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Detection of Compact Binary Coalescences and the Multi-Band Template Analysis

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The Multi-Band Template Analysis (MBTA) is a pipeline suited for searching for gravitational waves (GWs) emitted by coalescing compact binary systems (CBCs) in LIGO-Virgo data. It has been used ever since the first generation of interferometric GW detectors in its online configuration, and over the past years it has been improved to provide contributions to GW transient catalogues by developing an offline configuration. MBTA performs a template-based search by splitting the analysis in two frequency bands to reduce computational costs. It has been used in both its offline and online configuration to analyse data from the third observing run (O3) in the standard search, investigating for signals emitted by coalescing Binary Black-Holes (BBHs), Neutron Star Binaries (BNSs) and Neutron-Star-Black-Hole Binaries (NSBHs). At the moment, MBTA is contributing in the Sub-Solar Mass (SSM) search, seeking for signals emitted by compact binaries with at least one component with mass smaller than the mass of the Sun.

Auteur principal: NITOGIA, Elisa

Orateur: NITOGIA, Elisa

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