

Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Macroscopic tunneling of a membrane in an optomechanical double-well potential¹ LUKAS BUCHMANN, University of Arizona, LIN ZHANG, Shaanxi Normal University, ARAVIND CHIRUVELLI, University of Arizona, PIERRE MEYSTRE, University of Arizona — The quantum tunneling of a macroscopic mechanical object is considered in a “membrane-in-the-middle” optomechanical resonator. We show theoretically that a cavity mode which couples quadratically to the membrane’s position can create highly tunable adiabatic double-well potentials, which together with the high Q-factors demonstrated in such membranes render the observation of macroscopic quantum tunneling possible. We also show how a pulsed measurement scheme using a linearly coupled mode of the cavity can be used to monitor the tunneling.

¹Supported by the DARPA ORCHID program.

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Date submitted: 26 Jan 2012

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