Contribution ID : **358** Type : **Talk in parallel session**

Sub-threshold search for strongly lensed gravitational-wave events in the first half of LIGO-Virgo's third observing run

Tuesday, 31 August 2021 17:45 (15)

Strong gravitational lensing of gravitational waves can produce duplicate signals separated in time with different amplitudes. We consider the case in which strong lensing produces identifiable gravitational wave events and weaker sub-threshold signals hidden in the noise background. We present a search method for the sub-threshold signals using targeted template banks targeting specific confirmed gravitational wave events. We apply the method to all the gravitational-wave signals from compact binary coalescences detected by Advanced LIGO and Advanced Virgo during O3a, the first half of their third observing run. Finally, we present the top 8 possible lensed candidates for O3a gravitational wave events that passed our nominal significance threshold of False Alarm Rate 1 in 16 years. Furthermore, we discuss the likelihood that these candidates are strongly lensed.

Reference to paper (DOI or arXiv)

arXiv:2105.06384

Your gender (free text)

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Session Classification : Discussion Panel Gravitational Waves 1

Track Classification : Gravitational Waves