

# Search for sub-threshold lensed images of gravitational wave observations

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Gravitational lensing occurs when a large distribution of mass exists between a source and observer, acting as a lens and magnifying the amplitude of a signal emitted from the source. Gravitational waves can be lensed in this manner, similar to electromagnetic signals. In the case of strong lensing this can produce multiple images of the same gravitational-wave signal, each arriving at different times and with different magnification factors. The possibility that observed gravitational wave events are images of a single event has previously been explored in the literature. However, the possibility remains that additional images of these events remain in the background, unrecovered by previous searches. We carry out a targeted search specifically looking for sub-threshold lensed images of existing observations, using a reduced set of waveform filters. We present the results of this search and discuss the astrophysical implications of our new results.