Contribution ID: **43**   Type: **not specified**

Bayesian parameter estimation of stellar-mass black-hole binaries with LISA

Wednesday, 8 September 2021 17:15 (30 minutes)

In this talk I will present a fully Bayesian parameter-estimation pipeline to measure the properties of inspiralling stellar-mass black hole binaries with LISA.

Our strategy (i) is based on the coherent analysis of the three noise-orthogonal LISA data streams, (ii) employs accurate and computationally efficient post-Newtonian waveforms –accounting for both spin-precession and orbital eccentricity–and (iii) relies on a nested sampling algorithm for the computation of model evidences and posterior probability density functions of the full 17 parameters describing a binary. We demonstrate the performance of this approach by analyzing the LISA Data Challenge (LDC–1) dataset.

In addition, we report on the successful recovery of an eccentric, spin-precessing source at signal-to-noise ratio 15 for which we can measure an eccentricity of 3×10^{-3} and the time to merger to within ~1 hour.

Primary author: Dr BUSCICCHIO, Riccardo (University of Birmingham)

Co-authors: Dr KLEIN, Antoine (University of Birmingham - Institute for Gravitational Wave Astronomy); Dr ROEBBER, Elinore (University of Birmingham - Institute for Gravitational Wave Astronomy); MOORE, Christopher J. (University of Birmingham - Institute for Gravitational Wave Astronomy); Mr FINCH, Eliot (University of Birmingham - Institute for Gravitational Wave Astronomy); Dr GEROSA, Davide (University of Birmingham - Institute for Gravitational Wave Astronomy); Prof. VECCHIO, Alberto (University of Birmingham - Institute for Gravitational Wave Astronomy)

Presenter: Dr BUSCICCHIO, Riccardo (University of Birmingham)

Session Classification: Gravitational Waves

Track Classification: Experimental Gravitation