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Symmetry energy dependence of the bulk viscosity of nuclear matter

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We clarify how the weak-interaction-driven bulk viscosity ζ and the bulk relaxation time τ_{Π} of neutrino-transparent npe matter depend on the nuclear symmetry energy. We show that, at saturation density, the equation-of-state dependence of these transport quantities is fully determined by the experimentally constrained nuclear symmetry energy S and its slope L. Variations of L within current experimental uncertainties can change the bulk viscosity by orders of magnitude. This suggests that dissipative effects encoded in the gravitational-wave signatures of binary neutron star inspirals may help constrain nuclear symmetry energy properties.

Altas energias

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