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The Equation of State of QCD up to the Electro-Weak scale - part 2

Friday, 2 August 2024 15:15 (20 minutes)

In this talk we detail the non-perturbative computation of the entropy density in QCD with $N_f = 3$ massless $O(a)$ -improved Wilson fermions, in a temperature range from a few GeV up to the Electro-Weak scale. This contribution complements the companion talk (part 1) where the theoretical strategy and main results for determining the QCD Equation of State are reported. We formulate QCD in a moving reference frame, where the fields satisfy shifted boundary conditions along the temporal direction and periodic boundary conditions otherwise. In this setup the entropy density can be computed as the derivative of the free-energy density with respect to the shift. At each physical value of the temperature we simulate four lattice spacings and extrapolate the entropy density to the continuum limit, attaining a final accuracy of about 1 percent.

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