Physical model of vacuum and its elementary excitation - photon

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It is assumed that the vacuum is consistent by dynamides, streamlined in a tight crystalline lattice. Every dynamide is a neutral pair of massless point-like (PntLk) opposite elementary electric charges (ElmElcChrgs): electrino (-) and positrino (+). In an equilibrium position the contrary PntLk ElmElcChrgs in every dynamide are installed very close one to another and therefore its aggregate electric field (ElcFld) of every dynamide has zero electric intensity (ElcInt). However absence of a mass in rest of an electrino and positrino make it possible to have a big mobility and infinitesimal inertness of its own QntElcFld, what permits them be found a big time in an unequilibrium distorted position. The aggregate ElcFld of dynamide reminds us the QntElcFld of electric quasi-dipole as both opportunity massless electrino and positrino have the same inertness. For a certain that is why the vacuum do not radiate real photon (RlPhtn) by itself, as dynamide electric dipole moment has zero value. The aggregate ElcFld of every dynamide polarizes nearest neighbor dynamides in an account of which nearest dynamides interact between itself, because of which its elementary excitations have a wave character. It is richly clear that the motions of both opposite PntLk ElmElcChrgs of every dynamide creates an aggregate magnetic field (MgnFld) of every one and the sum of which makes a magnetic part of free QntElcMgnFld. The distortion of both PntLk opportunity ElmElcChrgs of every dynamide in the vacuum crystalline lattice creates its own polarization, the sum of which creates total polarization, which causes a total QntElcFld. Consequently the total polarization of all dynamides creates own ElcFld, which is an electric part of free QntElcMgnFld. Really, if the deviation of every PntLk ElmElcChrg from its equilibrium positions is described by dint of a collective oscillations (RlPhtns) formula of connected oscillators $u_j(r)$ then if we multiply the deviation u_j of every PntLk ElmElcChrg in every dynamide with the twofold ElmElcChrg value e and dynamide density $W = \frac{1}{\Omega_o}$, then we could obtain in a result the total polarization value of the vacuum $P_j(r)$

Further we must note that the change of the spring with an elasticity χ between the MicrPrt and its equilibrium position, oscillating with a circular frequency ω by two springs with an elasticity $\tilde{\chi}$ between two MicrPrts, having opportunity ElmElcChrgs and oscillating with a circular frequency $\tilde{\omega}$ within one dynamide, is accompanied by a relation $2\tilde{\chi} \simeq \chi$. Indeed, if the "masses" of the oscillating as unharmed dynamide is twice the ,,mass" of the electrino or positrino, but the elasticity of the spring between every two neighbor dynamides of is fourfold more the elasticity of the spring between two the MicrPrts ,having opportunity ElmElcChrgs and oscillating one relatively other within one dynamide, while the common "mass" of two the MicrPrts ,having opportunity ElmElcChrgs and oscillating one relatively other within one dynamide is half the ,,mass"of the electrino or positrino. Therefore the circular frequency ω of the collective oscillations has well known relation with the Qoulomb potential of the electric

interaction between two opportunity massless PntLk ElmElcChrgs electrino and positrino and their "masses" $\Theta\omega^2 = \frac{4e^2}{4\pi\Omega_o\varepsilon_o}$ $\Theta C^2 = \frac{e^2}{4\pi\Omega_o q^2,\varepsilon_o}$, where Θ is an inertial mass of electrino and positrino. If $N\Omega_o = \Omega$ and $d = WeE$ or $E = \frac{d}{\Omega_o\varepsilon_o} = \frac{P}{\varepsilon_o}$ then we could obtain an expression for the ElcInt $E_j(r)$ of the QntElcMgnFld, well known from classical electrodynamics (ClsElcDnm). Further by dint of the known defining equality $E_j = -\frac{\partial A_j}{\partial t}$ we could obtain the expression for the vector-potential A of the QntElcMgnFld in the vacuum. In end by dint of the kown defining equality $H = rotA$ we could obtain an expression for the MgnInt of QntElcMgnFld $H_j(r)$ well known from ClsElcDnm.

It turns out that the interaction between currents of the electrino and positrino, which is parallel to the vector of polarization I_{jq}, with the QntMgnFld H_j of the free QntElcMgnFld determines the motion velocity of generated free QntElcMgnFld. Therefore by dint of defining equations we can obtain: $\frac{1}{\sqrt{\varepsilon\varepsilon_o}} = v\sqrt{\mu\mu_o}$ or at $\frac{1}{\sqrt{\varepsilon_o\mu_o}} = C$, we have $C = v\sqrt{\varepsilon\mu}$.

By means of the upper scientific investigation we understand that the creation of the QntMgnFld together with the QntElcFld as two components of the free QntElcMgnFld one secures its motion. Therefore we may write the momentum of the free QntElcMgnFld by means of the equation of Pointing/Umov, using the definition equations:$P = \frac{[E\times H]}{4\pi C^2}$. It is necessary to remember that the light radiation of the moving PntLk ElmElcChrg causes a Lorentz' friction. Therefore at description of the forced oscillation PntLk ElmElcChrg it is necessary to take into an account the term of Lorentz' friction because of radiation. This consideration permits us to avoid as a divergence of the expansion coefficients of an electron wave function Ψ_j , connecting both energy levels, so and its dumping and increase in a time during its radiation. In such a way we can understand why RlPhtn has solitary needle fashion and one is radiated in single one past another.

The reception of known expressions for the ElcInt and MgnInt values of the QntElcMgnFld by dint of a simple transformation of an expression, describing deviation of two PntLk ElmElcChrgs of distorted dynamides proves obviously and scientifically the truth of our assumption about the structure of the vacuum and about the creation way of its collective oscillation - RlPhtn. The existence of a possibility for creation of virtual photons (VrtPhtns) as a excitation in the fluctuating vacuum renders an essential influence over the motion of a electric charged or magnetized MicrPrts by means of its QntElcMgnFld. The existence of free energy in a form of MicrPrt can break of the connection between pair contrary PntLk ElmElcChrgs of one dynamide and to excite pair of two opposite charged MicrPrts at once.

As all MicrPrts are excitement of the vacuum then all of them will move freely through it without any friction or damping, that is to say without to feel the existence of the vacuum. Moreover, the existence of some MicrPrt in the vacuum twists its cristalline lattice.This twist of the neutral vacuum excites the gravitation field of the MicrPrt's mass, which will influence by using of some force upon mass of another MicrPrt and upon its behaviour.