Contribution ID: **62** Type: **Talk**

Non-perturbative thermal QCD at very high temperatures

Friday, 2 August 2024 14:35 (20 minutes)

We discuss a recently introduced strategy to study non-perturbatively thermal QCD up to temperatures of the order of the electro-weak scale, combining step scaling techniques and shifted boundary conditions. The former allow to renormalize the theory for a range of scales which spans several orders of magnitude with a moderate computational cost. Shifted boundary conditions remove the need for the zero temperature subtraction in the Equation of State. As a consequence, the simulated lattices do not have to accommodate two very different scales, the pion mass and the temperature, at the very same spacing. Effective field theory arguments guarantee that finite volume effects can be kept under control safely.
The entire strategy has been implemented by discretizing fermions with the O(a)-improved Wilson–Dirac operator. This is a theoretically-sound regularization which enjoys de-facto automatic O(a)-improvement at high temperature. Several computations, carried out with the proposed strategy, are underway and will be presented in other (related) talks to this conference.

Primary authors: GIUSTI, Leonardo (University of Milano-Bicocca); BRESCIANI, Matteo (Università di Milano Bicocca); DALLA BRIDA, Mattia (DESY - Zeuthen); HARRIS, Tim (Helmholtz-Institut Mainz); LAUDICINA, Davide; PEPE, Michele (INFN - Sez. Milano Bicocca)

Presenter: GIUSTI, Leonardo (University of Milano-Bicocca)

Session Classification: QCD at non-zero temperature

Track Classification: QCD at Non-zero Temperature