Duality of Time from Quantum Entanglement

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Abstract: Experimentalists used an entangled state of two photons to show that time is going in different way for internal and external observers. Here, within the Scale-Symmetric Physics (S-SP), we show that such scenario concerns the elliptical states of electron in atoms. There are two different entangled circular states of an elliptical state and jumps of entanglon, responsible for quantum entanglement, between them. It causes that global energy is static whereas an internal observer associated with one of two entangled circular states (the clock) sees evolution of the other circular state. It is the duality of time from quantum entanglement. Similar mechanism concerns two mass states of proton and of neutron but there is exchanged electric charge between the very dense gluon fields. Such exchanges lead to the mean fractional charges of the dense gluon fields.

Here [1], we can read that "experimentalists used an entangled state of the polarization of two photons, one of which is used as a clock to gauge the evolution of the second: an "internal" observer that becomes correlated with the clock photon sees the other system evolve, while an "external" observer that only observes global properties of the two photons can prove it is static."

We can explain it on the basis of mechanism that leads to the Pauli Exclusion Principle which is described here [2]. Assume that an elliptical state of an electron in an atom observed by an external observer is globally static. The Scale-Symmetric Physics, [3], shows that such static state is in reality a state of two entangled circular states. If one of the two circular states represents a clock to gauge the evolution of the second circular state then due to the exchanged non-gravitating superluminal entanglon responsible for quantum entanglement (that carries the unitary spin), [3], the clock sees (so the internal observer sees as well) the other system evolve (the clock sees the two different circular states of the other system and the frequency of the jumps between them).

Similar mechanism acts inside protons and neutrons [3] but between the two entangled dense gluon fields (there are three such fields) is exchanged electric charge. Such exchanges lead to the mean fractional charges of the dense gluon fields. I showed that global rest mass measured by external observer is static whereas internal observer sees evolution of the other mass state.

References

[1] Ekaterina Moreva, Giorgio Brida, Marco Gramegna, Vittorio Giovannetti, Lorenzo Maccone, Marco Genovese (17 October 2013). "Time from quantum entanglement: an experimental illustration"
arXiv:1310.4691 [quant-ph]

[2] Sylwester Kornowski (7 December 2013). "Derivation of the Pauli Exclusion Principle and Meaning Simplification of the Dirac Theory of the Hydrogen Atom"
http://vixra.org/abs/1304.0081

[3] Sylwester Kornowski (6 March 2015). "The Scale-Symmetric Physics"
http://vixra.org/abs/1203.0021