

Preparation of Highly Squeezed States and Multi-component Entangled Coherent States via the Raman Interaction

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Abstract: A method is presented for generating highly squeezed states of a cavity field via the atom-cavity field interaction of the Raman type. In the scheme a sequence of three-level Λ -type atoms interacts with a cavity field, displaced by a classical source, in a Raman manner. Then the atomic states are measured. By this way the cavity field may collapse onto a superposition of several coherent states, which exhibits strong squeezing. The scheme can also be used to prepare superpositions of many two-mode coherent states for two cavity fields. The coherent states in each mode are on a straight line. This is the first way for preparing multi-component entangled coherent states of this type in cavity QED.

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Key words: squeezed state, Raman interaction, entangled coherent state

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