

## Neutron Star Matter Including Delta Isobars

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**Abstract:** In this paper a new phase structure of neutron star matter including nucleons and delta isobars is presented. Particle fractions populated and pion condensations in neutron star matter are investigated in this model. The existence of the pion condensations can postpone the appearance of delta isobars. We found that both the pion condensation and reduce of the ratio of delta isobar to nucleons couplings can soften the corresponding equation of state. The maximum masses and their corresponding radii of neutron stars are calculated, and the obtained values are in observational region.

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