



Contribution ID: 783

Type: Poster

Modeling QCD phase diagram within chiral relativistic mean field model fitted to $\mu_B = 0$ lattice data

Tuesday, May 15, 2018 7:10 PM (30 minutes)

The SU(3) flavor parity-doublet quark-hadron model is used to investigate the phase diagram of QCD matter. The quark sector of the model is tuned to the $\mu_B = 0$ lattice QCD data on trace anomaly. The structure of the baryon number susceptibilities in the temperature/chemical potential plane is studied in some detail. The model predicts three phase transitions - nuclear first-order liquid-gas phase transition, chiral symmetry restoration, and deconfinement transition.

At $\mu_B = 0$, good agreement with the corresponding lattice data is obtained.

The deviations from the free hadron gas baseline in the crossover temperature region at $\mu_B = 0$ are mainly attributed to the leftover of the liquid-gas transition in nuclear matter, the chiral phase transition determines the baryon fluctuations at much higher μ_B , and at even higher baryon densities the behavior of fluctuations is controlled by deconfinement transition.

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Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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Session Classification: Poster Session

Track Classification: Phase diagram and search for the critical point