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Thermodynamics of baryon rich hadronic matter

Monday 7 August 2017 16:00 (30 minutes)

We study the thermodynamics of hadronic matter using
the hadron resonance gas model with repulsive interactions
between baryons. The repulsive interactions are modeled
using the mean field approach. We study higher order fluctuations
of baryon number and strangeness within this approach and compare
the calculations with the most recent lattice results.
We find that the repulsive mean field reduces the thermodynamic
properties as expected. More interestingly, however, we find that
the reduction is bigger for the higher order fluctuations,
in particular the repulsive mean field approach predicts
chi_4^B/chi_2^B (the ratio of the fourth to second order baryon number fluctuations)
should decrease close to Tc as seen on the lattice.
After validating the model through detailed comparison with the lattice
data we extend the study of thermodynamics in the baryon dense region with
muB>400 MeV, which is not accessible with current lattice calculations.

Summary

We study fluctuations of conserved charges and QCD thermodynamics at non-zero baryon density using hadron resonance gas model with repulsive interactions.

Author: PETRECZKY, Peter Petreczky (BNL)

Co-author: HUOVINEN, Pasi (University of Wroclaw)

Presenter: PETRECZKY, Peter Petreczky (BNL)

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