Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Improving optomechanical sensors with injected squeezing DAVID VITALI, MUHAMMAD ASJAD, STEFANO ZIPPILLI, Physics Division, University of Camerino — Optomechanical systems have recently entered the quantum domain and in this regime they may provide highly sensitive detection of masses, forces and displacements. We show how the performance of optomechanical systems can be significantly improved when the optomechanical cavity is driven not only by a laser but also by squeezed vacuum light with an appropriate phase. We show in particular the improvement in force sensing in the regime of coherent quantum noise cancellation [1], backaction cooling due to the possibility to suppress scattering at the Stokes sideband [2], and also the ability to entangle two mechanical resonators, even out of the resolved sideband regime [3]. [1] Ali Motazedifard, F. Bemani, M. H. Naderi, R. Roknizadeh, D. Vitali, New J. Phys. 18 (2016) 073040 [2] Muhammad Asjad, Stefano Zippilli, David Vitali, arXiv:1606.09007. [3] Muhammad Asjad, Stefano Zippilli, David Vitali Phys. Rev. A 93, 062307 (2016)

David Vitali
Univ of Camerino

Date submitted: 09 Nov 2016 Electronic form version 1.4