

Neural density estimation for Galactic Binaries with LISA

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The future space gravitational wave detector LISA (Laser Interferometer Space Antenna) will have hundreds of thousands of Galactic Binaries (GBs) constantly present in the data stream. One of the challenging tasks from the data analysis point of view will be to estimate parameters of these GBs while disentangling them from each other and from other signals present in the data. This problem is quite often referred to as Global fit in the field of LISA data analysis. To find the posterior estimates of GBs sampling techniques are often used. However in such a challenging task sampling techniques have to rely on a carefully chosen proposals. In this paper we demonstrate how we can use Neural Density Estimators (in particular Normalising Flows) to fit for distributions and the way it can be used in making proposals. At the same time we demonstrate how these fits can be applied to the posterior density estimations and used as an alternative way to provide the results of the fits to the astronomical community.

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