Contribution ID: **8** Type: **not specified**

Don't reinvent the wheel: including Extreme Mass Ratio Inspirals in the LISA global fit

Wednesday 25 June 2025 14:00 (20 minutes)

LISA data analysis poses many challenges.
The presence of persistent, long-lived, and overlapping sources in the data stream requires a global fit to all the parameters of all the source models simultaneously.
The number and variety of signals, together with the dimensionality of the parameter space, call for large computational resources and extremely optimized pipelines capable of leveraging the unique properties inherent to each source type.
Recent works in literature introduced global fit algorithms for analyzing the LDC2A dataset, which consists of Massive Black Hole binaries, Galactic Binaries, and instrumental noise.
In this work, we take the first steps towards introducing Extreme Mass Ratio Inspirals (EMRIs) in the GPU-accelerated pipeline "Erebor."
These signals represent one of the toughest challenges we have to face to fully exploit the scientific potential of the LISA mission, both from the modeling and analysis sides.
While the current state-of-the-art EMRI tools have recently enabled fully Bayesian parameter estimation studies through Markov Chain Monte Carlo (MCMC) methods, the inclusion of these sources in large-scale frameworks remains an open problem.
Here, we combine these tools with our pipeline's intrinsic modularity and flexibility, showcasing how straightforward it is to include (or remove) a block from our global fit "wheel."
While we do not focus on developing a working search pipeline for these sources, we show how to use search results to seed the global MCMC in the joint parameter estimation stage.
This will prepare us to tackle datasets of increasing realism and difficulty, starting with the next LISA Data Challenge.

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