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Hadonic Star Matter in an RMF Model with a SCL Chiral Potential KOHSUKE TSUBAKIHARA, Department of Cosmophysics, Hokkaido University, AKIRA OHNISHI, YITP, Kyoto University — In constructing the dense matter equation of state (EOS), it is desired to respect both chiral symmetry and hypernuclear physics. In dense matter, strangeness is expected to play a decisive role and the partial restoration of chiral symmetry would modify the hadrons' properties. From the point of view of chiral symmetry, we have developed a chiral SU(2) symmetric RMF model with a logarithmic sigma potential, which is derived in the strong coupling limit (SCL) of the lattice QCD in zero temperature. In order to investigate hypernuclear systems, we have introduced an extended chiral SU(3) RMF model which includes both chiral symmetry and hypernuclear physics information. We determine hyperon-meson coupling constants in this chiral SU(3) RMF model by fitting existing data. The EOS of symmetric matter is found to be more softened than SCL model by the scalar meson with hidden strangeness, $\zeta = s\bar{s}$ and to be consistent with the EOS in a variational calculation at around ρ_0. At higher ρ_B, however, EOS is so soft that the calculated neutron star mass underestimates the observed value. In order to cure this problem, we have examined arcsinh type chiral potential which is derived in the finite temperature treatment of SCL. In this presentation, we discuss how to construct this chiral SU(3) RMF models and show an effect to nuclear star maximum mass by introducing this potential.

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