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Gravitational Waveforms in the Early Inspiral of Black Hole-Neutron Star Systems KEVIN BARKETT, California Institute of Technology, SXS COLLABORATION[1] — One of the target systems for gravitational wave detection by aLIGO is a black hole-neutron star (BHNS) binary. For moderate to large black-hole spins, different post-Newtonian approximants disagree for BHNS systems even early in the inspiral, necessitating accurate yet computationally expensive numerical relativity simulations that cover many orbits in the inspiral regime. Because matter and tidal effects are expected to influence the system only when the two bodies are extremely close together, I simulate binary black hole systems of mass ratio 7 as a proxy for BHNS systems during inspiral. I will carry out numerical relativity simulations, keeping the smaller ("neutron star") object spinless testing various spins on the larger black hole. These waveforms will be compared with the post-Newtonian approximants to analyze the robustness of hybridizing long numerical relativity waveforms with post-Newtonian ones to generate long gravitational waveforms which cover the full aLIGO frequency band.

[1]Simulating eXtreme Spacetimes

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