Definition of Quantum Entanglement Using Spin-2 Gravitons

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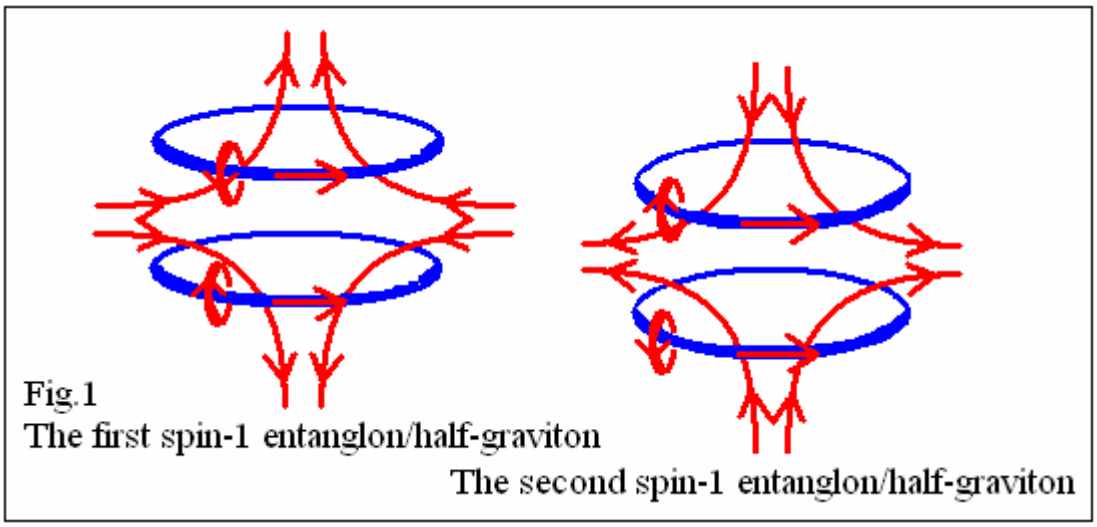
Abstract: Here, applying the Scale-Symmetric Theory (SST), we define quantum entanglement using spin-2 gravitons.

The basic phase transitions of the SST inflation field lead to the neutrinos composed of the superluminal binary systems of closed strings [1] – we can call them the spin-1 entanglons or half-gravitons. According to SST, the two closed strings in an entanglon/half-graviton have opposite internal helicities and are immersed in the SST superluminal Higgs field. The flows in the SST Higgs field forced by the internal helicities of the closed strings cause that the entanglons/half-gravitons are the very stable objects. Radius of the closed string is $R_{CS} = 0.944\cdot10^{-45}$ m (it is below the Planck scale), its inertial mass is $M_{CS,inertial} = 2.34\cdot10^{-87}$ kg, while linear speed is $v_{CS} = 0.727\cdot10^{68}$ m/s. On the other hand, the equatorial effective radius of the zero-rotational-energy neutrinos is $R_{Neutrino,effective} = 3.926\cdot10^{-32}$ m.

The entanglon (or half-graviton), due to its interaction with the SST Higgs field, carries the elementary "piece" of gravitational field i.e. elementary "piece" of the gradient produced by neutrino in the SST Higgs field.

There are two possibilities of flows of the Higgs field via the entanglon/half-graviton (see Fig.1).



In the Scale-Symmetric Theory, a pair of two different half-gravitons is the spin-2 graviton (see Fig.2). The SST graviton consists of the 4 superluminal closed strings each carrying the half-integral spin (all spins are parallel).

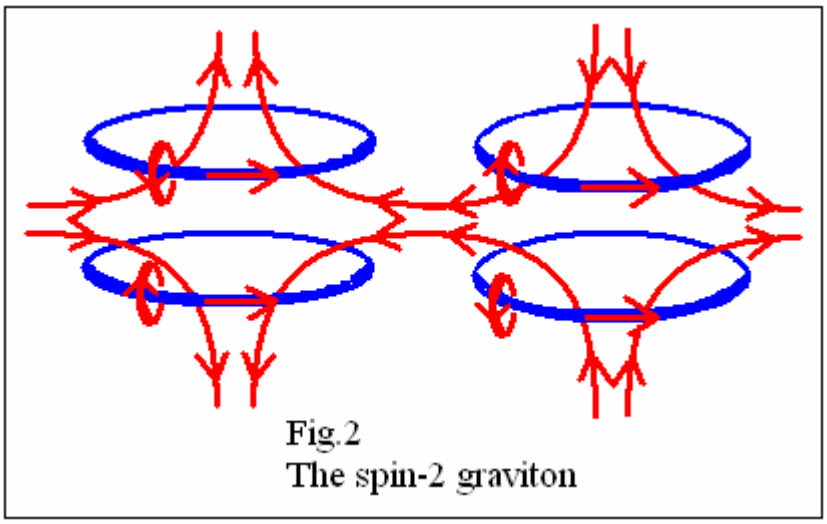


Fig.2
The spin-2 graviton

The definition of the quantum entanglement is as follows.

Quantum entanglement is the permanent mutual exchanges of the superluminal entanglons/half-gravitons or spin-2 gravitons between neutrinos or their pairs the visible matter consists of. The transmission of the information between the entangled particles is always superluminal but separation of parts of a visible particle (for example, of photons a neutral pion decays to) cannot be faster-than-light. Quantum entanglement is the classical phenomenon i.e. is realized by mutual exchanges of classical objects.

Emphasize that the neutrinos are built of the SST superluminal entanglons/half-gravitons and that the neutrino-antineutrino pairs are moving with the speed of light in “vacuum” in relation to a system with which they are entangled.

References

[1] Sylwester Kornowski (23 February 2018). “Foundations of the Scale-Symmetric Physics (Main Article No 1: Particle Physics)”
http://vixra.org/abs/1511.0188