Cold Hybrid Star Properties

H. R. Moshfegh, M. Daremoradi
Department of Physics, University of Tehran, North Karegar, 14399-55961, Tehran, Iran.

We examine the matter inside the neutron stars, strange stars and neutron stars with quark core (Hybrid stars). Such dense objects are good candidate for testing the equation of state of baryonic matter both zero and finite temperature. In hybrid stars we study the hadron-quark phase transition in the interior of star. We have used MIT bag model with constant and density dependent bag parameter, $B(\rho)$, for quark phase. We have calculated the equation of state of hadronic matter part of star using two model, first we use statistical Thomas-Fermi approach by employing Myers-Swiatecki density dependent potential [1] and then by using the lowest order constraint variational (LOCV) method [2] by employing AV_{18} and $Reid93$ channel dependent potential. The mass-radius relation of various type of these compact objects are obtained. We have found that in hybrid stars the maximum mass fall in relatively narrow interval in compare to regular pure neutron stars. The maximum mass of star are highly dependent to choice of interaction. Finally we have compared our calculated results with other methods and interactions.

[1] H. R. Moshfegh, IJMP **E 15**, 1127 (2006).
[2] M. Modarres, T. pourmirjafari, H.R. Moshfegh, Nucl. Phys. **A 819**, 27 (2009).