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Accuracy and precision of gravitational-wave models of inspiraling neutron star-black hole binaries with spin: Comparison with matter-free numerical relativity in the low-frequency regime[1] SWETHA BHAGWAT, Syracuse Univ, PRAYUSH KUMAR, Canadian Institute for Theoretical Astrophysics, KEVIN BARKETT, Theoretical Astrophysics 350-17, California Institute of Technology, NOUSHA AFSHARI, Gravitational Wave Physics and Astronomy Center, California State University Fullerton, DUNCAN A. BROWN, Syracuse University, GEOFFREY LOVELACE, 4Gravitational Wave Physics and Astronomy Center, California State University Fullerton, MARK A SCHEEL, BELA SZILAGYI, Theoretical Astrophysics 350-17, California Institute of Technology, LIGO COLLABORATION — Detection of gravitational wave involves extracting extremely weak signal from noisy data and their detection depends crucially on the accuracy of the signal models. The most accurate models of compact binary coalescence are known to come from solving the Einstein's equation numerically without any approximations. However, this is computationally formidable. As a more practical alternative, several analytic or semi analytic approximations are developed to model these waveforms. However, the work of Nitz et al. (2013) demonstrated that there is disagreement between these models. We present a careful follow up study on accuracies of different waveform families for spinning black-hole neutron star binaries, in context of both detection and parameter estimation and find that SEOBNRv2 to be the most faithful model. Post Newtonian models can be used for detection but we find that they could lead to large parameter bias.

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