Diploma thesis abstract

Mikhail Yu. Saigin

Scientific advisor Prof. Anatoly S. Chirkin

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Generation of multipartite entangled states in coupled optical interactions.

Quantum properties of two coupled parametrical processes which can be realize in aperiodically polled nonlinear crystals has been developed. The first one consist of two parametric down-conversion and one up-conversion processes. The second one consist of one parametric down-conversion and two up-conversion processes. It was established that this kinds of interactions can be the sources of tri- and fourpartite entangled states of light. Statistical and correlation properties has been developed: mean photon numbers, dispertion of photon number, 2-nd, 3-rd and 4-th order Glauber's correlation functions, for the second process covariation matrix of quadratures has been obtained.

It has been shown that on relative small interaction lengths the field has essential nonclassical character.

For the first kind of interactions density matrices and informational characteristics (conditional entropy and mutual information) was obtained.

The scheme for teleportation of twopartite entangled state by shared fourpartite entanglement between sender and receiver has been suggested.