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Dynamical and Thermodynamic Stability of Perfect Fluid Stars
JOSHUA SCHIFFRIN, University of Chicago, STEPHEN GREEN, University of Guelph, ROBERT WALD, University of Chicago — We explore the stability of stationary axisymmetric perfect fluid configurations to axisymmetric perturbations in general relativity. We consider the class of perturbations which keep the particle number, entropy, and angular momentum of each fluid element fixed. We show that the condition for dynamical stability with respect to such perturbations is equivalent to positivity of the canonical energy. Additionally we show that, with respect to this class of perturbations, dynamical stability is equivalent to thermodynamic stability.

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