

Generation of Superpositions of Coherent States Along a Straight Line via Raman Interaction

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Abstract: We present an alternative scheme for preparing the superpositions of coherent states along a straight line of a cavity field using degenerate atom-cavity field Raman interaction. In the scheme, a collection of Λ -type three-level atoms is orderly sent through the cavity to interact with the cavity field adjusted by a microwave source connected to it, followed by state-selective measurements. In this way, we can prepare the superpositions of several coherent states along a straight line with arbitrary weighting factors for the cavity field. In the scheme, the coherence of the atom-cavity system may be maintained and the second microwave field is unnecessary, which is prior to the previous scheme.

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Key words: coherent states, superpositions, straight line, Raman interaction

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