

Detectability and parameter estimation capabilities of different configuration designs for Einstein Telescope (using GWJulia)

Future detectors of gravitational waves will be able to detect tens of thousands of compact binary coalescences every year. It is then important to have a quick and reliable way of performing the parameter estimation of these sources and the most common tool used in the literature for this purpose is the Fisher matrix. During this talk, I will present the open source code GWJulia, which performs Fisher matrix analysis of parameters of compact binary coalescences.

The code is written in Julia, making it significantly faster than the other codes available in the literature while maintaining the same level of accuracy.

Later, I will also present a case study using this code, comparing different designs for Einstein Telescope. I will present a comparison between a 10km triangular interferometer and two 15km L shaped interferometers with different orientations. In particular, I will focus on the detection of golden events and cosmological applications. Moreover, I will highlight a possible route of using the Fisher matrix to improve the convergence of MCMC sampling of future events.

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