

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Generation of squeezing: magnetic dipoles on cantilevers¹ HYOJUN SEOK, SWATI SINGH, STEVEN STEINKE, PIERRE MEYSTRE, B2 Institute, Department of Physics and College of Optical Sciences, The University of Arizona, Tucson, Arizona 85721 — We investigate the generation of motional squeezed states in a nano-mechanical cantilever. Our model system consists of a nanoscale cantilever – whose center-of-mass motion is initially cooled to its quantum mechanical ground state – magnetically coupled a classically driven mechanical tuning fork. We show that the magnetic dipole-dipole interaction can produce significant phonon squeezing of the center-of-mass motion of the cantilever, and evaluate the effect of various dissipation channels, including the coupling of the cantilever to a heat bath and phase and amplitude fluctuations in the oscillating field driving the tuning fork.

¹US National Science Foundation, the US Army Research Office, DARPA ORCHID program through a grant from AFOSR

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Date submitted: 15 Mar 2011

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