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Making and Testing Hybrid Gravitational Waves from Colliding Black Holes and Neutron Stars ALYSSA GARCIA, GEOFFREY LOVELACE, Cal State Univ- Fullerton, SXS COLLABORATION — The Laser Interferometer Gravitational-wave Observatory (LIGO) is a detector that is currently working to observe gravitational waves (GW) from astronomical sources, such as colliding black holes and neutron stars, which are among LIGO's most promising sources. Observing as many waves as possible requires accurate predictions of what the waves look like, which are only possible with numerical simulations. In this poster, I will present results from new simulations of colliding black holes made using the Spectral Einstein Code (SpEC). In particular, I will present results for extending new and existing waveforms and using an open-source library. To construct a waveform that spans the frequency range where LIGO is most sensitive, we combine inexpensive, post-Newtonian approximate waveforms (valid far from merger) and numerical relativity waveforms (valid near the time of merger, when all approximations fail), making a hybrid GW. This work is one part of a new prototype framework for Numerical INJection Analysis with Matter (Matter NINJA). The complete Matter NINJA prototype will test GW search pipelines' abilities to find hybrid waveforms, from simulations containing matter (such as black hole-neutron star binaries), hidden in simulated detector noise.

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