The reasons for the deceleration of photons in matter from the standpoint of the theory of the Elastic Universe. Hypothesis.

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Abstract. The reasons for the slowing down of light in matter are stated from the standpoint of the theory of the Elastic Universe.

Lina House's experiments on slowing light in Bose-Einstein Condensates (BEC) sodium at low temperatures raised a lot of questions. The main question is: what is the reason for such a large slowdown of light (by a factor of millions) in sodium condensate at low temperatures in the Bose-Einstein state? The search for an answer to the question leads to a fundamental question: why does light slow down at all when passing through matter?

Traditionally, the slowing down of light is interpreted as collisions of photons-particles with atoms of matter. From the point of view of the theory of the elastic universe, elementary particles are axisymmetric wave vortices in Gukuum (elastic continuum). Purely wave formations without any transfer of matter. Photons are not wave vortices, but are elastic deformations of Gukuum, which, according to the solutions of the wave equation, are sometimes formed in pairs, and propagate while maintaining their shape, at the speed of light, in opposite directions. Allegedly, the wave properties of photons are determined by their standard shape of a sinusoid or spring, which is determined by the process of photon production. The legend about "entangled" photons is apparently generated by the pairing of photons.

The creation of photons occurs in many processes. Either it is a transition of an electron in an atom to a lower energy level. Or it is the process of annihilation of two particles colliding "head-on". Or just in particle collisions. In both cases, due to the wave rotation of the electron shells, a waveform of photons is formed in the form of a sinusoid or in the form of a spring. Which then flies at the speed of light. And because of its shape, when it collides with matter, it exhibits wave properties.

However, why do photons slow down when passing through transparent substances? First, where do transparent substances come from? Which substances are transparent and which are not? Nontransparent substances are substances in which there are quantum energy levels equal to the energy of a passing photon. For example, in metals there are many free electrons, which have millions of energy levels, and such substances are capable of absorbing almost any photons. Transparent substances are substances in which there are no energy levels equal to the energy of the passing photons.

Why are passing photons slowing down in substances? From the standpoint of the theory of the elastic universe, the picture of the slowing down of photons in matter looks like this. A photon is a deformation of the Gukuum that moves at the speed of light. Atoms of matter are wave vortices in which the wave runs in a circle around the axis. Mathematical solutions for wave vortices are found and given in the theory of the Elastic Universe. In these wave vortices, there is a predominance of one (of the two) directions of rotation, which is why the spin and charge of the particles arise. The following is a simplified picture. When colliding with a photon, one half of the elementary particle rotates in the same direction in which the photon moves. And this half does not slow down the photon. But the second half rotates in the opposite direction to the movement of the photon, and this half slows down the photon. As a result, after summation over all particles of matter, the resulting deceleration of the photon is created. This is the reason for the slowing down of the photon. After leaving the substance, the photon again moves with the speed of light, because the speed of the photon is determined by the elastic properties of Gukuum.

In a gas, molecules are rare and the deceleration of a photon is very weak. In matter, the deceleration of a photon is stronger. But due to the relatively large distances between the atoms

of matter in crystals, the deceleration of photons in matter is very limited by a few percent of the speed of light.

Where does such a huge slowing down of photons in Bose-Einstein Condensates (BEC) come from? It seems that the reason for such a slowdown is that in BEC all atoms are aligned in the same way, freeze, and slow down the light together, together, everything is the same. Moreover, a passing photon cannot change their orientation. All atoms and nuclei are frozen in one state. And in transparent substances at ordinary temperatures there is a distribution of atoms according to the orientation of the spins, and the passing photon is able to change the orientation of the spins of the atoms of the substance.

Thus, I think, if Lena House's experiments are carried out with different orientations of spins in the BEC, with different polarizations of transmitted photons, then a spread in the magnitude of the slowing down of photons can be observed. Up to a complete lack of deceleration. And also all kinds of variations of the effect of the polarization of the photon on the slowing down.

This is a preliminary picture of the slowing down of photons in sodium BEC.

References.

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