Compact Stars with a Dyon-Diquark Quark Model

I. Introduction

The possible appearance of quark matter (QM) is the location of meson-meson states (MS) and the hyperon-meson (f+) states. The quark model (QM) and nuclear matter (NM) are important quantum states in explaining QM. The value of the meson mass in NM is probably one of the physical quantities that are accurate enough in the QM. Unfortunately, the QM mass is poorly known in terms of mass and the high baryon density model for NM. The QM mass, therefore, only on the scale of QM, which is usually for the heavy meson QM. Thus, the QM may be compared with the model of QM, which makes a very small Baryon QM. We study the QM model with a baryon density independent (BID) quantum number and different quark sizes in the meson (BID model). We study the QM model with a baryon number independent (BID) quantum number and different quark sizes in the meson. We consider the QM model with a baryon density independent (BID) quantum number and different quark sizes in the meson. We study the QM model with a baryon density independent (BID) quantum number and different quark sizes in the meson.

II. Equation of State of Dense Matter

A. BID of hadronic matter within Brueckner theory

The Brueckner-Bethe-Goldstone theory is based on a local density expansion of the energy per unit of nuclear matter [2] (Chapter 1 and reference). The basic input parameters in the Brueckner-Bethe-Goldstone theory are the nuclear matter density (NM) and the hadron mass of NM. In this work, we study the interaction of quark matter with BID model and within the Brueckner-Bethe-Goldstone (BBG) many-body expansion of nuclear matter. Due to the importance of scattering processes and the need for a detailed understanding of the quark matter phase transitions, we study a detailed analysis of BID model and within the Brueckner-Bethe-Goldstone (BBG) many-body expansion of nuclear matter.

B. Quark Matter

We work in the formulation of QM in Brueckner space. The DE of the quark propagator reads

\[ \Delta(x^\mu - y^\mu, t) = \Delta_{LP}(x^\mu - y^\mu, t) + \int_0^{\Lambda_{QCD}} ds \Delta_{LP}(x^\mu - y^\mu, s) \Delta_{LP}(x^\mu - y^\mu, s - t) \]

where we defined gluon propagator and quark propagator vertices are used.

For the gluon propagator, we replace the familiar form with an infrared (IR) and ultraviolet (UV) cut-off.

\[ \Delta_{LP}(x^\mu - y^\mu, s) = \frac{1}{s^2 - m^2} \left( e^{-s/(\Lambda_{QCD})} - e^{-s/(2\Lambda_{QCD})} \right) \]

for the quark propagator, we replace the familiar form with an infrared (IR) and ultraviolet (UV) cut-off.

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where \( s = x^\mu - y^\mu \). The QM model is a kind of the IR cut-off in [11].

The BID of quark matter is given in Section 11.3. We suppose the quark model density and other non-thermodynamic quantities as

\[ n_q = \int_0^{\Lambda_{QCD}} ds \Delta_{LP}(x^\mu - y^\mu, s) \]

\[ f_q = \int_0^{\Lambda_{QCD}} ds \Delta_{LP}(x^\mu - y^\mu, s) \]

\[ f_{\mu\nu} = \int_0^{\Lambda_{QCD}} ds \Delta_{LP}(x^\mu - y^\mu, s) \]

\[ f_{\mu\nu\rho\sigma} = \int_0^{\Lambda_{QCD}} ds \Delta_{LP}(x^\mu - y^\mu, s) \]

This is the BID of quark matter.