

Title: Magnetized color flavor locked state and compact stars

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Abstract: The stability of the color flavor locked phase in the presence of a strong magnetic field is investigated within the phenomenological MIT bag model, taking into account the variation of the strange quark mass, the baryon density, the magnetic field, as well as the bag and gap parameters. It is found that the minimum value of the energy per baryon in a color flavor locked state at vanishing pressure is lower than the corresponding one for unpaired magnetized strange quark matter and, as the magnetic field increases, the energy per baryon decreases. This implies that magnetized colorflavor locked matter is more stable and could become the ground state inside neutron stars. The mass-radius relation for such stars is also studied.

KeyWords Plus: High-Density QCD; Neutron-Star; Quark Matter; Symmetry-Breaking; Superconductivity; Locking; Pulsar; Field; Gap

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