



Contribution ID: 154

Type: Poster

Chiral phase transition in $(2 + 1)$ -flavor QCD on $N_\tau = 6$ lattices

Tuesday, July 26, 2016 7:00 PM (1 hour)

We present updated studies of chiral phase transition in $N_f = 2 + 1$ QCD. Simulations have been performed with Highly Improved Staggered Quarks (HISQ) on lattices with temporal extent $N_\tau = 6$ at vanishing baryon chemical potential. We updated our previous study (1511.00553) by extending the temperature window from (140MeV, 150MeV) to (140MeV, 170MeV). The strange quark mass was chosen to its physical value m_s^{phys} , and five values of two degenerate light quark masses (m_l) are varied from $m_s^{phys}/80$ to $m_s^{phys}/20$ which correspond to a Goldstone pion mass ranging from 80 MeV to 160 MeV in the continuum limit.

The universal scaling behaviour of the QCD chiral phase transition is investigated by studying the temperature and quark mass dependence of chiral condensates and chiral susceptibilities. The window of criticality compared to previous studies is also discussed.

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Session Classification: Poster

Track Classification: Nonzero Temperature and Density