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## Parametrized 5.5PN accurate TaylorF2 approximant and its use in Parameter Estimation

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We start from the state-of-the-art effective one-body (EOB) model and suitably expand it up to 5.5PN order in the orbital (nonspinning) case.

By comparing the so-obtained high-order PN phasing with the corresponding EOB one, we conclude that the 5.5PN approximation delivers a reliable phasing description up to  $M\omega = 0.05$  for comparable mass binaries. Although such cutoff frequency is reduced when the mass ratio is increased, the EOB/PN agreement is better with the 5.5PN approximant with respect to the standardly used 3.5PN one, especially at low frequencies. Beyond that, an injection/recovery study is done. The injected waveforms are `{\tt TEOBResumS}` ones and we recover them using the TaylorF2 with a certain tidal part, that can be either the 6PN one (leading order), or the NRTidal one. We illustrate that the purely analytical point mass information is relevant in reducing the PE biases on the tidal parameters, analyzing our result for the Sly and h4 equations of state.

### Summary

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