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Estimating the Braking Index for Isolated Asymmetrically Rotating Young Neutron Stars Using Machine Learning[1] TERESITA RAMIREZ, California State University, Fullerton — Since the first gravitational wave detection on September 15th, 2015, both the Laser Interferometer Gravitational-wave Observatory (LIGO) and Virgo detectors have seen 11 confirmed gravitational-wave signals, and their third observing run is ongoing. So far, all of the confirmed gravitational-wave signals came from merging compact objects (black holes and neutron stars). Another class of gravitational waves that LIGO and Virgo might observe is long duration transient signals emitted from isolated, young, asymmetrically rotating neutron stars. The duration of these transients can be anywhere between hours to days, and because of this it can be very computationally expensive to recover these signals and to infer properties of their sources (such as the braking index, which characterizes how a neutron star spins down). One promising approach for reducing the computational cost of these searches is machine learning using neural networks. In this poster, I explore different ways in which a neural network, still under development by researchers in Rome (at Universita‘ degli Studi di Roma La Sapienza), predicts the variation in braking index and the value of the fixed braking index of simulated signals injected into white noise.

[1]NSF, University of Florida Physics Department

Teresita Ramirez
California State University, Fullerton

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