Indirect and Direct Quantum Information and Quantum Energy Transfer

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Abstract

Between quanta A and B on distance d in space we measure information transfer and energy transfer with clocks. Time is a measure of information and energy transfer. In quantum physics they are some experiments where speed of information motion and energy transfer seems to be faster than light speed. In order to overcome this puzzle an option is that information and energy does not move between particle A and B. Space itself is the direct information medium of information and energy between particle A and B. This solution gives an original interpretation of Einsten-Podolski-Rosen experiment and of causality problems for Fermi's two-atom system. In both examples space is the direct information medium between particles A and B. Where space is the direct information medium, there is no time needed for information and energy to be transferred from particle A to particle B.

Key words: time, space, information, motion

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. Maximum speed of information motion is a light speed. In cases where information between source and detector is immediate we consider that space itself is the direct information medium between source and detector.

Einstein-Podolski-Rosen experiment

This experiment shows that two quantum A and quantum B which have been together and then send in the space in opposite directions "know" 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 (limits on the experimental apparatus prohibits any proof of simultaneity), it nevertheless -- within the time frame of the Planck constant or speeds in excess of the speed of light -- must connects 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 a 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).

Causality problems for Fermi's two-atom system

Space as the "direct information medium" resolves the causality problem of Fermy 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 (2).

Excitation probability of B is nonzero because 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 and via particles that move in space from atom A to atom B.

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Space can be the direct medium of information (I) transfer and of energy (E) transfer between elementary particles. According quantum gravity space is made out of quanta of space. Direct quantum information transfer and direct quantum energy transfer run over quanta of space that have a size of Planck. Time of direct quantum information transfer and direct energy transfer between particles is zero. Time of indirect quantum information and indirect quantum energy transfer via photons or other particles that move in quantum space is more than zero.

$$(I),(E) \xrightarrow{transfer} (10^{-35m}) \rightarrow t = 0$$

$$(I),(E) \xrightarrow{transfer} (\triangleright\, 10^{-35m}) \rightarrow t \triangleright 0$$

It is considered here that also gravity energy transfer between elementary particles and massive bodies over quanta of space is direct and immediate. Gravity is generated by quantum structure of space. Quantum structure of space defines curvature of space and so gravity force. Time of energy transfer by gravity is zero.

Conclusions

Quantum information transfer and quantum energy transfer via particles have a light speed. Quantum information transfer and quantum energy transfer via quantum space are immediate.

References:

1. Fiscaletti D. Sorli A.S. Non-locality and the Symmetryzed Quantum Potential , Physics Essays, 21(4), (2008)

2. 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