

Gravitational Wave Probes of Physics Beyond Standard Model 2

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Gravitational Waves with Relative Astrometry

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Content :

Gravitational waves have offered us a whole new way of looking at our Universe. So far, we have seen them in the ~ 10 -100 Hz range, and there are hints that we might soon see them in the nanohertz regime. However, there are parts of the frequency space that are currently not covered by any future or planned observations. I will explain how we can use upcoming photometric surveys to bridge the gaps in the spectrum through relative astrometric measurements. Similar to the pulsar timing array measurements, these astrometric measurements rely on the coherent spacetime distortions produced by gravitational waves at Earth. These induce coherent, apparent stellar position changes on the sky. Upcoming photometric surveys will have excellent relative astrometry and timing resolution, which will make them perfect for these measurements. In particular, I will focus on how we can use the Roman Space Telescope to detect gravitational waves in the microhertz regime.

Primary authors :

Co-authors :

Presenter : PARDO, Kris (Caltech, US)

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