Properties of H particle-admixed compact star

We explore the potential manifestation of a hexaquark, the H particle, as a constituent within neutron stars. The H particle, characterized by a quark composition of , is constructed using the framework of Chromomagnetic Interaction (CMI). Specifically, we contemplate the flavor-singlet state H with . Our computations indicate that the three-flavor hexaquark state, the H particle, possesses a lower mass of in comparison to the , implying greater stability than the two-flavor . The analysis involving the H particle is carried out using the relativistic mean-field (RMF) model. We investigate the influence of H particle couplings, a key factor in determining the system stability, and focus on the potential existence of H particle within neutron stars. We find that H particle could potentially endure as a stable constituent within neutron stars, and lead to a reduction of the maximum mass.

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