Abstract Submitted
for the BPNMC21 Meeting of
The American Physical Society

Searches for sub-solar mass ultracompact objects with Advanced LIGO[1] PHOEBE MCCLINCY, RYAN MAGEE, ANNE-SYLVIE DEUTSCH, CHAD HANNA, Pennsylvania State University, CHRISTIAN HORST, DUNCAN MEACHER, University of Wisconsin-Milwaukee, CODY MESSICK, SARAH SHANDERA, Pennsylvania State University, MADELINE WADE, Kenyon College, LIGO-VIRGO-KAGRA COLLABORATION — The recent observations of stellar mass black hole binaries by Advanced LIGO and Advanced Virgo have revived interest in the possibility of sub-solar mass ultracompact objects. Due to the lack of knowledge surrounding the composition of sub-solar mass ultracompact objects, they have long been of interest as a potential dark matter candidate. Since astrophysical processes are not expected to produce ultracompact objects below one solar mass, the detection of such an object could be an indication of new physics. We aim to test this theory by conducting an Advanced LIGO search for sub-solar mass binaries. We describe the effects that signal frequency, black hole mass, and spin have on the computational difficulty of the search. The results of this work have been implemented in Advanced LIGO sub-solar mass searches.

[1]Funding for this project was provided by the Charles E. Kaufman Foundation of The Pittsburgh Foundation.

Phoebe McClincy
Pennsylvania State University

Date submitted: 13 Jan 2021 Electronic form version 1.4