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Extending empirical models for binary black hole merger-ringdown waveforms to include late inspiral JOHN BAKER, NASA-Goddard Space Flight Center, BERNARD KELLY, CRESST/UMBC and GSFC — Analytic and empirical models for gravitational merger waveforms are a valuable tool for efficiently encoding the information from expensive numerical relativity simulations. Such models can be applied as a practical intermediary for gravitational-wave data analysis studies and may provide interesting heuristics for interpretation of waveform phenomenology. In the Implicit Rotating Source description of waveforms, we exploit the simple structure of computed spherical harmonic components for near-circular mergers, to represent the waveforms through the secular development of a circularly polarized waveform. We have previously presented waveform models for the most powerful merger-ringdown portions of these waveforms following an approach which first describes rotational frequency as a function of time, then treats amplitude in terms of the phasing behavior. A parametric representation of time and frequency allows useful extension of the waveforms back through the late inspiral. We present results showing precise fits for numerical relativity ($\ell = 2, m = 2$) waveform phasing with the extended model.

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