

Abstract Submitted  
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**Dissipation and cooling of a nanomechanical oscillator coupled to a Cooper pair box**<sup>1</sup> RAKESH TIWARI, D. STROUD, Department of Physics, The Ohio State University — We calculate the dynamics of a nanomechanical oscillator (NMO) coupled capacitively to a Cooper pair box (CPB), by solving a stochastic Schrodinger equation with two Lindblad operators. Both the NMO and the CPB are assumed dissipative. We show numerically that, if the CPB decay time is smaller than the NMO decay time, the coupled NMO will lose energy faster, and the coupled CPB more slowly, than the uncoupled NMO and CPB. We find that both of these effects are largest if  $\hbar$  times the NMO frequency equals the energy splitting of the CPB. Thus we show that an NMO can be cooled to low temperatures much more efficiently by coupling the NMO to a CPB.

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