Interrupt signal Great Silence.

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The algorithm for calculating the observation rotary B-mode CMB based on quantum entanglement provides the ability to instantly transmit information.

Paradox "Great Silence of the Universe" is formulated as a contradiction between the ideas of widespread intelligent life in the universe, and the lack of information exchange between extraterrestrial civilizations.

Notable projects searches for extraterrestrial intelligence, symptoms and signs of activity extraterrestrial civilizations, such as SETI, SETI @ Home, METI, WikiSky, orbital Hubble space telescope, Wise, and other projects focused search, including parcel or reception of signals, mostly in the radio. There are proposals to test and the optical range, including lasers, and gravitational waves.

Clearly, however, attempts to establish an exchange of information on astronomical distances limited speed of light is counterproductive and is located on the periphery of scientific thought.

Alas, the idea of the possibility of superluminal motion is no less marginal in the eyes of modern physics, but allows for the existence of objects moving at arbitrarily high speeds, but do not carry information (rotating beam spot light source, the phase velocity, etc.). At the same time, it is obvious that significant contact of civilizations makes sense only if superluminal speed, and in the limit where is the instantaneous transmission of information.

Previously [1,2] we proposed a thought experiment that allowed formulate logic explanations of instant and receive information on a single quantum channel.

The logic circuit is based on a generalization of several phenomena into one event. The phenomenon of entanglement, non-local spin correlation quants projected on correlation direction of the momentum, then the representation is projected in the direction of the field vectors on the surface of the wave front. As a result, the model of instantaneous pulse summation of all points in the detector, and offer to return to power, and not the probabilistic interpretation of the collapse. This mechanism allows instantaneous quantum communication quantum exists as a unit and move in space in the form of the wave front with no breaks and folds.

Fundamentally important in these models is a diagram (Figure 1) illustrates the transformation of the wave front moving in space with velocity $V = C$ along the vertical axis, acting on the quantum, which moves along the horizontal axis, and the resulting momentum p, which is measured in the detection of quantum.

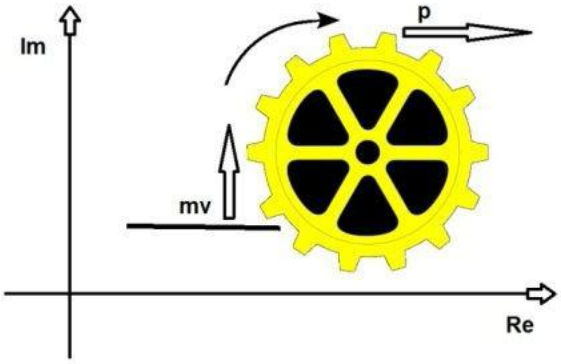


Fig. 1. Converting divergent *mv* and *p*, because the rotational motion of the quantum.

The momentum *p* is detected by the observer as a real boost caused by the imaginary mass *m*. Imaginary direction masses are more than Imaginary AC voltage or current in the inductor (*). Rejecting the mystical perception of imaginary mass, we can enter the superluminal particles [3] (in modern terminology, the tachyon) in the special theory of relativity (1) or to build a scalars, vectors, (2) or spinors (3) tachyon and develop a productive approach to the possibility superluminal communication.

$$\vec{p} = \frac{m\vec{v}}{\sqrt{1-\frac{v^2}{c^2}}} \tag{1}$$

$$\partial_x^2\psi + \partial_y^2\psi + \partial_z^2\psi - \frac{1}{c^2}\partial_t^2\psi - \frac{m^2c^2}{\hbar^2}\psi = 0, \tag{2}$$

$$\left(mc^2\alpha_0 + c\sum_{j=1}^{3}\alpha_j p_j\right)\psi = i\hbar\frac{\partial\psi}{\partial t}, \tag{3}$$

$$m = Im \Rightarrow v > c$$

Signs of a tachyon, such as, never be able to rest and have infinite speed in reference frame, shows a quantum system in Fig. 2, taken from [1].

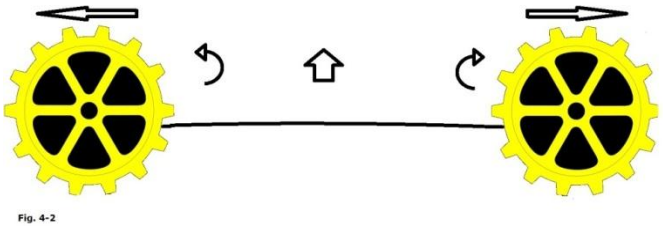


Fig. 2. The wave front of the cross moving at V = C, looks like a transcendent tachyon instantly stretching along the way distancing quantum velocity V = ∞.

Thus possible to speak about tachyons not as a particle, but a property of tachyons wave front surface interacting with entangled quants.

Virtual tachyon particle is a convenient formal technique for the quantum description of many physical phenomena and interactions of quants and fields. It is known that the fields have

the property of spontaneous symmetry breaking demonstrate and tachyons properties, but the effect of exceeding the speed of light is observed only in small distances and can not say whether there is an initial particle or a copy there of, materialized in the distance.

We can uninstall the virtual tachyon moving from one photon to another quantum speed $V=\infty$ by introducing a third object (the quantum field of the wave front), acting through the motion of quanta from each other and have an impact on both the quantum in the same time, we set the limit the impact of events on each other and maintain causality.

In the scheme considered the interval between events with quanta A and B space-like and can be of any length, and the intervals between events with quants A and B and C event (wave front has reached the two quants A and B, and not approaching them from a distance) - CA and CB are timelike and equal to 0.

Theorem on the prohibition of cloning prevents the transmission of information about entanglements events A and B faster than light. However, the main purpose of cloning is to carry out cloning exactly, but not fast. Reasoning theorem on the prohibition of cloning come to the result $\langle\varphi|\psi\rangle = \langle\varphi|\psi\rangle^2$. Consequently, the or $|\varphi\rangle=|\psi\rangle$, or the state $|\varphi\rangle$ and $|\psi\rangle$ are orthogonal. Thus, in general, arbitrary quantum state can not be cloned. In this sense, the theorem Prohibition of Cloning proved, but thus allows it to clone identical or orthogonal states, which are not the general case and are not arbitrary.

In the framework of the model (Fig. 2) we can say that the choice to transfer precisely these states used the EPR correlations characteristic intricate quanta, and for the transmission of classical information about the pulse - the usual channel, which in our case is the simultaneity of the third object. It's important evaluate not only the possibility of instantaneous transmission of information on the basis of measurement, but nature of the base without having to guess.

As an information basis we can consider the difference between the background and the signal with the traditional exchange signals from the background and the signal for instant transmission of information submitted by Fig. 3a and 3b.

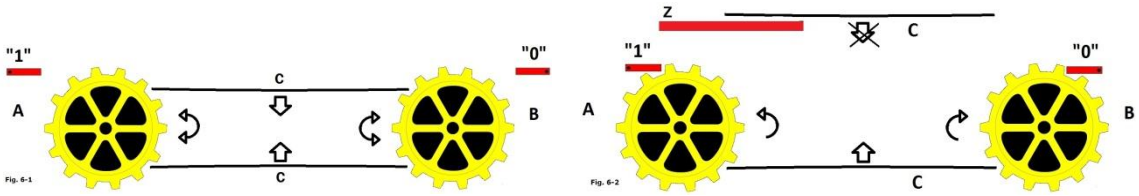


Fig.3a. Prior to the registration value spin/polarization is not defined, and in time registration at points A and B, on average recorded background intensity $I_f= (1+1) / 2 = 1$.

3b. At points A and B, the average registered rate = (1 +0) / 2 = 0.5, which is a signal for enforcing absorber Z. On the upper front collapses on the absorber Z and has no action on A and B.

It is important that the signal decoherence entanglement below the background level of entanglement, and, essentially, the voids in the noise. If a normal signal transmitted at v = c, signal above the noise Is> If, then signal entanglement $v = \infty$ and Is <If. It is this ratio occurs when an unauthorized intrusion into a point C in quantum communication line between points A and B, or noise with decoherent system qubits in the derivation of the decision in a quantum

computer. Distortion of information in the communication or lack of decision is a sign of entanglement.

Known physical phenomena have a close value of the signal / background can be identified observing rotary B-modes of cosmic microwave background radiation CMB. Registration B-mode is characterized by the unknown noise level for this component of background radiation, which may be equivalent to the maximum amplitude of the observed B-mode (0.1 mK) and serves as a background of entanglement, and the maximum signal in the complete absence of the B-mode.

B-mode at the limit of sensitivity of instruments is determined density of gravitational waves and gravitational lensing is mixed with a strong E-mode, in addition, the whole "noise" in the data has unusual spatial and temporal correlations, and their needs to be subtracted to reveal cosmological signal, the flow of data over time has a very low ratio "Signal-to-noise", unlike many other types of data, and the signal can be seen only averaging all of the data, in addition, in the sky there is "excess variance" in comparison with expected noise; detection result is a set of stained specimens; most of the methods used to deal with more traditional signals is useless [Douglas Scott dscottATastro.ubc.ca; 2005].

Such a non-trivial conditions of observation and of information processing require the development of a special type of background and signal for registration entanglement.

Prototypes of signal detection algorithms can provide entanglement results of the observation of non-local quantum correlations generated by spontaneous parametric scattering [4,5,6] in Fig. 4,5,6.

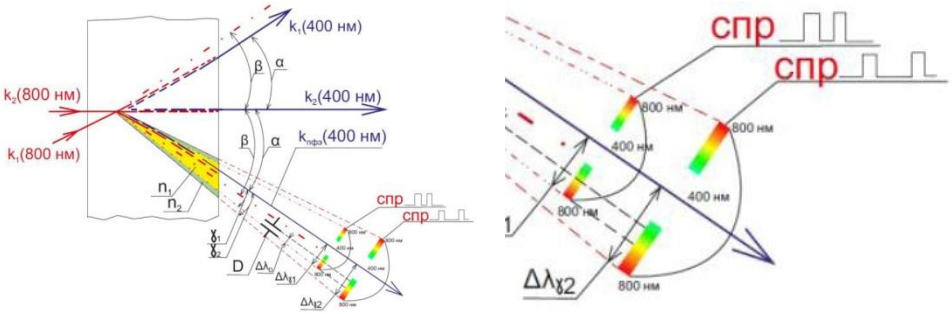


Fig.4. The experimental scheme and spectral representation of the signal pulse [4].

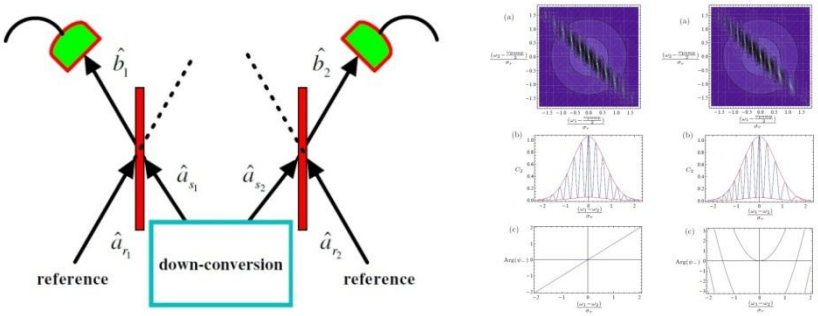


Fig.5. The experimental scheme and interference signal representation [5].

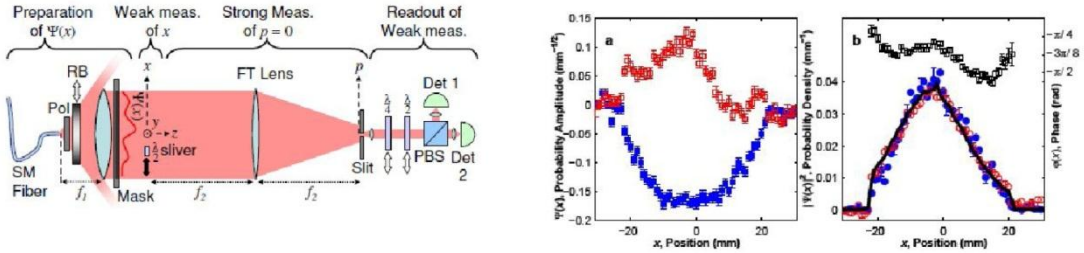


Fig.6. The scheme of the weak measurement and representation of the signal wave function single photon [6].

Scheme of the experiment [5] is very useful for the logical preparation (Fig. 7a and 7b) by the schemes of models [1,2]. At each point located on the surface of the wave front we see the interaction between the four parties, namely, the signal quant a_s and reference quant a_r interact in the quantum, creating an asymmetry, and the result of this interaction is either a signal in the form of a quantum *b*, or quantum, in the form of the induced field *B*, continues to spread in space. Quantum of creating asymmetry appears as a property of the nonlinear optical plate or quadrupole gravitational wave. Each of the participants in the interaction of equality, they can be interchanged, and consider, for example, the registration of CMB as a non-laboratory experiment on the detection of gravitational waves. The logic model will not change and if the individual quantum, reference and signal, represented as a single quantum mode. It is important that the change of location of the participant does not change the correlation between neighboring points. Correlation will persist for a different nature of quants involved in the interaction. [7]. Correlation persists as micro l (particle collisions, resonance, the transition of the potential barrier), and the macro L (l = 1 / L) (relic background, gravitational lensing).

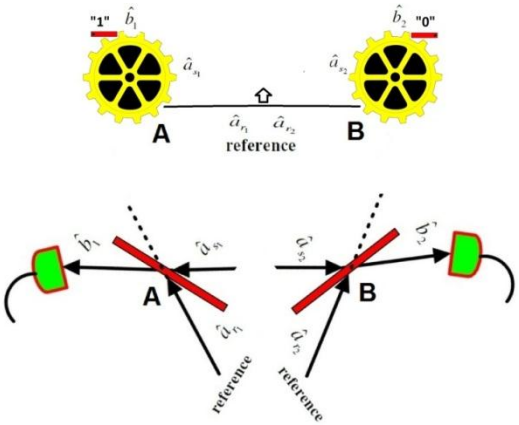
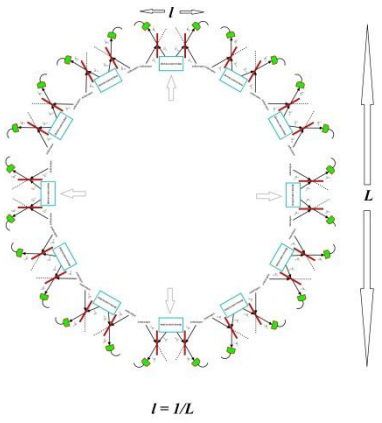


Fig.7. The interaction of the signal $\boldsymbol{a_s}$ and reference as photons a_r corresponds to the case when the wave front is the reference object of the scheme [1]. Distance AB can be a *l*, and *L*.



Ris.7b. The interaction of the signal $\boldsymbol{a_s}$ and reference as photons a_r equivalent induction field *B* at the points of the wave front propagation scheme for quantum *b* [2].

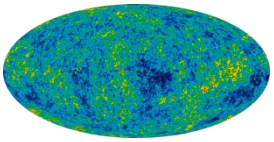
As for the distances L already exist values of the background / signal relic microwave radiation, it is important to assess the capacity information channel length L.

In the interaction of the relic microwave photon with "a grain of sand" in outer space, the wave function is decoherence in about 10^{-6} seconds, that is, every second detector registers about 10^6 microwave photons [8] has already reached the detector, and this value can be estimated as the capacity of the link. If the accumulation of signal statistics and need at least

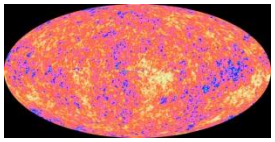
10^3 events, then that would suffice for the implementation of a superluminal telegraph or transmission of voice data.

The material of the screen absorber Z prospective use gradient films [4], in which the number, thickness, material layers, type, quantity and orientation of the microcrystals and the degree of their conductivity optimally configured resonance with the reference wave front, but not for the parametric conversion and for intensive absorption and internal reflection of microwave radiation. This composite meta-material combining conductor, semiconductor and insulator will form a highly effective coating of the absorber Z.

New signal processing algorithms tangled allow the registration B-mode CMB hear tangled sky, and the new absorbing meta-materials enable us to speak for themselves.



Signal hidden in dark areas.



Sky view after identifying signal.

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