

Abstract Submitted
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High Precision Gravitational Wave Hubble Diagram with Pulsar Timing Arrays XIHAO DENG, LEE SAMUEL FINN, The Pennsylvania State University — Pulsar Timing Arrays act to detect gravitational waves from super-massive black hole binaries by observing the small, correlated effect the waves have on pulse arrival times at Earth. During the pulse propagation from the pulsar to the Earth, the black hole binaries will evolve driven by gravitational wave emission. By measuring this chirping effect, we can extract the chirp mass and the luminosity distance of the binary. Moreover, with an array of pulsars, we can localize the super-massive black hole binaries and find the host galaxies with corresponding redshifts. With known luminosity distances and corresponding redshifts, we can construct a gravitational Hubble diagram. We have found that by detecting and characterizing 10 to 20 gravitational wave sources with pulsar timing arrays, we can measure Hubble constant and dark energy equation of state within 10%.

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