

Abstract Submitted
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Gravitational Wave Astronomy of Supermassive Black Hole Binaries with Pulsar Timing Arrays XIHAO DENG, LEE SAMUEL FINN, The Pennsylvania State University — Pulsar timing arrays act to detect gravitational waves (GWs) by observing the small, correlated effect the waves have on pulse arrival times at the Earth. We find that pulsar timing observations of GWs are able to determine the sky position and other parameters of supermassive black hole binaries with extreme accuracy, given the high-precision astrometry and timing measurements of a group of millisecond pulsars expected to be provided by the Square Kilometer Array. We also discover that it is possible to use multiple GW sources to refine the distances to nearby pulsars in the array. In particular, one can achieve sub-parsec distance measurements for pulsars within 3 kpc through the observation of several supermassive black hole binaries.

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