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Microlensing effect in the long-duration gravitational wave signals originating from Galactic sources

Detection of quasi-monochromatic, long-duration (continuous) gravitational wave radiation emitted by, e.g., asymmetric rotating neutron stars, planetary or asteroid mass - primordial BH (PBH) binaries during their inspiral phase in our Galaxy requires a long observation time to distinguish it from the detector's noise. If this signal is additionally microlensed by a lensing object located in the Galaxy, its magnitude would be temporarily magnified, which may lead to its discovery and allow probing of the physical nature of the lensing object and the source. We study the observational feasibility of Galactic microlensing of continuous gravitational wave signals in the point mass lens approximation by discussing the parameter space of the problem as well as by applying a gravitational wave detection method, the Time Domain F-statistic search, to ground-based detectors in the simulated data.

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