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Reading oscillation modes from waveforms in numerical relativity simulations of rotating neutron stars MIGUEL GRACIA LINARES, PABLO LAGUNA, Georgia Inst of Tech, KOSTAS KOKKOTAS, University of Tuebingen, Germany — The next generation of higher sensitivity gravitational wave detectors and advanced electromagnetic observations will open the door to prove the nature of matter inside of neutron stars, among it the equation of state above nuclear density. An important component of this endeavor is understanding the connection between fundamental oscillation modes in neutron stars and modes in the corresponding gravitational radiation. We present results of perturbed, rapidly rotating neutron star models in full general relativity as a source of gravitational radiation. From a series of non-linear numerical relativity simulations of uniformly rotating polytropes, we calculate the f-mode frequency and decaying time of oscillations from the extracted gravitational waveform. We discuss the ability of numerical relativity codes to provide estimates of oscillation modes from neutron star binary mergers.

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