Oscillations of hot, young neutron stars: Gravitational wave frequencies and damping times

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We study how the frequencies and damping times of oscillations of a newly born, hot proto-neutron star depend on the physical quantities which characterize the star quasi-stationary evolution which follows the bounce. Stellar configurations are modeled using a microscopic equation of state obtained within the Brueckner-Hartree-Fock, nuclear many-body approach, extended to the finite-temperature regime. We discuss the mode frequency behaviour as function of the lepton composition, and of the entropy gradients which prevail in the interior of the star. We find that, in the very early stages, gravitational wave emission efficiently competes with neutrino processes in dissipating the star mechanical energy residual of the gravitational collapse.

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