

Abstract Submitted
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Extending the Reach of Gravitational Wave Astronomy: Detection without Characterization RYAN PATRICK FISHER, LEE SAMUEL FINN, The Pennsylvania State University — Gravitational waves (GW) that may be too weak to be characterized or quantified may still be strong enough to be detected using statistical approaches. Similar to observing the light from a stellar cluster without resolving the individual stars, we seek to answer the question of whether GW signals may be detected to greater distances without providing a quantification of the wave. We describe a Bayesian approach to the problem of weak GW detection in noisy data. We identify the contribution of the observations to the odds that a signal is present. We demonstrate this method by examining a range of simulated signals and computing the volume of space over which a confident detection may be made. Finally, we compare the volume estimate to present detection methods, which utilize a signal to noise ratio threshold to characterize detections.

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