

Characterizing Anisotropic Stochastic Gravitational Wave Backgrounds and Foregrounds with the Bayesian LISA Pipeline (BLIP)

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LISA data is expected to feature at least one significant anisotropic stochastic gravitational wave (GW) signal: a galactic foreground comprised of the GW contribution from millions of unresolved double white dwarf (DWD) binaries throughout our galaxy. However, the Milky Way itself is not the only local host of such systems. For instance, the Large Magellanic Cloud (LMC) is expected to contain ~2 million unresolved DWDs; the resulting GW signal may therefore comprise an anisotropic GW background in LISA. We use the Bayesian LISA Pipeline (BLIP) to simulate realistic, population-derived stochastic signals from unresolved DWDs in both the Milky Way and LMC, and apply BLIP's all-sky spherical harmonic analysis to perform anisotropic searches for each. We present the results of these searches alongside new insight into the angular resolution of the spherical harmonic search, and discuss directions of further development in the area of anisotropic stochastic searches with LISA.

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