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Departamentos de Física Teórica I y II
Universidad Complutense de Madrid

INVITADO: Fernando S. Navarra

Universidade de São Paulo, Brasil

TITULO: Self-bound Interacting QCD Matter in Compact Stars

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ABSTRACT

The quark gluon plasma (QGP) at zero temperature and high baryon number is a system that may be present inside compact stars. It is quite possible that this cold QGP shares some relevant features with the hot QGP observed in heavy ion collisions, being also a strongly interacting system. In a previous work we have derived from the QCD Lagrangian an equation of state (EOS) for the cold QGP, which can be considered an improved version of the MIT bag model EOS. Compared to the latter, our equation of state reaches higher values of the pressure at comparable baryon densities. This feature is due to perturbative corrections and also to non-perturbative effects.

Here we apply this EOS to the study of neutron stars, discussing the absolute stability of quark matter and computing the mass-radius relation for self-bound (strange) stars. The maximum masses of the sequences exceed two solar masses, in agreement with the recently measured values of the mass of the pulsar PSR J1614-2230, and the corresponding radii around 10-11 km.

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