Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Detecting continuous gravitational waves with a jug of superfluid SWATI SINGH, University of Arizona, LAURA DE LORENZO, AARON B. PEARLMAN, Caltech, IGOR PIKOVSKI, ITAMP, KEITH SCHWAB, Caltech — We investigate the sensitivity to narrow band, continuous-wave strain fields of a kg-scale optomechanical system formed by the acoustic motion of superfluid helium-4 parametrically coupled to a super-conducting microwave cavity. This narrowband detection scheme is tunable through pressurization of the helium, thereby making both doppler tracking of astrophysical sources and tuning the detector on/off from the source possible. For reasonable experimental parameters, we find that gravitational metric strain fields from nearby pulsars could be detected with a few weeks of integration time.

Swati Singh
University of Arizona

Date submitted: 31 May 2017 Electronic form version 1.4