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Phase Structure in a Quark Mass Density-and-Temperature-Dependent Model

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Abstract: The phase diagram of bulk quark matter in equilibrium with a finite hadronic gas is studied. Different from previous investigations, we treat the quark phase with the quark mass density-and-temperature-dependent model to take the strong quark interaction into account, while the hadron phase is treated by hard core repulsion factor. It is found that the phase diagram in this model is, in several aspects, different from those in the conventional MIT bag model, especially at high temperature. The new phase diagram also has strong effects on the mass-radius relation of compact hybrid stars.

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