

PHAROS Conference 2019: the multi-messenger physics and astrophysics of neutron stars



Contribution ID : 17

Type : **not specified**

A method for directed searches of continuous gravitational waves in advanced detector data

Continuous waves (CW) are still undetected gravitational wave signals emitted by rotating neutron stars, isolated or in binary systems. The estimated number of isolated neutron stars in our Galaxy is 10^8 - 10^9 . Information provided by electromagnetic observations is crucial to constrain the signal parameter space, lower the computational cost of a CW search and increase the number of potential targets. Accordingly to the information available about the source, different searches can be set up.

In this work we present prospects for the directed search of CW signals in advanced LIGO-Virgo data using the BSD-directed search method. A list of potentially interesting sources, which are present in the main astronomical catalogues, along with some young supernova remnants, is investigated and theoretical indirect upper limits are computed when possible. Estimate of the computational power needed to perform a directed search for the selected sources is also provided.

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