

Abstract Submitted
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Detecting continuous gravitational waves with a jug of superfluid SWATI SINGH, University of Arizona, LAURA DELORENZO, AARON B. PEARLMAN, Caltech, IGOR PIKOVSKI, ITAMP, MILES BLENCOWE, Dartmouth College, 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 superconducting 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

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