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Preparation of Motional Mesoscopic Superpositions of Squeezed Coherent States of N Trapped Ions

YANG Wen-Xing,[1,2] XIE Xiao-Tao,[1] LI Jia-Hua,[2] and CHEN Chang-Yong[2,3]

[1] Department of Physics, Huazhong University of Science and Technology, Wuhan 430074, China
[2] Center for Cold Atom Physics, the Chinese Academy of Sciences, Wuhan 430071, China
[3] Department of Physics, Loudi Teachers College, Loudi 417001, China
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Abstract: A scheme is proposed to generate arbitrary, discrete superpostions of squeezed coherent states of the squeezed center of mass of N trapped ions along a straight line in phase space. The scheme is based on a resonant bichromatic excitation of each trapped ion that generates displacement and squeezing in the vibrational motion conditioned to each internal state. In this paper, we also show that such a method can be used for the engineering of motional quantum states.

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