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Stability of Neutron Stars for Causal Relativistic Viscous Fluids

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First order relativistic viscous theories had, until recently, been believed to not be well-behaved (i.e. causal, stable and strongly hyperbolic). Because of this, relativistic viscosity in astrophysical contexts has remained understudied. Recently, the Bemfica-Disconzi-Noronha-Kovtun (BDNK) theory has been shown to be causal, stable and strongly hyperbolic, which makes it a well-suited model for extending viscosity in the relativistic regime. In this presentation, I study the stability of neutron stars to viscous effects through perturbation theory and find necessary conditions for radial stability for the BDNK theory.

Author: CABALLERO, Daniel (University of Illinois Urbana-Champaign)

Co-author: Prof. YUNES, Nicolás

Presenter: CABALLERO, Daniel (University of Illinois Urbana-Champaign)