

Abstract Submitted
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Characterization of the motional state of a quantum mechanical oscillator by coherent state transfer¹ HYOJUN SEOK, LUKAS BUCHMANN, SWATI SINGH, STEVEN STEINKE, PIERRE MEYSTRE, B2 Institute, Department of Physics and College of Optical Sciences, University of Arizona — We investigate theoretically a measurement scheme for the characterization of the motional state of a mechanical oscillator operating deep in the quantum regime. It is based on the coherent optomechanical transfer of the state of the mechanical element to the intracavity light field of an optical resonator with one end-mirror mounted on that oscillator. We consider both the case where the optical field is present at all times and the situation where it is turned on following the preparation of mechanical state. The roles of decoherence and dissipation on the fidelity of state transfer are considered in detail.

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