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Type: 4th week (Nuclear matter under extreme conditions)

Four-dimensional equation of state of QCD matter with multiple chemical potentials

Thursday, November 7, 2024 12:00 PM (30 minutes)

Elucidation of the QCD phase structure is an important topic in particle and nuclear physics. We construct a four-dimensional equation of state as a function of the temperature and the chemical potentials of net baryon (B), charge (Q), and strangeness (S) for the QCD matter created in nuclear collisions [1]. Lattice QCD simulations and a hadron resonance gas model are considered for the construction. We also develop an efficient numerical method for applying the equation of state to relativistic hydrodynamic models, which can be used for analyses of the nuclear collisions at beam energy scan energies and of different nuclear species at the BNL Relativistic Heavy Ion Collider.

[1] A. Monnai, G. Pihan, B. Schenke, and C. Shen, arXiv:2406.11610 [nucl-th]

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