NewCompStar School 2017 - "Neutron stars: theory, observations and gravitational waves emission"



Contribution ID: 3

Type: Poster

Stability Criterion for Differentially Rotating Neutron Stars

Uniformly rotating neutron stars have been part of many studies in theoretical astrophysics. While a stability criterium against gravitational collapse to a black hole is well known for this type of star, it is not for differentially rotating neutron stars, which are thought to be the outcome of binary neutron star mergers. The stability of the merger remnant has important implications on the expected gravitational wave signal. This study indicates, that a stability criterion for differentially rotating neutron stars exists similar to the one of their uniformly rotating counterparts: along a sequence of constant angular momentum dynamical instability sets in for central rest mass densities below the one of the equilibrium solution at the turning point. Together with this, a universal relation will be shown, which for a given angular momentum and degree of differential rotation allows to determine the turning point independently of the used equation of state.

Author: LUKAS, Weih (Institute for Theoretical Physics, Goethe University)Presenter: LUKAS, Weih (Institute for Theoretical Physics, Goethe University)Session Classification: Poster session