

Multi-band gravitational wave cosmology with stellar origin black hole binaries

Massive stellar origin black hole binaries, originating from stars above the pair-instability mass gap, are primary candidate for multi-band gravitational wave observations. In this talk we show the possibility to use them as effective dark standard sirens to constrain cosmological parameters, with a particular focus on the Hubble constant H_0 . The long lasting inspiral signal emitted by these systems is accessible by LISA, while the late inspiral and merger are eventually detected by third generation ground-based telescopes such as the Einstein Telescope. The direct measurement of the luminosity distance and the sky position of the source, together with the inhomogeneous redshift distribution of possible host galaxies, allow to infer cosmological parameters by probabilistic means. The efficiency of this statistical method relies in high parameter estimation performances, and we show that this multi-band approach allows a precise determination of the Hubble constant.

Author: MUTTONI, Niccolò (L2IT Toulouse, CNRS/IN2P3)

Orateur: MUTTONI, Niccolò (L2IT Toulouse, CNRS/IN2P3)

Classification de Session: LISA CosWG Workshop day 2