Influence of strange matter admixtures on macroscopic properties of neutron stars *

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We used the equations of state of dense nuclear matter to construct the macroscopic properties of neutron stars and test them using available observational results. The Dirac-Brueckner-Hartree-Fock mean field calculations (see e.g. [1]) approximated by their parameterized form [2] are the basis of our calculations. Their formulation envisages also the presence of hyperons in addition to neutrons and protons usually considered in the core of a neutron star. For the outer regions, we used the classical EoS's, and Tolman-Oppenheimer-Volkoff equation [3] was employed to follow the variables from the surface to the centre of the star. We calculated the central pressure and density and correspondingly the possible radius and mass without allowance for hyperons first, and compared these results with recent astronomical observations (e.g. [4-8]). The astronomical data imposed constraints on the considered EoS's, and they can be used to exclude some of them. Finally, we studied the influence of hyperon admixture to the nucleon matter on the macroscopic properties of the neutron stars, and compared these calculations to those without hyperon inclusion.

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