

Astrometric signatures of gravitational waves from compact binaries

Friday, 25 October 2024 12:00 (30 minutes)

Gravitational waves (GWs) induce characteristic oscillations in the observed positions of distant stars over time. This effect can potentially be captured by astrometric observations, such as those conducted by the Gaia mission, offering a promising method for detecting GWs by measuring tiny changes in the angular separations between pairs of point-like sources—effectively acting as large-scale detector arms. I explore the potential of this approach for detecting GWs, both from individually resolvable supermassive black hole binaries and from a stochastic background of GWs. I also examine how this method complements existing GW detection techniques, such as pulsar timing arrays, providing a novel means to probe gravitational waves across a broad range of scales and sources.

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Session Classification: Astrophysics