

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Demonstration of the reversed dissipation regime in cavity electro-mechanics A.K. FEOFANOV, L.D. TOTH, N.R. BERNIER, T.J. KIPPENBERG, Ecole polytechnique federale de Lausanne — Cavity optomechanical phenomena, such as cooling, amplification or optomechanically induced transparency, emerge due to a strong imbalance in the dissipation rates of the parametrically coupled electromagnetic and mechanical resonators. Here we explore experimentally for the first time the reversed dissipation regime where the mechanical energy relaxation rate exceeds the energy decay rate of the electromagnetic cavity. We demonstrate optomechanically induced modifications of the microwave cavity resonance frequency and decay rate as well as mechanically-induced amplification of the electromagnetic mode and self-sustained oscillations (maser action) with high spectral purity of emitted microwave tone.

Alexey Feofanov
Ecole polytechnique federale de Lausanne

Date submitted: 06 Nov 2015

Electronic form version 1.4