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The mass-distribution of LIGO's events as a probe for dark matter

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Primordial black holes (PBHs) may contribute to the observed abundance of dark matter. We use the black-hole mass distribution obtained from the detected binary black hole merger events by the LIGO/VIRGO gravitational-wave observatories, with a signal to noise ratio (SNR) > 8 . We search for and place limits on PBHs in the stellar-mass range. We also simulate binary black holes following models of formation of two separate populations of merging binaries: stellar-origin binary black holes and PBH binaries. For those we calculate the signal to noise ratio that would result on the LIGO detectors. Selecting only simulated merger events with a SNR > 8 , we fit the combination of these two components to the LIGO/VIRGO data. In our work, we rely on a wide range of black-hole mass distributions expected from models of formation of stellar-origin black holes and of PBHs.

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