Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Amplified opto-mechanical transduction of virtual radiation pressure NEILL LAMBERT, MAURO CIRIO, RIKEN, Japan, KAMANASISH DEBNATH, EPFL, Switzerland, FRANCO NORI, RIKEN, Japan — Nano-mechanical devices are widely used to measure a variety of weak signals: optical, electrical and even gravitational. This is partly due to the versatility of mechanical modes to interact with other systems. For example, radiation pressure, the transfer of momentum from photons to phonons, is the physical principle allowing for opto-mechanical transduction. In this work we study how an opto-mechanical probe can be used to observe virtual photons dressing the quantum ground state of an ultra-strongly coupled light-matter system. We show that such a signature is amplified when the opto-mechanical coupling strength is modulated at the mechanical frequency. Using a low-energy approximation we calculate analytically the limit on the thermal noise tolerated by this scheme.

Neill Lambert
RIKEN

Date submitted: 11 Nov 2016 Electronic form version 1.4