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Self-forced evolutions for comparable and intermediate mass ratio coalescences ELIU HUERTA[1], West Virginia University, PRAYUSH KUMAR, Syracuse University, JONATHAN GAIR, University of Cambridge, SEAN MCWILLIAMS, West Virginia University — The quest for intermediate mass black holes (IMBHs) has been revived by the recent detection of hyper-luminous X-ray sources. To confirm that these sources host IMBHs, we require a robust measurement of the mass of the central object. Advanced gravitational wave detectors may detect from 1-30 events per year that involve the coalescence of stellar mass black holes with IMBHs in globular clusters. Furthermore, it is expected that neutron star-black hole mergers will have electromagnetic counterparts, whose detection will provide important information about the astrophysical properties of their progenitors. Detecting these events and learning about the stellar dynamics of their environments require accurate waveform models. After discussing the inadequacy of post-Newtonian calculations and black hole perturbation theory to capture the true dynamics of these sources, we introduce a waveform model that includes the inspiral, merger and ringdown in a physically consistent way. We show that our self-forced evolution model provides a robust and accurate framework to model these type of events, and explore the information that could be extracted from the observation of these events using a four detector network in the context of second and third generation gravitational wave detectors

[1]We introduce a self-forced evolution waveform model that includes the inspiral, merger and ringdown phases to describe neutron star-black hole mergers, and explore the information that could be extracted from these events using a four detector network

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