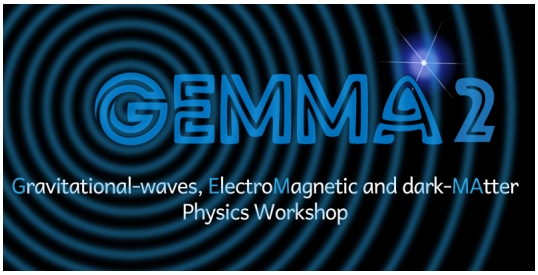

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Assessing the robustness of targeted searches for continuous gravitational wave signals in LIGO-Virgo data

The detection of continuous gravitational wave (CW) signals from rapidly rotating neutron stars remains a significant challenge for the LIGO and Virgo observatories. The robustness of the targeted searches for known pulsars is critical, as various factors can adversely affect the sensitivity and accuracy of detection. This poster will delve into the current robustness of our targeted search methodologies, focusing on the 5-vector pipeline and analyzing several key issues that could reduce sensitivity. These include: uncertainties in the source parameters which can lead to imperfect signal templates; frequency wandering of the CW signal; data quality problems like gaps in the observational data and non-stationary noise, both of which complicate the continuous wave search. By presenting the latest findings and strategies to mitigate these issues, this poster aims to enhance our understanding of the robustness of current search techniques and explore potential improvements to increase the sensitivity and reliability of targeted searches.

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