

The impact data gaps have on parameter estimation

jeudi 24 novembre 2022 10:15 (15 minutes)

For the LISA instrument, data gaps are entirely unavoidable. We will expect to have scheduled data gaps due to antennae repointing or enforced data gaps to mask out instrumental artefacts. It is absolutely essential that the probabilistic models used to describe the data must be consistent with the data generating process itself. By including gaps in the data stream, the resultant noise process can no longer be treated as a stationary process, and thus the usual likelihood used throughout GW astronomy will be violated. In this talk, we will argue that familiar statistical quantities (SNR, Fisher matrix, likelihood etc.) must be generalised to account for such non-stationary features. We will show, using a toy model for illustrative purposes, the detrimental effect mis-modelling the masked noise as a stationary process has on parameter estimation. If time permits, we will conclude by demonstrating our formalism on MBHs in the presence of data gaps.

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Classification de Session: Conference session 2