Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Dissipation-driven two-mode mechanical squeezed states in optomechanical systems HUATANG TAN[1], University of Arizona, GAOXIANG LI, Huazhong Normal University, PIERRE MEYSTRE, University of Arizona — We propose two quantum optomechanical arrangements that permit the dissipation-enabled generation of steady two-mode mechanical squeezed states. In the first setup, the mechanical oscillators are placed in a two-mode optical resonator while in the second setup the mechanical oscillators are located in two coupled single-mode cavities. We show analytically that for an appropriate choice of the pump parameters the two mechanical oscillators can be driven by cavity dissipation into a stationary two-mode squeezed vacuum, provided that mechanical damping is negligible. The effect of thermal fluctuations is also investigated in detail and shows that ground state pre-cooling of the oscillators in not necessary for two-mode squeezing. These proposals can be realized in a number of optomechanical systems with current state-of-the-art experimental techniques.

[1]Visiting

Lukas Buchmann
University of Arizona

Date submitted: 24 Jan 2013 Electronic form version 1.4