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Exact solutions of a model for strange stars with interacting quarks

The search for the true ground state of dense matter remains open since thestrange matter hypothesis was proposed by E. Witten in 1984. In this hypothesis the strange matter is assumed to be composed of u, d and s quarks, having an energy per baryon lower than that of quark matter (only u and d), and even than of the nuclear matter. In this sense, neutron stars would actually be strange stars. Later work showed that a color flavor locked (CFL) state would be preferred to the one without any pairing for a wide range of the parameters (gap Δ, strange quark mass m_s, and bag constant B). We use an approximate, yet very accurate CFL equation of state (EoS) to obtain exact solutions for the static Einstein Field Equations (EFE) that describe a compact relativistic object. A density profile and mass-radius relation are constructed.

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