

Searching for continuous gravitational waves: data analysis strategies in LIGO/Virgo Collaboration

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Gravitational-wave astronomy is one of the youngest and the most dynamically progressing field in modern astronomy. It allows us to observe and understand objects and events invisible in electromagnetic waves. Among promising sources of gravitational waves are that continuously-emitted, periodic and almost-monochromatic gravitational waves are produced e.g. due to the elastically and/or magnetically-driven deformations (mountains on the NS surface supported by the elastic strain or magnetic field), or unstable oscillation modes (e.g., the so-called r-modes). Several data analysis strategies are developed and used by LIGO/Virgo Collaboration, like e.g. F -statistic method, frequency-Hough transform, Cross-Correlation method or 5-vector method. With the increasing number of the ground-based gravitational wave interferometers, sensitivity of continuous gravitational waves searches will improve and one can expect periodic signals to be detected in the future.

Primary author: SIENIAWSKA, Magdalena

Presenter: SIENIAWSKA, Magdalena

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