

Measurement of the Wigner Characteristic Function for the Center-of-Mass Motion of Two Trapped Ions

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Abstract: We proposed a scheme for the reconstruction of the quantum states for the center-of-mass vibrational mode of two trapped ions. In the scheme the ions are multichromatically excited by three lasers. Then measurement of the difference between probabilities of the ions being both in electronic ground and excited states directly yields the Wigner characteristic function for the center-of-mass vibrational state. The scheme can also be used to prepare entangled coherent states for the center-of-mass and relative vibrational modes.

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Key words: Wigner characteristic function, center-of-mass motion, trapped ion

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