



Contribution ID: 181

Type: Talk

The QCD Phase Transition at the Physical Point with (2+1)-Flavor Möbius Domain Wall Fermions

We report recent results on the finite-temperature chiral phase transition in (2+1)-flavor QCD with physical quark masses, using the Möbius domain wall fermion (MDWF) action to preserve chiral symmetry to a high precision. Our simulations cover a temperature range from 140 to 250 MeV for two lattice spacings, corresponding to temporal extents of $N_t = 12$ and 16, with aspect ratios N_s/N_t between 3 and 4. This setup allows us to control for finite-volume and discretization effects. The chiral condensate for domain wall fermions contains ultraviolet-divergent contributions stemming from the finite input quark mass and residual chiral symmetry breaking. We will discuss our method for subtracting these contributions to obtain a renormalized chiral condensate. Our result shows that the disconnected chiral susceptibility develops a pronounced peak whose height does not increase with increasing volume. This suggests that the transition is a smooth crossover rather than first-order. We will report the pseudo-critical temperature and its dependence on the lattice spacing.

Parallel Session (for talks only)

QCD at nonzero temperature and density

Author: ZHANG, Yu (Bielefeld University)

Co-authors: FUKAYA, Hidenori (The University of Osaka); Dr KANAMORI, Issaku (R-CCS, RIKEN); GOSWAMI, Jishnu (Bielefeld University); HASHIMOTO, Shoji (KEK); AOKI, Yasumichi

Presenter: ZHANG, Yu (Bielefeld University)

Session Classification: QCD at nonzero temperature and density