Contribution ID : **21** Type : **not specified**

Gravitational waves from first-order phase transitions in LISA: reconstruction pipeline and physics interpretation

Wednesday, 16 October 2024 10:30 (20)

We develop a tool for the analysis of stochastic gravitational wave backgrounds from cosmological first-order phase transitions with LISA: we initiate a template databank for these signals, prototype their searches, and forecast their reconstruction. The templates encompass the gravitational wave signals sourced by bubble collisions, sound waves and turbulence. Accounting for Galactic and extra-Galactic foregrounds, we forecast the region of the parameter space that LISA will reconstruct with better than ~10% accuracy, if certain experimental and theoretical uncertainties are solved by the time LISA flies. We illustrate the accuracy with which LISA can reconstruct the parameters on a few benchmark signals, both in terms of the template parameters and the phase transition ones. To show the impact of the forecasts on physics beyond the Standard Model, we map the reconstructed benchmark measurements into the parameter spaces of the singlet extension of the Standard Model and of the classically conformal invariant $U(1)_{B-L}$ model.

Presenter(s) : MADGE, Eric (Instituto de Física Teórica (IFT-UAM/CSIC))

Session Classification : Contributed Talks