

12th Iberian Gravitational Waves Meeting



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Narrowband searches for continuous and long-duration transient gravitational waves from known pulsars in the LIGO-Virgo third observing run

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Isolated neutron stars that are asymmetric with respect to their spin axis are possible sources of detectable continuous gravitational waves. This paper presents a fully-coherent search for such signals from eighteen pulsars in data from LIGO and Virgo's third observing run (O3). For known pulsars, efficient and sensitive matched-filter searches can be carried out if one assumes the gravitational radiation is phase-locked to the electromagnetic emission. In the search presented here, we relax this assumption and allow the frequency and frequency time-derivative of the gravitational waves to vary in a small range around those inferred from electromagnetic observations. We find no evidence for continuous gravitational waves, and set upper limits on the strain amplitude for each target. These limits are more constraining for seven of the targets than the spin-down limit defined by ascribing all rotational energy loss to gravitational radiation. In an additional search we look in O3 data for long-duration (hours-months) transient gravitational waves in the aftermath of pulsar glitches for six targets with a total of nine glitches. We report two marginal outliers from this search, but find no clear evidence for such emission either. The resulting duration-dependent strain upper limits do not yet surpass indirect energy constraints for any of these targets.

Which topic best fits your talk?

GW Experimental Results

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