



Contribution ID: 276

Type: **not specified**

Scaling behavior of chiral phase transition in two-flavor QCD with improved Wilson quarks at finite density

Tuesday, 15 June 2010 18:00 (5 minutes)

We study scaling behavior of a chiral order parameter defined by an axial Ward-Takahashi identity in two-flavor QCD. It has been shown that the scaling behavior of the chiral order parameter agrees with the scaling function of the three-dimensional $O(4)$ spin model by a simulation with the RG (Iwasaki) improved gauge action and clover improved quark action at zero chemical potential. We extend the scaling study to finite density QCD. Calculating derivatives of the chiral order parameter with respect to the chemical potential in two-flavor QCD with the improved Wilson quarks, we discuss the scaling property of chiral phase transition in the low density region.

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poster

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Session Classification: Poster session

Track Classification: Nonzero temperature and density