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Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run

LIGO Virgo KAGRA Webinar
Thursday 27 May 2021
1400 UTC (1000 Eastern US time)

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Abstract

The Advanced LIGO and Advanced Virgo detectors are now observing large numbers of gravitational-wave signals from compact binary coalescences, with 50 entries in the latest transient catalogue GWTC-2. With this rapidly growing catalogue, our ability to explore new research avenues improves. One such avenue with a long and productive history in electromagnetic astronomy – and great potential for the future of gravitational-wave astrophysics – is gravitational lensing.

This presentation covers the first LIGO-Virgo collaboration search for signatures of gravitational lensing in data from O3a, the first half of the third advanced detector observing run. We study:

- 1) the expected rate of lensing at current detector sensitivity and the implications of a non-observation of strong lensing or a stochastic gravitational-wave background on the merger-rate density at high redshift;
- 2) how the interpretation of individual high-mass events would change if they were found to be lensed;
- 3) the possibility of multiple images due to strong lensing by galaxies or galaxy clusters; and
- 4) possible wave-optics effects due to point-mass microlenses.

Our webinar will present results from our recent paper: <http://arxiv.org/abs/2105.06384>.

All welcome. Register online at:
tinyurl.com/lvk-webinar7