

Abstract Submitted
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LISA parameter estimation and source localization with higher harmonics of the ringdown¹ EMANUELE BERTI, VISHAL BAIBHAV, Johns Hopkins University, VITOR CARDOSO, Instituto Superior Tecnico — LISA can detect higher harmonics of the ringdown gravitational-wave signal from massive black-hole binary mergers with large signal-to-noise ratio. The most massive black-hole binaries are more likely to have electromagnetic counterparts, and the inspiral will contribute little to their signal-to-noise ratio. Here we address the following question: can we extract the binary parameters and localize the source using LISA observations of the ringdown only? Modulations of the amplitude and phase due to LISAs motion around the Sun can be used to disentangle the source location and orientation when we detect the long-lived inspiral signal, but they can not be used for ringdown-dominated signals, which are very short-lived. We show that (i) we can still measure the mass ratio and inclination of high-mass binaries by carefully combining multiple ringdown harmonics, and (ii) we can constrain the sky location and luminosity distance by relying on the relative amplitudes and phases of various harmonics, as measured in different LISA channels.

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