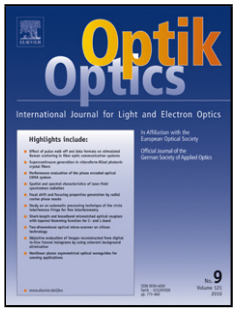

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Entangled nonlinear displaced number states

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Abstract

Entangled nonlinear displaced number states are defined as the superposition of separable two-mode nonlinear displaced number states. In this paper, the nonlinear functions related to the harmonious states and trapped ion motion in center of mass system are considered. Considering the importance of non-classical states in quantum information theory, we will study the non-classical properties of these states, such as photon statistics and entanglement. Photon statistics of the entangled nonlinear displaced number states is evaluated by calculating the Mandel parameter and second order coherence function; the entanglement of the states is also examined by calculating concurrence. According to our calculations, all of the introduced states have sub-Poissonian photon statistics in some range of coherent amplitude where this range becomes larger by increasing the number of the photons, n. It was also observed that the quantum second-order coherence function of the maximally entangled states represent photon antibunching effect in all values of the related parameters.

Keywords: displaced number states, nonlinear coherent states, photon statistics, entanglement.