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Numerical simulations of oscillations in differentially rotating neutron stars

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The accurate modelling of neutron star oscillations is essential as we prepare for the next generation of gravitational-wave detectors, which will be able to probe the rich astrophysical content of post-merger signals. In this talk, I will present recent results obtained with ROXAS, a spectral code that numerically simulates the dynamical evolution of perturbed rotating neutron stars, extracting their emitted gravitational waves. In particular, I will show how the introduction of differential rotation alters the frequencies of axisymmetric and non-axisymmetric modes, comparing them with the values reported in the literature where available, and highlighting the new results.

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