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An Efficient Search for Gravitational Waves from Primordial Black Holes PHOEBE MCCLINCY, Department of Physics, The Pennsylvania State University , RYAN MAGEE, ANNE-SYLVIE DEUTSCH, CHAD HANNA, Institute for Gravitation and the Cosmos, The Pennsylvania State University, CHRISTIAN HORST, University of Wisconsin-Milwaukee, DUNCAN MEACHER, CODY MESSICK, SARAH SHANDERA, Institute for Gravitation and the Cosmos, The Pennsylvania State University, MADELINE WADE, Kenyon College, LIGO COLLABORATION — There is increasing interest in sub-solar mass black holes regarding the possibility that they are a component of dark matter, due to the limited knowledge regarding its composition. We are able to test the primordial black hole theory of dark matter by running a targeted sub-solar mass search using LIGO data. The range and difficulty of the search depends on certain parameters (defined below). We aim to define parameters that produce a search which simultaneously maximizes relative sensitivity and minimizes computational cost. We tested template bank size dependence on several parameter sets, including minimum/maximum frequency, minimum mass, and spin. As the template bank size increased, the overall computational cost of the project also increased. We determined that larger magnitudes of spin, wider frequency ranges, and smaller masses produce a larger template bank, and subsequently a higher computational cost. To obtain the lowest computational cost for this project, we would need to constrain the search parameters as much as possible. In the future, we will construct a search such that our parameters are as extensive as possible without substantial computational cost.

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