



INFLUENCE OF NUCLEAR SYMMETRY ENERGY ON PROPERTIES OF NEUTRON STAR OUTER CORE MATTER

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ABSTRACT

Based on the mean-field approximation of relativistic σ - ω - ρ model with the nonlinear self-interaction of σ meson and density-dependent coupling constants respectively, the nuclear symmetry energy S , its slope L and curvature K as well as the proton fraction x_p and the pressure P of the matter in the outer core of neutron star are studied. It is found that greater S in high-density region and L at saturation density produce greater proton fraction and pressure of neutron star outer core matter. And the density threshold of proton super fluidity and the direct URCA process, which are model dependent, decrease as the nuclear symmetry energy increases.

KEYWORDS: *Nuclear Symmetry Energy, Pressure, Proton Fraction, Neutron Star Outer Core Matter*

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