

Title: "Mergers of black-hole binaries with aligned spins: Waveform characteristics"

Abstract (subject to minor changes):

"We apply our gravitational-waveform analysis techniques, first presented in the context of nonspinning black holes of varying mass ratio [1], to the complementary case of equal-mass spinning black-hole binary systems. We find that, as with the nonspinning mergers, the dominant waveform modes phases evolve together in lock-step through inspiral and merger, supporting the previous model of the binary system as an adiabatically rigid rotator driving gravitational-wave emission – an implicit rotating source (IRS). We further apply the late-merger model for the rotational frequency introduced in [1], along with a new mode amplitude model appropriate for the dominant  $(2, \pm 2)$  modes. We demonstrate that this seven-parameter model performs well in matches with the original numerical waveform for system masses above  $\sim 150M_{\odot}$ , both when the parameters are freely fit, and when they are almost completely constrained by physical considerations."