



Contribution ID : 4

Type : **not specified**

Searching for gravitational-wave emission due to r-modes from the pulsar PSR J0537–6910 in LIGO O3 data.

Monday, 19 September 2022 11:30 (20)

I shall present results of the search for gravitational wave emission due to r-modes for the pulsar PSR J0537-6910 using data from the LIGO and Virgo ground based detectors in the O3 observing run. PSR J0537-6910 is a young X-ray pulsar and is currently the most frequent glitcher known. Its inter-glitch braking index suggests that gravitational wave emission due to r-modes may play an important role in the spindown of this pulsar. The times of the glitches during the O3 run were known from the timing ephemeris obtained from the NICER mission data. We searched for gravitational wave signals due to r-modes in the epochs between glitches. We do not detect any signals in the theoretically allowed band of 86-97 Hz, and report upper limits on the amplitude of the gravitational waves. Our upper limits place stringent constraints on theoretical models for r-mode driven spin-down in PSR J0537–6910.

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