On the Neutrino Theory of Light

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Abstract: This is a review article. We show that the mass of neutrinos in accelerating fields behaves radically differently than masses other particles. Abandonment of the idea that photons are systems of entangled neutrino-antineutrino (NAN) pairs creates great problems today in a coherent description of dark matter, dark energy, nuclear plasma and spin and mass of the proton. In fact, objects built from entangled or/and confined NAN pairs create the illusion of the existence of quarks. Here we calculated the neutrino charge and the lower and upper limits for photon mass.

1. Introduction

An idea of the photon as a composite particle formed of a neutrino-antineutrino pair appeared in the 1930s [1], and so on. In the Standard Model, the photon and gluon are the elementary particles, the gauge bosons. It causes that the neutrino theory of light is not currently accepted. But the Scale-Symmetric Theory (SST) shows that abandonment of the idea that photons are systems of entangled neutrino-antineutrino pairs creates great problems today in a coherent description of dark matter, dark energy, nuclear plasma and spin and mass of the proton. In fact, dark energy consists of free non-rotating-spin neutrino-antineutrino (NAN) pairs (the free NAN pairs interact only gravitationally) while dark-matter objects are the structures built of the entangled non-rotating-spin NAN pairs (arrangement of the spins of NAN pairs excludes their rotation which is characteristic for photons and gluons) [2]. On the other hand, objects built from entangled or/and confined neutrino-antineutrino pairs create the illusion that hadrons consist of quarks [3].

Internal structure of neutrinos is described in SST [3]. SST shows that neutrinos and antineutrinos are different particles so they are the Dirac particles. Moreover, the tremendous non-gravitating energy which is frozen inside the neutrinos causes that they are the very stable objects so annihilation of the NAN pairs is impossible. Speed of free NAN pairs inside the Cosmos with stable boundary (it is about 10,000 times bigger than the present size of the expanding Universe) is equal to the speed of light in "vacuum" c. Due to the short-distance quantum entanglement (quantum entanglement is superluminal), the neutrino and antineutrino in a NAN pair are in strictly determined distance. On the other hand, due to the long-distance quantum entanglement (the long distances can change) a photon consists of one or more the NAN pairs.

Speed of an entangled photon is c in relation to an object with which the photon is entangled.

Neutrinos (so also photons) have mass. It leads to conclusion that in gravitational fields, photons should be accelerated. But it is impossible because the quantum entanglement dominates so speed of a photon can change only because of an interaction that changes object with which the photon is entangled. It forces rotation of the NAN pairs a photon (or gluon) consists of – such photon can be transversely polarized so Pryce's criticism is out of date [4]. The same concerns the Fock remark that not interacting neutrino and antineutrino in a photon cannot be emitted in exactly the same direction – just motions of the components of NAN pairs, due to the short-distance quantum entanglement, are correlated.

2. Neutrino mass

In [3], [5] and [6] we described how neutrinos and other particles acquire their mass – there are three different mechanisms concerning the SST Higgs field, the quantum entanglement and the Neutrino Quantum Gravity (NQG) which leads to the volumetric confinement.

For example, accelerated proton, which is built of the NAN pairs (their resultant speed must be invariant), tries to slow down the spin speed of its torus/electric-charge [3] – but spin must be conserved so the torus captures the NAN pairs from the Einstein spacetime. Just the relativistic mass of proton is the real physical quantity.

Neutrinos behave differently because there is no spacetime made of objects the neutrinos are built of. Speed of entangled neutrino (or NAN pair) is constant but rotation of its spin can change. When angular momentum of neutrino (or NAN pair) increases then dynamic pressure in the Einstein spacetime around it decreases so mass density of the spacetime near the neutrino (or NON pair) increases – it leads to an illusion that mass and effective radius of neutrino (or NAN pair) increases. In [3], we calculated masses of the non-rotating neutrinos while in [7], we calculated the illusory masses of the cosmological neutrinos.

3. Nuclear plasma

According to SST, nuclear plasma at very high energy is built of the very stable cores of baryons (they are very stable because of the short-distance quantum entanglement) packed to maximum. On the other hand, at very high energy, in the Standard Model appears the asymptotic freedom for the point-like quarks so at very high energy nuclear plasma should be squeezed to mathematical point – it is inconsistent with observational and experimental data.

4. Limits for photon and gluon mass

According to SST, due to the four-object symmetry [2], a photon (or gluon) consists of one NAN pair up to 4^{32} NAN pairs. It leads to the lower and upper limits for zero-rotational-energy photon/gluon (photon in the strong field behaves as gluon [3])

$$6.7 \cdot 10^{-67} \text{ kg} \leq M_{\text{Photon/Gluon}} \leq 1.2 \cdot 10^{-47} \text{ kg}. \tag{1}$$

5. Neutrino charge

According to SST, electric charge of proton or electron consists of $3.9 \cdot 10^{39}$ neutrinos. It leads to the weak charge of neutrinos equal to

$$e_{\text{Weak,neutrino}} = 2.6 \cdot 10^{-40} \text{ [electron charge]}. \tag{2}$$

The experimental result is $e_{\text{Weak,neutrino}} < 2 \cdot 10^{-15}$ [electron charge] [8].

References

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