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Search for gravitational wave signals from known pulsars in LIGO-Virgo O3 data using the 5n-vector ensemble method

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The 5n-vector ensemble method is a statistical multiple test for the targeted search of continuous gravitational waves from an ensemble of known pulsars. This method can improve the detection probability combining the results from individually undetectable pulsars if few signals are near the detection threshold. In this presentation, I show the results of the 5n-vector ensemble method considering the O3 data set from the LIGO and Virgo detectors and an ensemble of 223 known pulsars. I show no evidence for a signal from the ensemble and set a 95% credible upper limit on the mean ellipticity assuming a common exponential distribution for the pulsars' ellipticities. Using two independent hierarchical Bayesian procedures, the upper limits on the mean ellipticity are 2.2×10^{-9} and 1.2×10^{-9} for the analyzed pulsars.

Collaboration / Activity

LIGO-Virgo

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