Klinkerman R.V.

Information exchange by means of separate complex photons

In this paper we try to motivate the possibility of information transmission by means of individual complex photons. The characteristic features of the transfer, in particular, its large penetration and weak determination are considered. Assumptions are made about the approaches to experimental verification of the phenomenon

Key words: photon, angular momentum, projection of the momentum, the wave function, information, quantum, spectrum.

The usual exchange of information through an electromagnetic field is produced using:

• sufficiently strong signals as a stream of numerous photons,

• the most simple dipole radiation.

The question arises: is it possible to transmit information by generating complex photons that carry information inside? But the literature shows only a theory of multipole photons radiation with the assumption that the photon wavelength is much larger than the size of the radiating system [1, 2].

It covers the following types of photons.

Photon in a state with angular momentum j and parity $(-1)^j$ is called 2^j-pole photon of electric type. For example, for j = 1 it is the dipole photon, for j = 2 quadrupole, for j = 3 oktopole, etc. When parity $(-1)^{j+1}$, the photon is 2^j-pole magnetic type.

If we write:

a - the size of the emitting system,

λ - wavelength,

then the probability of photon emission is roughly proportional $\left(\frac{a}{l}\right)^{2j}$.

Thus, with increasing j by 1 emission probability decreases in $\left(\frac{a}{l}\right)^2$ times.

More precisely, the probability of radiation depends on the projection of momentum M on any axis of the coordinate system, for example, Z.
In respect of such radiation an interesting paradox raises, referring generally to the quantum theory. The fact that the photon has a specific angular momentum and its projection, is reflected in the angular structure of its wave function as it propagates through space. For example, a photon with j = 1, and the absolute value of the projection | M | = 0 has a spatial structure

$$-\frac{3}{8p}(\cos^2 q - 1),$$

where q - the angle between the Z axis and the direction of propagation of the wave.
Photon with j = 2 and | M | = 1 has the structure

$$\frac{5}{16p}(4\cos^4 q - 3\cos^2 q + 1) \quad \text{etc.}$$

Thus photon inflates in the speed of light with different weights in different rays. But when it meets the material object far away from the source and the wave function collapses in the spirit of von Neumann, will the photon impact on the object have its L and M, i.e. the same characteristic that it received when it was radiate? If, for example, a photon was quadrupole, whether its impact on the remote object will quadrupole?

The answer to this question is yes, because of the law of conservation of angular momentum and energy. When an atom absorb a photon in their interaction it will be sum L, M, energy of the photon and the atom. If the photon is scattered by an atom the sum of the initial photon and atom j is equal to a finite sum. Also it is in respect of M and energy. Of course, the addition is carried out by quantum-mechanical rules. [4]

It is known that the emitters of multipole γ-photons are nucleuses formed after α- or β-decay in the excited state [3]. It is firmly established that in experimental investigation of γ- the radiation one can determine a nuclear parity and spin. Thus, in the detection of a photon become known the characteristics obtained during radiation. Transmission of information takes place.

One must also bear in mind that the impact of the photon to an object does not depend on the distance between the source and the object; on this distance depends only the probability of a photon hitting an object (the inverse square of the distance).

To reflect the structure of a complex system with a photon there should be $\lambda \ll a$. If we formally use the above estimates, the probability of radiation should be very large. Since in practice this is not observed, it is clear that this theory is unsound. But there is no reason to assume that this radiation does not exist

Since with $a \gg \lambda$ one emitted photon covers a lengthy and complex structure of the radiator, apparently in order to radiate that photon the whole structure must have one wave function, or at least a density matrix that it is close to the square itself. This occurs in discussed above a condition $a \ll \lambda$, but now photons is not monochromatic, they contains harmonic spectrum - according to the complexity of the radiator.

What must be the receiver of the radiation? Apparently, it must have a structure similar to the structure of the radiator, and also to be covered by a single wave function. Therefore, the emitted photon will pass easily through the material until it hits a suitable structure and extensive wave function. In accordance with the idea that a photon is a particle, it is expected that it will transmit the complex structure of the radiator to the receiver.

These terms and conditions for emission and perception of a complex photon most naturally are realized in living organisms, with the central nervous system, as just such a system realize the unity of the body and, therefore, the wave functions that cover large areas. For experimentation on non-living objects the most suitable conditions appear in the cryogenic area, close to absolute 0 - it can be expected that matter will be covered with single wave function. For radiation start it may be needed a quick warm-up.

A characteristic feature of the outlined information exchange is its weak predictability. Emission and reception of information shall be at the quantum level, but at this level you can only predict the probability of the event, but not the event itself. That is why the phenomenon of telepathy not respond or almost not respond to the will of man.

And whether this phenomenon is the fact? In the literature you can find plenty of evidence. The author himself had an experience that can not be explained by something else.

References:

1. A.I. Achhieser, V.B. Berestetskiy. Kvantovaya elektrodinamika, 2-e izdanie, Moskva, 1959.
2. V.B. Berestetskiy, E.M. Lifshits, L.P. Pitaevskiy. Kvantovaya elektrodinamika, 2-e izdanie, Moskva "Nauka", 1980.
3. K.N. Muchhin. Vvedenie v jadernuju fiziku, GOSATOMIZDAT, Moskva, 1963.
4. L.D. Landau, E.M. Lifshits. Kvantovaya mechhanika, 2-e izdanie, Moskva, 1963.