



Contribution ID: 783

Type: Poster

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

Tuesday, 15 May 2018 19:10 (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.

[1] J. Steinheimer, S. Schramm and H. Stoecker, J.Phys. G38, 035001 (2011)

doi:10.1088/0954-3899/38/3/035001 [arXiv:1009.5239 [hep-ph]].

[2] J. Steinheimer, S. Schramm and H. Stoecker, Phys. Rev. C 84, 045208 (2011)

doi:10.1103/PhysRevC.84.045208 [arXiv:1108.2596 [hep-ph]].

[3] A. Mukherjee, J. Steinheimer and S. Schramm, Phys. Rev. C 96, no. 2, 025205 (2017)

doi:10.1103/PhysRevC.96.025205 [arXiv:1611.10144 [nucl-th]].

[4] V. Vovchenko, L. Jiang, M. I. Gorenstein and H. Stoecker, arXiv:1711.07260 [nucl-th].

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

Primary author: Mr MOTORNENKO, Anton (Frankfurt Institute for Advanced Studies)

Co-authors: STOECKER, Horst (GSI); STEINHEIMER, Jan; SCHRAMM, Stefan; VOVCHENKO, Volodymyr (Frankfurt Institute for Advanced Studies)

Presenter: Mr MOTORNENKO, Anton (Frankfurt Institute for Advanced Studies)

Session Classification: Poster Session

Track Classification: Phase diagram and search for the critical point