Entanglement of two-qubit photon beam by magnetic field

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An experiment is proposed which can produce a quantum entanglement of photon beams having different frequencies and moving in the same direction. The experiment is controlled by an external magnetic field. In this experiment, the interaction between the photons and magnetic field is carried out by means of electrons interacting both with the photons and the external magnetic field. A theory is developed which describes physical processes in this experiment. The measure of entanglement of information and the measure of Schmidt are calculated for the general system of two qubits, as well as the residual measure for general system of three qubits. Using the information obtained from the analysis of the systems of two and three quasi-photons, we have calculated the entanglement measures in such cases. A computer program is created for numerical calculations in such cases which enables one to construct the graphs of dependence for entanglements of measures in bundles of two and three photons. The results allow us to see how the entanglement measure depends on the parameters that characterize the system in question. For example, if both polarizations of the photons coincide, then no entanglement takes place. The entanglement occurs only if the polarization of the photon are opposite.