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Vibratile Coherence and Squeezing in Two Trapped Ions

ZENG Hao-Sheng,[1,2] KUANG Le-Man,[2] ZHU Xi-Wen[1] and GAO Ke-Lin[1]

[1] Laboratory of Magnetic Resonance and Atomic and Molecular Physics, Wuhan Institute of Physics and Mathematics, the Chinese Academy of Sciences, Wuhan 430071, China
[2] Department of Physics, Hunan Normal University, Changsha 410081, China
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Abstract: It is shown that two trapped ions interacting with laser beams resonant to the first red side-band of center-of-mass mode, in Lamb-Dicke regime and under rotating wave approximation, is described by a Jaynes-Cummings model. For the initial condition that the motional state of center-of-mass mode is in vacuum state and the internal state is prepared in a coherent superposition of states, coherence and squeezing for the vibratile motion of center-of-mass mode are discussed, particularly, a “weak” coherent state and a “weak”squeezed vacuum state are obtained. Collapse and revival are also observed in this type of initial condition.

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Key words: coherence and squeezing, center-of-mass mode

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