

A new method to search for long-duration gravitational wave signals

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Spinning neutron stars are sources of long-duration continuous waves (CWs) that may be detected by interferometric detectors. We focus on glitching pulsars with abrupt spin-ups and long term spin-down, which imprint in CWs as transient signals from weeks to months. Standard method for identifying transient signals is the match-filtering, which combines a coherent detection statistics over time intervals of different duration. We propose a new method, where the most information from an initial search is considered in order to set up the post-following transient searches. In this method we localise a long-duration signal (longer than a few hours) when the start time and duration of the signal are unknown. We apply the method to search for transient CWs from the frequently glitching pulsar PSR J0537-6910 in the absence of parallel electromagnetic observations of the glitches.

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