Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Quantum many-body control beyond the adiabatic regime YOGESH S PATIL, HIL F H CHEUNG, Cornell University, ADITYA G DATE, California Institute of Technology, MUKUND VENGALATTORE, Cornell University — We demonstrate the optomechanical realization of a non-equilibrium heat engine in a system out-of-equilibrium with its environment. We investigate the limits on the work-extraction efficiency in such non-equilibrium systems which violate adiabaticity or indeed even the fluctuation-dissipation theorem. We discuss how such protocols can potentially be used to relate microscopic non-equilibrium equalities to macroscopic thermodynamic quantities and to shed light on the microscopic basis of thermodynamics. Furthermore, we describe how feedback and continuous measurements can be used to coax out-of-equilibrium quantum systems into novel correlated many-body quantum states. As an example of the power of such non-equilibrium processes, we demonstrate a dramatic increase in the squeezing achieved using a non-equilibrium transient protocol.

Yogesh S Patil
Cornell University

Date submitted: 28 Jan 2017 Electronic form version 1.4