Incorporating a Stepping-Stone Sampling Algorithm into BayesWave

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BayesWave is a library of code used to analyze data from LIGO's gravitational wave detections. BayesWave uses Bayesian statistics to reconstruct signals and determine possible sources. The likelihoods of various models can be compared, such that BayesWave can determine the most likely sizes, locations, and types of sources that could produce a certain detected signal. Currently, BayesWave uses Thermodynamic Integration (TI) to calculate the likelihoods of various models. An alternative method is called Stepping-Stone (SS) sampling. In other fields, SS has been shown to be as accurate as TI while also being less computationally expensive. This project explores the comparison between TI and SS methods when each is applied inside BayesWave, to determine if SS is a viable replacement for TI to be used for analysis of LIGO's fourth detection run in 2023.