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A new phenomenological waveform model for binary neutron star systems of unequal masses

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Detections of binary neutron star mergers with gravitational waves have the potential to constrain the currently unknown neutron star equation of state through tidal measurements. This is made possible with accurate and efficient tidal waveform models. In this talk, I present PhenomGSF: a new phenomenological tidal phase model for neutron stars with unequal masses. PhenomGSF is constructed to reproduce the gravitational self-force (GSF) informed tidal phase of TEOBResumS with high computational speed. PhenomBNS i) provides an accurate tidal description with fast evaluation speed, ii) a modular framework such that it can be linearly added to any binary black hole waveform, iii) does not assume hadronic matter or universal relations, allowing for exotic matter analyses. We validate the model by comparing it to numerical relativity (NR), and present results for GW170817 data to show consistency with other tidal waveform models.

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