

M. Crisostomi: Neural Posterior Estimation with guaranteed exact coverage: the ringdown of GW150914 (WP4)

Tuesday, June 6, 2023 3:50 PM (40 minutes)

I will present the analysis of the ringdown phase of the first detected black-hole merger, GW150914, using a simulation-based inference pipeline based on masked autoregressive flows. We obtain approximate marginal posterior distributions for the ringdown parameters, namely the mass, spin, and the amplitude and phases of the dominant mode and its first overtone. Thanks to the locally amortized nature of our method, we are able to calibrate our posteriors with injected simulations, producing posterior regions with guaranteed (i.e. exact) frequentist coverage of the true values. For GW150914, our calibrated posteriors provide only mild evidence (~ 2 sigma) for the presence of an overtone, even if the ringdown is assumed to start at the peak of the amplitude.