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Examining the Evidence for Gravitational Wave Lensing in LIGO-Virgo Observations

Gravitational waves (GWs) emitted from astrophysical sources can get lensed on their way to Earth, similar to electromagnetic waves. There are claims that detections made by LIGO and Virgo in earlier observational runs show evidence of lensing. Lensing has been invoked to explain the discovered high mass events, the bimodal mass function distribution of black holes, and for the objects in the mass-gap region. In this work, we critically examine these arguments and see if they are consistent with a variety of observational data (e.g., the inferred mass and redshift distributions of compact binaries and the non-observation of multiple images and stochastic GW background).

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