Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Determination of the strength of vector interaction by Lattice QCD JUNPEI SUGANO, JUNICHI TAKAHASHI, MASAHIRO ISHII, Kyushu University, HIROAKI KOUNO, Saga University, MASANOBU YAHIRO, Kyushu University — Recently, Lattice QCD (LQCD) has become possible to provide the information of QCD phase diagram not only in the finite temperature(T) region but also in the finite quark chemical potential (μ_q) region. For small μ_q, say μ_q /T1, we can obtain the reliable physical quantities calculated by LQCD. However, it is still difficult to perform LQCD calculation in the large μ_q region, where physics such as neutron stars exists. On the other hand, the effective models allow us to analyze the large μ_q region. Especially, entanglement Polyakov-loop extended Nambu-Jona-Lasinio (EPNJL) model is useful one. But EPNJL model includes an ambiguity of the strength of vector interaction acting on quarks. This ambiguity should be eliminated by LQCD results. By using LQCD, quark number density is calculated in the μ_q /T1.2 region. Quark number density is sensitive to the strength of vector interaction, so we aim to determine the strength of vector interaction from the quark number density calculated by LQCD. In addition, we investigate whether our results are consistent with the observation of neutron stars with two solar mass.

Junpei Sugano
Kyushu University

Date submitted: 01 Jul 2014 Electronic form version 1.4