Time-Domain Cosmology with Strong Gravitational Lensing

Contribution ID: 17

Type: Talk

Phase shift of lensed gravitational waves

Monday, 1 February 2021 23:30 (25 minutes)

Several gravitational wave signals of binary black hole coalescence in LIGO/Virgo O2 are found to show surprisingly coincident intrinsic and extrinsic parameters. Could they be multiple images of a gravitationally lensed source? Lensed gravitational waveforms are subject to a topological phase shift called the Morse phase shift. While the absolute Morse phase is degenerate with the source orbital phase, the relative Morse phase is measurable under the lensing hypothesis. We find that the candidate signals have relative Morse phases consistent with geometrical lensing, but the results point toward a peculiar configuration of multiple lensed images that are rarely realized by galaxy or galaxy cluster lenses. The Morse phase information will help with lens reconstruction for future detection of lensed gravitational waves.

Presenter: DAI, Liang