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Applying Numerical Relativity Results to Massive Black Hole Binary Observation[1] SEAN MCWILLIAMS, NASA GSFC / UMD — Coalescing binary black holes may be the most promising candidate sources for gravitational wave detection for both ground- and space-based interferometers, due to the strength of their emitted signals. In order to maximize the probability of detection, extract physical parameters from detected waveforms, and make predictions which can be compared with measurements as a test of general relativity, accurate templates for the gravitational radiation emission must be available. Post-Newtonian approximations may be used to predict the characteristics of an emitted waveform, but those approximations lose accuracy and eventually become aphysical as the binary reaches the end of the inspiral phase approaching merger. The field of numerical relativity is now capable of the accurate calculation of this last phase of coalescence, when the black holes finish their inspiral and merge to form a single perturbed Kerr black hole. We present applications of the waveform as a template for use in data analysis for the ground-based interferometer LIGO, its planned upgrade Advanced LIGO, and the space-based interferometer LISA.

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