

Improving the analytical representation of Postmerger and Ringdown of TEOBiResumMultipolar

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Abstract. The postmerger-ringdown waveform of coalescing, non-precessing, spinning binary black holes in the TEOBiResumMultipolar waveform model is given by a closed form, analytic, time-domain family of template waveforms, informed by a large set of Numerical Relativity waveforms from different codes such as the BAM code, the SpEC code and state-of-the-art test-particle waveforms. The NR waveforms cover the parameter space from the equal mass case till the test-particle limit. This includes 5 waveforms generated by the BAM code with mass ratio $m_1/m_2 = 18$ and with the heavier BH spinning with spins up to ± 0.8 .

Stand alone the model can be a useful tool on high-SNR signals coming from BBH coalescences, with high-mass binaries as optimal candidates. Potential candidates are GW150914 and GW170729. Analyzing the signals directly in the time-domain, using the analytical postmerger-ringdown waveform model, gives a fully independent measurement of the source parameters. Further, it was demonstrated in *arXiv:1811.08744* that fits of key waveform characteristics, such as peak amplitude and frequency, could be used for consistency tests of general relativity in the strong-field regime.