Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Cavity optomechanics with micromirrors: Measuring and reducing radiation pressure noise with bright squeezed light[1] JONATHAN CRIPE, ROBINJEET SINGH, Louisiana State Univ - Baton Rouge, MIN JET YAP, The Australian National University, GARRETT COLE, Crystalline Mirror Solutions LLC and GmbH, Santa Barbara CA, USA and Vienna, Austria, THOMAS CORBITT, Louisiana State Univ - Baton Rouge, LIGO COLLABORATION — On September 14, 2015, LIGO made the first direct detection of gravitational waves. Advanced LIGO is predicted to be limited by quantum noise at intermediate and high frequencies when it reaches design sensitivity in the next couple years. The quantum noise, including radiation pressure noise at intermediate frequencies, will need to be reduced in order to increase the sensitivity of future gravitational wave interferometers. We report recent progress towards measuring quantum radiation pressure noise in an optomechanical cavity and the reduction of radiation pressure noise using bright squeezed light. The low noise, microfabricated mechanical oscillator also allows for direct broadband thermal noise measurements which test thermal noise models and damping mechanisms and serves as a test bed for the application of crystalline coatings in future gravitational wave detectors. These techniques may be applicable to an upgrade of Advanced LIGO or the next generation of gravitational wave detectors.

[1]NSF Grant PHY-1150531

Jonathan Cripe
Louisiana State Univ - Baton Rouge

Date submitted: 11 Nov 2016 Electronic form version 1.4