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Dense-matter and hypernuclear systems with an SU(3) chiral symmetric relativistic mean field model KOHSUKE TSUBAKIHARA, AKIRA OHNISHI, Hokkaido University — Hyperons are believed to play important roles in dense matter such as neutron star and supernovae. In studying hyperonic dense matter, we should invoke accumulated knowledges on hypernuclei. Relativistic Mean Field (RMF) models is one of the way to understand dense matter and hypernuclei consistently. In this model, it is possible to introduce symmetries directly. In order to reduce ambiguities further, we introduce chiral symmetry in RMF. However, we haven't succeeded in constructing satisfactory RMF Langrangian with chiral symmetry. For example, privious models have some shortcomings such as chiral symmetry restoration below normal nuclear density, too stiff EOS and so on. Last time, we have introduced SU(2) chiral symmetry to scaler meson self-interaction in RMF Lagrangian with the result of strong coupling limit lattice QCD as $U_\sigma^{SU(2)} = a \log \sigma^2 + b\sigma^2 + c_\sigma \sigma$, and shown that it works very well. EOS becomes softer than privious RMF models with chiral symmetry. We can also well explain the binding energies of normal nuclei and single Λ hypernuclei. Now, it is desireble to extend our model to that having SU(3) chiral symmetry. This extention enables us to get information of hyperons in hyperonic dense matter and hypernuclei from the bond energy of $\Lambda\Lambda$ in finite nueclei, $\Delta B_{\Lambda\Lambda}$ of ${}^{6}_{\Lambda\Lambda}$He. In this time, we'll report our recent results about single and double Λ hypernuclei and hyperonic dense matter.

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