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Finite-temperature equations of state of compact stars with hyperons

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The equation of state (EoS) for dense, strongly interacting matter serves as the central input in an array of astrophysical simulations involving isolated compact objects and binary systems across various scenarios. While numerous models exist to describe the composition of cold neutron stars, the range narrows considerably when considering the so-called general-purpose EoS, which encompass varying temperature, density, and electron fraction. Moreover, several EoS models that include non-nucleonic degrees of freedom in dense matter, like hyperons, have been rendered incompatible with the recently imposed astrophysical constraints extracted from observations. In this talk, I will discuss the generation of finite temperature EoS of hypernuclear matter in the range of densities, temperatures, and electron fractions that are needed for numerical simulations of supernovas, protoneutron stars, and binary neutron star mergers, along with the variation of their generic features and composition depending on the parametrization of the baryon-meson couplings. Finally, I will present the results for the properties of neutron stars constructed with the zero-temperature version of those EoS and their comparison with the existing astrophysical observations.

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