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Type: Talk in the parallel session

Searching gravitational wave signals in the post-merger phase after a binary black hole coalescences.

Thursday 8 July 2021 17:00 (20 minutes)

The current Gravitational Wave (GW) surveys of Binary Black Hole (BBH) mergers provide unprecedented probes of the dynamics in extreme gravitational fields and relativistic velocities. It will be presented a new method to search for possible low energetic signal with unknown morphologies features in the post merger phase of the gravitational wave signal from a BBH coalescences. Such transient features may reflect different theorized astrophysics processes: echoes of the merger signals from Black Hole mimickers, repeated GW gravity memory effects, or multiple copies of the asymmetric BBH chirp expected for special orientations of the source relative to the observer.

The search methodology is based on the un-modelled GW transient search algorithm coherentWaveBurst (cWB), widely used in the analysis of LIGO-Virgo-KAGRA data. It will be described in the talk, as its performances in terms of detection and estimation of echoes' characteristics on actual data from past LIGO-Virgo observing runs. The performances have been investigated by injecting a large set of simulated signals on actual LIGO-Virgo data. There will be reported the new upper limits in echoes detection set by this search on LIGO-Virgo open data and open catalogs of detected CBC.

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