

# Immediate (Timeless, Atemporal) Transfer of Energy and Information

Amrit Srečko Sorli

[sorli.bistra@gmail.com](mailto:sorli.bistra@gmail.com)

Scientific Research Centre BISTRA, Ptuj  
Slovenia

## Abstract

In quantum physics there are some experiments where speed of energy and information transfer seems to be faster than light speed. In order to overcome this puzzle, the option proposed here is that energy and information in these experiments are not carried by photon or other particles. Quantum space itself is the direct medium of energy and information and transfer. This solution gives an original interpretation of the Einstein-Podolski-Rosen experiment and of causality problems for Fermi's two-atom system. In both examples quantum space is a direct medium of energy and information transfer between particles A and B. Time of energy and information transfer between particle A and particle B is zero, speed is infinite.

**Key words:** time, space, information, energy transfer, light speed infinite speed

## Introduction

Information moves between "source" and "detector" that exist in space. With clocks we measure duration of signal motion from source to detector. Time is a measure of information motion, while the maximum speed of information motion is light speed. In cases where information and energy transfer between source and detector is immediate, we consider that quantum space itself is the direct information and energy transfer medium between source and detector.

## Einstein-Podolski-Rosen experiment

This experiment shows that two quanta A and B which have been together and then sent in space in opposite directions, "are aware" for each other in an instant moment. When the spin of particle A is unilaterally changed, an astounding experimental result is that the other (B) particle's spin "immediately" flips of its own accord. Furthermore, the means by which the information of the first spin flip is transferred to the second particle (so that it too can flip) is information which is required to travel faster than the speed of light. While the information transfer may not be simultaneous (limitations on

the experimental apparatus prohibit any proof of simultaneity), it nevertheless -- within the time frame of the Planck constant or speeds in excess of the speed of light -- must connect the two particles in some fundamental manner.

Here is considered that in the EPR experiment space is the direct information medium between elementary particles. There is no information signal in form of photon or some other particle traveling between particles A and B. The time of information transfer between particle A and particle B is zero (1).

Some other research also shows that quantum direct communication is a real phenomenon: We show how continuous-variable systems can allow the direct communication of messages with an acceptable degree of privacy. This is possible by combining a suitable phase-space encoding of the plain message with real-time checks of the quantum communication channel. The resulting protocol works properly when a small amount of noise affects the quantum channel. If this noise is non-tolerable, the protocol stops leaving a limited amount of information to a potential eavesdropper (2).

### **Causality problems for Fermi's two-atom system**

Space as the "direct information medium" resolves the causality problem of Fermi two atoms system: "Let  $A$  and  $B$  be two atoms or, more generally, a "source" and a "detector" separated by some distance  $R$ . At  $t=0$   $A$  is in an excited state,  $B$  in its ground state, and no photons are present. A theorem is proved that in contrast to Einstein causality and finite signal velocity the excitation probability of  $B$  is nonzero immediately after  $t=0$ . Implications are discussed (3).

Excitation probability of  $B$  is nonzero because the space in which atoms exist is the "direct medium of excitation". Excitation from atom  $A$  to atom  $B$  is direct and immediate via space and not indirect via particles which move in space from atom  $A$  to atom  $B$ .

### **Indirect and Direct Quantum Information and Quantum Energy Transfer**

In EPR and Fermi two atoms system space is the direct medium of information (I) and energy (E) transfers between elementary particles. According to quantum gravity, space is made out of quanta of space. Direct quantum information and direct quantum energy transfers run directly over quanta of space which have the size of Planck. Time (t) of direct quantum information transfer and direct energy transfer between particles is zero; velocity (v) is infinite.

The time (t) of indirect quantum information and indirect quantum energy transfers via photons or other particles which move in quantum space is more than zero; velocity (v) is of a light speed.

(I),(E)  $\xrightarrow{\text{transfer}} 10^{-35} \rightarrow t = 0, v = \infty$  immediate (atemporal) I,E transfer

(I),(E)  $\xrightarrow{\text{transfer}} \triangleright 10^{-35} \rightarrow t \triangleright 0, v = c$  temporal I,E transfer

## Quantum Gravity

In General Theory of Relativity 3 dimensional objects exist into a 4dimensional physical space that is mathematically described with the model of space-time. Gravity force is the result of curvature of 4 dimensional physical space. One can consider that gravity force as a result of curvature of space works directly into space itself and indirectly between material objects. More physical space is curved; more space has a tendency to shrink. This shrinking force pulls together 4 dimensional physical space and also 3 dimensional material objects that are existing into it. Considering that physical space could have granular structure one can see gravity force as a non-propagating force working directly between quanta of space.

Density of energy in a given volume of the universe is a sum of density of space energy, density of matter energy, density of electromagnetic energy and has tendency to be constant. Where density of matter is high, density of space is low and opposite. In the areas of low space density gravity forces between quanta of space are stronger, space is more curved. Where there is no matter density D of space is higher gravity forces between quanta of space are less strong. Density D of physical space in a centre of massive material object is  $D = 1/m$  where m is a mass of the object.

Attraction force F between two massive objects is:  $F = \frac{G}{m1 * m2 * r^2}$  where G is gravitational constant, D1 is density of space in a centre of first object, D2 is density of space in the centre of second object, r is a distance between two centre of material objects. Gravity force works into direction of decreasing of density D. In the centre of the Earth density D of space is stable, so gravity force there on a given object is zero. Also at the Lagrange point between Earth and Moon density D of space is stable and on the object there gravity force is zero. From the Lagrange point to the Earth density D of space is decreasing to the surface of the Earth, than it is increasing going inside the Earth and towards the centre decreasing again according to the formula  $D = 1/mT$ .

Density  $D$  of physical space at the point  $T$  from the centre of massive object is:  $D = 1/m_T$ , where  $m_T$  is the mass of the globe under the point  $T$ . The mass of the massive object above the point  $T$  does not influence density  $D$  inside the globe (according to the Newton Shell Theorem).

At the surface of the massive object density  $D$  is  $D = 1/m$ , where  $m$  is the mass of the object. In the centre of the massive object and on its surface is density  $D$  of space equal gravity force is different because of gradient of density that is in the centre stable and at the surface is getting lower by going to the centre.

Massive objects moving in space change immediately space density infinitely far away. In this sense all stellar objects in the universe are in a direct gravity connection. Transfer of gravity force is immediate for all massive objects that exist in the universe. So gravity force is a primary force of the universe, it connects universe in a whole.

### Superluminal Phenomena

According to understanding here physical phenomena where speed of information and energy transfer is higher than light speed exist.

Experiment from which they conclude that an electron can tunnel through the potential barrier of an He atom in practically no time was carried out recently (4).

It is considered here that electron can be understood as a packet of an energy transfer via quanta of space (that have a size of Planck) and so its speed is infinite. Time  $t$  of electron "jump" from one quanta of space to another is zero ( $t = 0$ ), because distance between two quanta of space is less than Planck distance. When we calculate sum of jumps on distance  $d$  time  $t$  is zero:  $t = 0 + 0 + 0 + 0 + 0 = 0$ . Speed  $v$  of electron transfer is infinite:  $t = 0, v = \infty$ .

### Test of Influence from Future in Large Hadron Collider

Some physicists discuss that particle in the future could influence present (4). When we understand time as a measure of motion this idea is acceptable: **if a phenomenon that exists in future can influence present this means that future already is existent.** Idea here is that time is only a measure of motion in space. Space itself is "beyond, out of time" but past, present and future exists in space. So past, present and future can influence each other in all possible ways. This means that division on past, present and future is not necessary. Universe is a block of "matter-energy(of the space)" where "before" and "after" do not exist physically, they are only models for explaining energy interactions. Universe runs in a timeless (atemporal) space where time is a measure of energy motion.

## Conclusions

Quantum information transfer and quantum energy transfer via particles have a light speed. Quantum information transfer and quantum energy transfer directly via quantum space are immediate. Time of transfer is zero, speed of transfer is infinite.

## References:

1. Fiscaletti D. Sorli A.S. Non-locality and the Symmetryzed Quantum Potential , Physics Essays, 21(4), (2008)
2. S. Pirandola and others, Quantum direct communication with continuous variables, A Letters Journal Exploring Frontier of Physics (2008)  
<http://www.iop.org/EJ/abstract/0295-5075/84/2/20013>
3. Gerhard C. Hegerfeldt. Causality problems for Fermi's two-atom system, Phys. Rev. Lett. 72, 596 - 599 (1994) [http://prola.aps.org/abstract/PRL/v72/i5/p596\\_1](http://prola.aps.org/abstract/PRL/v72/i5/p596_1)
4. P. Eckle, A. N. Pfeiffer, C. Cirelli, A. Staudte, R. Dörner, H. G. Muller, M. Büttiker, U. Keller, Attosecond Ionization and Tunneling Delay Time Measurements in Helium, Science, Vol. 322. no. 5907, pp. 1525 – 1529 (2008)  
<http://www.sciencemag.org/cgi/content/abstract/322/5907/1525>
5. Holger B. Nielsen, Masao Ninomiya, Test of Influence from Future in Large Hadron Collider; A Proposal, last revised 11 jul 2008 <http://arxiv.org/abs/0802.2991>