

Statistical Properties and Algebraic Characteristics of Quantum Superpositions of Negative Binomial States

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Abstract: We introduce new kinds of states of quantized radiation fields, which are the superpositions of negative binomial states. They exhibit remarkable nonclassical properties and reduce to Schrödinger cat states in a certain limit. The algebras involved in the even and odd negative binomial states turn out to be generally deformed oscillator algebras. It is found that the even and odd negative binomial states satisfy the same eigenvalue equation with the same eigenvalue and they can be viewed as two-photon nonlinear coherent states. Two methods of generating such the states are proposed.

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