Advances in Galactic Binary Searches with LISA

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1 Abstract

We present advances in data analysis strategies to detect and characterize ultracompact binaries from the LISA data stream. We demonstrate the pipeline on two years of simulated LISA Data Challenge data, containing ten Galactic binary signals similar to known verification binaries. We start with the parallel tempered MCMC pipeline designed for Galactic binary searches (Littenberg, 2011), which uses a trans-dimensional sampler for fitting sources and stationary noise simultaneously. We have developed new proposal distributions to improve sampling efficiency of longer duration observations, constructing the proposals from shorter observations. These analysis techniques will be useful for low-latency, or 'real-time', source extraction, critical to coordinating joint multi-messenger observations of transient events and for efficiently interfacing with the global LISA analysis.

References

Littenberg, T.B. 2011, PRD, 84, 063009