own freqwency 10^{40} rad/s and with velocities of propogation 10^{20} m/s is shown. No contradictions to relativity arise.

P-waves satisfy requirements to the psychophysical information medium.

1. Introduction.

1.1. At present the only energy-and-information carriers (EIC) in ,,free'' space are electromagnetic waves (EMW), theoretically predicted 120 years ago by Maxwell and experimentally registered by Hertz 20 years later. As a result - radio, television, radiolocation, etc.

1.2. However many of the phenomena observed (biological communication, telepathy, etc.) could not be explaned on the base of EMW, and this fact indicated other EIC occurence. That is why the search of the others continued the next 100 years, up to date.

1.3. After discovery of polarization waves (P-waves) [1] wich are apparently the sought - for EIC, the reason for the prolonged search became clear: the direction of the search was wrong. The fact is that P-waves (as EMW, inter alia) are the disturbance forms of vacuum (ether) whose occurence as a material media was rejected by the official paradigm of natural sciences.

1.4. Further it will be shown that P-waves are the resonance disturbance of ether (at ether eigen frequency). Restrictions on P-waves propagation velocities (they proved to be significantly, by many orders of magnitude greater than the light speed) were not imposed.

2. Ether - the material electrically polarized media.

2.1. The ether materiality and electrical polarizability result from the fact of electromagnetic field (EMF) existance itself.

Actually, from Maxvell equation for ,,free'' space

$$\mathrm{rot}\vec{H} = \varepsilon_0 \partial\vec{E} / \partial t \qquad (2.1)$$

follows that ε_0 - is its polarizability, and

$$\varepsilon_0 \vec{E} = \vec{P}, \qquad (2.2)$$

$\vec{P}$ - polarization.

Moreover, the Lamb's shift of hydrogen atom energetic levels and electron-positron pairs birth by ether indicate the materiality of ether.

The ether properties as material medium are studied very poorly (even its existance as physical substance, as it was noted above, was rejected by natural science official paradigm). However some estimates of its structure properties and parameters can be given presently.

2.2. The representation of ether as gas-like medium is natural. H.Helmholts, J. Maxvell, J. Tomson, W. Tompson, V. Mitkewich kept such conception, V. Atsukovski [2] is developing it.

In accordance with this conception the particles of a matter are vortex forms of this gas-like medium. From 2.1. it follows that not only particles of a substance, but particles of ether (pramatter, prasubstance) are also complex formations.

Actually, as ether particles are electrically polarized, their structure contains at the minimum electrical charges and EMW. Let's call these ether particles polars. Let us call amers the particles of more fine ether component, the polar electric charges and internal EMW being its vortex forms.

So, there are reasons to present ether as gas-like medium of neutral particles (amers) where larger «inclusions» are complex electrically polarized particles (polars) (Pari passu, let's note, that in [2] ether is presented as one-component gas of neutral particles).

2.3. Let's present the polar by Hertz dipole (Fig.2.1) with charges Q_{po} and mass as m_p

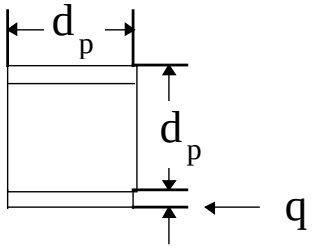

Fig 2.1. Polar Hertz dipole.
d_p - the diameter of the polar, q - the dipole arm.

The direct consequence of such a presentation is:

$$Q_p = Q_{po} q / d_p, \tag{2.3}$$

$$E_p = \frac{4}{\pi\varepsilon_p} \cdot \frac{Q_p}{d_p^2}, \tag{2.4}$$

E_p - electric field strength between the plates of equivalent capacitor;

ε_p - dielectric permittivity of the polar interior medium.

2.4. From the equation of dipole motion

$$m_{p(ch)} \ddot{q} = -\mu_{1p} q, \tag{2.5}$$

$$\mu_{1p} = \frac{4Q_{po}^2}{\pi\varepsilon_p d_p^3}$$

its eigen frequency

$$\omega_{po} = (\mu_{1p} / m_{p(ch)})^{1/2}. \tag{2.6}$$

2.5. The polar charge mass, can be defined from correlation:

$$2m_{p(ch)} = m_p = \rho_p / n_p, \tag{2.7}$$

where ρ_p - the density of polar component of ether,

n_p - number of polars in unit volume.

2.6. The polar diameter can be defined from the value of famous Lamb's shift of hydrogen atom energetic level $\mathbf{2^2S_{1/2}}$ relatively $\mathbf{2^2P_{1/2}}$, caused by atom electron and ether electric charges interaction.

Screening an electron polars, enlarge its effective radius and this reduce its effective charge and, respectively, its electric field energy.

Based upon this phenomenon we obtain

$$Э_{el} = \frac{1}{8\pi\varepsilon_o} \cdot \frac{e_o^2}{r_o + \Delta r} = \frac{1}{8\pi\varepsilon_o} \cdot \frac{(e_o + \Delta e)^2}{r_o}, \tag{2.8}$$

r_0 – classical electron radius,

$$\Delta e / e_o \cong d_p / 2r_o, \tag{2.9}$$

$$d_p \cong 2\Delta r_o \tag{2.10}$$

2.7. The dependence of atom energy levels on the electron charge is defined by famous correlation:

$$E_n = -\frac{mZ^2e^4}{8n^2h^2\varepsilon_o^2},$$

For the case under consideration (atom of hydrogen)

$$E_2 = -\frac{me^4}{32h^2\varepsilon_o^2}. \qquad (2.11)$$

We obtaine

$$E_2 + \Delta E_2 = -\frac{m}{32h^2\varepsilon_o^2}(e_o + \Delta e)^4 \cong \frac{m}{32h^2\varepsilon_o^2}\left(e_o^4 + 4e_o^3;\Delta e\right),$$

$$\Delta e = \frac{8h^2\varepsilon_o^2}{me_o^3}\Delta E_2.$$

2.8. Lamb's shift of $\mathbf{2^2S_{1/2}}$ level relative to $\mathbf{2^2P_{1/2}}$ (level $\mathbf{2^2P_{1/2}}$ does not shift) is experimentally measured and by frequency it is equal (see, for ex.[3]) to:

$$\Delta F_L \cong 10^9 \text{ Hz}.$$

Then

$$\Delta e = \frac{-8h^3\varepsilon_0^2}{me_0^3}\Delta F_L.$$

Accordingly, $d_p = \frac{16h^3\varepsilon_0^2 r_{pr}}{me_0^4}\Delta F_L = 10^{-21}$ m, (2.12)

r_{pr} - proton radius.

2.9. The number of polars in unit volume of ,,free space'' - n_p can be estimated. With critical intensity of external electric field E_{cr}, when the polars dissociate into positive and negative polar charges, we obtain from (2.2) and (2.4)

$$\varepsilon_o E_{cr} = Q_{po} d_p n_p, \quad E_{p(cr)} = \frac{4}{\pi\varepsilon_p}\cdot\frac{Q_{po}}{d_p^2}. \quad . \qquad (2.13)$$

It follows from these expressions:

$$n_p = \frac{4}{\pi}\frac{\varepsilon_0}{\varepsilon_p}\cdot\frac{1}{d_p^3}. \qquad (2.14)$$

2.10. To estimate the dielectric permittivity (polarizability) of the polar interior medium (amer medium) let us consider relation between dielectric permittivity of vacuum media and their densities, wich follows from the vortex conception of the particles structure.

Though this vortex conception is not generally accepted, it gives well-reasoned notions about fundamental particles structure.

In accordance with this conception, proton is presented as vortex toroid (Fig. 2.2).

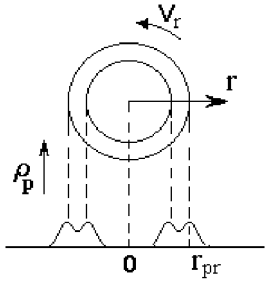

Fig.2.2 Vortex model of proton. V_r - ring velocity of vortex.

If we set mechanical energy of vortex toroid equal to its electric energy:

$$Э_м = Э_{el},$$

$$Э_м = \int_o^\infty \rho_p \frac{V^2}{2} dV = 2\pi\rho_p r_{pr} \int_{r_{pr}}^\infty \frac{dr}{r^2} = 2\pi\rho_p V_r^2 r_{pr}$$

$V = V_r r_{pr}^2 / r^2$ – velocity of external amer medium entrained by rotating ring of amer gas,

$$Э_{el} = \frac{1}{8\pi\varepsilon_o} \cdot \frac{e^2}{r_{pr}}; \qquad \rho_p (V_r S_{pr})^2 = \varepsilon_o (e/\varepsilon_o)^2,$$

$$S_{pr} = 4\pi r_{pr}^2.$$

Then the amers density is:

$$\rho_p \cong \varepsilon_o. \tag{2.15}$$

2.11. From the condition that polar critical polarization comes at the same time with Dirack «vacuum polarization» (that is the same process)

$$E_{p(cr)} = E_{D(cr)},$$

$$E_{p(cr)} = \frac{4}{\pi\varepsilon_p} \cdot \frac{Q_{po}}{d_p^2}, \tag{2.16}$$

$$E_{D(cr)} = \frac{1}{4\pi\varepsilon_o} \cdot \frac{e}{(2r_o)^2}, \tag{2.17}$$

we obtaine

$$\varepsilon_p = \frac{4}{\pi} \cdot \frac{Q_{po}}{e} \left(\frac{2r_o}{d_p}\right) \varepsilon_o = 40\varepsilon_o. \tag{2.18}$$

Then

$$n_p = \frac{4}{\pi} \cdot \frac{\varepsilon_o}{\varepsilon_p} \cdot \frac{1}{d_p^3} \cong 3 \cdot 10^{61}\ m^{-3}, \tag{2.19}$$

$$m_p = \rho_p / n_p \cong \varepsilon_o / n_p \cong 3 \cdot 10^{-73}\ \text{кg}.$$

2.12. The dipole charges value of the polar can be estimated through the electric field critical strength E_{cr} when the polars dissociate and electron-positron pairs are formed (,,ether polarization'' phenomenon).

We obtaine:

$$E_{e(cr)} = \frac{1}{4\pi\varepsilon_e} \cdot \frac{e}{(2r_o)^2} = \frac{1}{4\pi\varepsilon_p} \cdot \frac{Q_{po}}{d_p^2},$$

ε_p, ε_e - dielectric permitivity of polar and electron body accordingly.

When $\varepsilon_p = \varepsilon_e$ we obtaine

$$Q_{po} = e(\frac{d_p}{2r_o})^2 \cong 6 \cdot 10^{-32} \text{ C.} \qquad (2.20)$$

Then

$$\omega_{po} = (\mu_{1p} / m_{p(ch)})^{1/2} \cong 10^{40} \text{ rad / c.} \qquad (2.21)$$

2.13 Interaction between polars is realized through fields of amer component compression (sound waves). About amer component parameters and properties we know still less than about polar ones. However it is possible to get data that are necessary in order to ground and evaluate p-waves parameters.

Gas amer componenet density and of compression waves propagation velocity in gas are necessary data. From equality of cosmic gas components temperatures:

$$T_A = T_P$$

and under the condition that correlation for ideal gas can be used, it follows:

$$m_p C^2 / 2 \geq kT_p, \qquad T_p \cong 10^{-33} \text{ K}. \qquad (2.22)$$

2.14 Cosmic gas amer componenet is medium of interaction between polars and internal interaction between polar charges, so:

$$m_A << m_p, \quad n_A >> n_p.$$

Then from $m_A v_A^2 / 2 = kT_A$, we get

$$V_A >> (2kT_A / m_p)^{1/2} = C.$$

From cosideration amers interacrion dynamics we can make evaluations and determine:

$$V_{A(compr)} = V_{A(sound)} \approx 10^{60} \text{ m / s.} \qquad (2.23)$$

3. Ether polarization waves.

3.1. The mechanism of excitation and propagation of ether P-waves is as follows:

from the foregoing, the polars - are dipole structures and can be excited at eigenfrequencies. The dipol oscillations in polars through excitation of amer gas compression waves (amer ,,sound'' waves) in their turn excite oscillations of neighbouring polars. The energy transfer from one polar to another takes place - ether polarization waves.

3.2. Heat velocities of polars as particles with electric charges cannot be higher than velocity of light but heat velocities of amers are much higher than the light velocity.

So, when analysing the mechanism of P-waves excitation and propagation, the polars can considered at rest relative to amer gas.

P-waves propagation velocities are determined by the polar dipoles inertia (the propagation time of the coupling field between the polars is much smaller then the time constant of the polar dipole). So, without losses in final results, the distance between polars can be considered to be the same, equal to their mean free path length.

Then, to examine the P-waves mechanism, we can use a chain of coupled circuits as a model (Fig. 3.1)

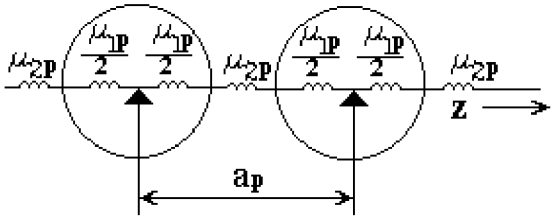

Fig. 3.1. The model of ether medium, where P-waves propagate.

P-waves equation corresponding to this model is:

$$m_{p(ch)}\ddot{q}_n = -\mu_{1p}[q_n + k_c(q_{n-1} + q_{n+1})], \qquad (3.1)$$

q_n – dipole arm of n-th polar,

$\mu_{1p} = \frac{4}{\pi\varepsilon_p}\cdot\frac{Q_{po}^2}{d_p^3}$, (look (2.5)),

$m_{p(ch)}$ – masses of the polar dipole charges,

$k_c = \mu_{2p}/\mu_{1p}$.

3.3. Using the continual description of waves propagation in the chain, with the wave length $\lambda >> a_p$, we get:

$$q_{n-1} + q_{n+1} \Rightarrow a_p^2\frac{\partial^2}{\partial t^2}q(z) + 2q(z).$$

Then eq (3.1) will be re-arranged to the form :

$$(\frac{\partial^2}{\partial z^2} - \frac{1}{V_{et}^2}\cdot\frac{\partial^2}{\partial t^2} - \mu_o^2)q(z,t) = 0, \qquad (3.2)$$

$$V_{et}^2 = a_p^2\omega_{po}^2 k_c, \quad \mu_o^2 = 1/(a_p^2 k_c).$$

3.4. The solution of the eq (3.2) are running waves with the dispersion law:

$$\omega_k^2 = V_{et}^2(\mu_o^2 + k^2), \qquad (3.3)$$

$k = 2\pi m/(a_p N)$,

N - number of atoms in the chain.

The running waves group and phase velocities are:

$$V_{g_k} = V_{et}k/(\mu_o^2 + k^2)^{1/2}, \qquad (3.4)$$

$$V_{f_k} = V_{et}^2/V_{g_k}. \qquad (3.5)$$

3.5. The results of quantitative estimates are:

Ether P-waves frequencies:

$$\omega_k \cong \omega_{po} \approx 10^{40}\ \text{rad/s}. \qquad (3.6)$$

Group velocities of ether P-waves include several components with the values multiple of their minimum value

$$V_{g(min)} \cong V_{eth(min)} \cong V_{et} \cong a_p\omega_{po} \cong 10^{20}\ \text{m/s}$$

(for the plane waves $k_c \le 1$).

The fact is that every polar is coupled not only with the nearest polars but also with the remote neighbours. That is why the maximum P-waves group velocity in vacuum is:

$$V_{eth(max)} \cong N \cdot a_p w_{po} \quad .$$

N - is determined by amer «sound» waves attenuation,

$$10^{20}\ m/s \le V_{eth} \le N \cdot 10^{20}\ m/s. \qquad (3.7)$$

3.6. Along with P-waves, whose velocities are defined by the relation (3.7), ,,slower'' components of P-waves are excited, where the electromagnetic waves are the coupling waves.

For ,,slow'' waves a transit time between neighboring polars is:

$$\Delta t = \frac{a_p}{C} + \frac{a_p}{V_{eth}}.$$

Accordingly

$$V^{sl}_{g.eth} = V_{eth.sl} = C/(1+C/V_{eth}). \qquad (3.8)$$

Since $V_{eth} >> C$, then $V^{sl}_{g.eth} = V_{eth..sl} \approx C$

Let's call them the «slow» components and components whose velocities are determined by relation (3.7) - the ,,fast'' ones and denote:

$$V_{eth} = V_{eth..f} \cdot \qquad (3.9)$$

It should be noted that the fields of the fast components have longtitudinal polarization of their electric component, and the slow components have cross polarization.

4. Discussion of the obtained results and conclusions.

4.1.The question about ether as material media existence is solved positively. It with necessity results from electromagnetic waves forming mechanism, wich is described by Maxwells equations. There is no basis for doubts that Maxwells equations with adecuacy describe EMW forming mechanism. The confirmation - one hundred years of experience of Maxwell's equation using..

4.2 The ether structure is natural consequence from conclusion about ether materiality and electromagnetic field formation mechanism. Ether - is, as minimum, two-component material media.

The particles of most coarse ether component - polars - are electrically polarized. Polars polarizability leads to existence of another more fine ether structure unit –amer. Experimentally observed phenomenon of «vacuum polarizability» and Lamb's shift give us possibility to evaluate these particles parameters.

4.3 Polarization waves existance is, as in principle as in practical terms, very important consequence of ether materiality and its electric polarizability. P-waves have of principle new properties.

The fact is that P-waves group velocity is essentially higher than the light velocity, just as grounded on the theory of relativity natural science paradigm restricts any propagation velocities by velocity of light. Usually this question was first in discussions, that were opened by articles [1].

Paradox is in fact, that restricton velocity is imposed only on charged particles [4] (atom consist of charged particles), just as polarization waves velocity is limited by velocities of neutral particles (amers).

Moreover, the theory of relativity is based on the assumption of only single energy-and-informaton carrier existence - electromagnetic waves (light). Since new energy-and-informaton carrier - polarization waves - has been discoveried, what shall we do woth postulates of the theory of relativity ? It is nesessary not only to develop the theory of relativity, but to determine the relativity theory conception itself.

4.4 The discovery of electromagnetic waves nature is principle: EMW are not independent, self-sufficient substance, but they are one of ether disturbance forms.

By that electromagnetic waves excitation without obligation is accomponied by polarization waves radiation.

In this context the effect of Kozyrev N.A. [5,6] should be considered: the stars are visible at two angels simultaneously and when the telescope aperture being closed with metallic sheet. Stars

radiate both electromagnetic and polarization (slow and fast) waves. The radiation of one type is accompanied by the radiation of another type without fail.

4.5 Great interest to P-waves practice using is based on their large propagation velocity, high carrier frequency and small attenuation. These properties give possibility to create on the basis of P-waves systems for far space communication and telecontrol.

As so as polarization waves discovering is based on 100 years of experience of electromagnetic waves using, P-waves existence does not require additional experimental check.

4.6 P-waves as psychophysical information carriers need special examination.

References: 1. *Колпаков Н.Д.* Поляризационные волны. //Радиотехника. - Вып. 101, - Харьков. - 1997. - С..53-62; Поляризационные волны - новый энергоинформационный носитель. // Радиоэлектроника и информатика,- № 1,- Харьков.-1997. 2.*Ацюковский В.А*. Общая эфиродинамика. М.: Энергоиздат.-1990.- 259с. 3. *Пьёркен Дж.Д., Дрелл С.А*. Релятивистская теория. Т.1. -М.: Наука. - 1978. -161 с. 4. *Эйнштейн А*. К электродинамике движущихся тел. Собрание научных трудов.- Т..1.- М.: Мир.- 1965.- С..8 - 36. 5. *Козырев Н.А., Насонов В.В*. О некоторых свойствах времени, обнаруженных посредством астрономических наблюдений.// Проявление космических факторов на Земле и звездах. М.: Изд-во Всесоюзного геодезического общества АН СССР.- 1980.- Вып. 14.- 188 с. 6. *Лаврентьев М.М.,Евганова Н.А.,Луцет М.К.,Фоминых С.Ф*. О дистанционном воздействии звезд на резистор.// ДАН СССР. -1990.- Т..314.- Вып. 2. - С. 352-355.

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