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Exploring Gravitational Waves from Extreme Mass Ratio Inspirals (EMRIs) in the Time-Frequency Domain with LISA

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Due to their unparalleled precision for measuring the properties of the massive black holes and testing general relativity, Extreme Mass Ratio Inspirals (EMRIs), which are composed of a massive black hole and a compact object, are one of the most promising sources of gravitational waves for space-based detectors such as the Laser Interferometer Space Antenna (LISA). The intricate nature of the signal, however, makes it difficult for astrophysicists to detect them. Realistic EMRI waveform generation is computationally laborious, which is a significant challenge for their detection and characterization. In order to save computing expenses while maintaining accuracy, we have created an approximated time-frequency representation of the EMRI waveform and LISA response. This representation will be useful not only for EMRIs but also for stellar origin black hole binaries and massive black hole binaries.

Speaker information

PhD 2nd year

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