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Targeted Numerical Relativity Surrogate Waveform Model for GW190814 JOOHEON YOO, VIJAY VARMA, MATTHEW GIESLER, Cornell University, MARK SCHEEL, California Institute of Technology, LAWRENCE KIDDER, Cornell University, HARALD PFEIFFER, Albert Einstein Institute — The recent detection of GW190814 highlights the need for reliable, high-accuracy gravitational waveform templates for binary black holes of high mass ratios. We describe NRHybSur2dq15, a surrogate model for hybridized, non-precessing numerical relativity (NR) waveforms, extending the previously explored mass ratio ranges. In this model, we train the surrogate over two parameters: the mass ratio, $q \in [1, 15]$, and the spin of the higher-mass black hole, $|\chi_z^1| \leq 0.8$. For the training, we use hybrid waveforms generated from the NR simulations. The new surrogate model reproduces the hybrid waveforms with reasonable mismatches over the entire LIGO band for stellar-mass binaries. The surrogate model also is quite robust to extrapolations of the parameters. Finally, we use templates generated from the surrogate model for parameter estimation of GW190814.

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