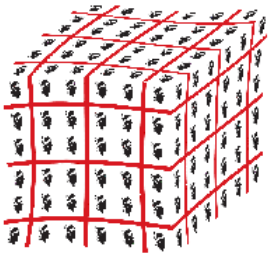

Contribution ID: **22** Type: **not specified**

Effective Potential and Phase Diagram in the Strong-Coupling Lattice QCD with Next-to-Next-to-Leading Order and Polyakov Loop Effects

Tuesday, 15 June 2010 17:20 (20 minutes)

Strong Coupling Lattice QCD (SC-LQCD) is a method directly based on QCD,
and has been applied to investigate the properties of the QCD phase diagram
in the finite chemical potential region. The previous studies in next-to-leading
order (NLO) evaluation assert that the effect of NLO in the effective potential
are renormalized in modification of the quark mass and chemical potential in the
strong coupling limit (SCL), and two order parameters (the chiral condensate and
density) are found to appear. These studies indicate the possibility
of the partially chiral restored phase as well.
In this study, we evaluate the effective potential in the
strong-coupling lattice QCD including next-to-next-to-leading order and Polyakov loop effects.
We also discuss the properties of the QCD phase diagram
by using the effective potential, including the critical temperature and the position of the
critical point. We find that the critical point is sensitive to the NNLO effects.
We also find that the critical temperature of the chiral phase transition is close to Monte Carlo
results due to Polyakov loop effects at \beta = 2Nc / g^2 ~ 4 and the critical temperature of the
chiral and deconfinement phase transition have almost the same values.

Please, insert your presentation type (talk, poster)

talk

Primary author: NAKANO, Takashi (Yukawa Institute of Theoretical Physics, Kyoto university)

Co-authors: Prof. OHNISHI, Akira (Yukawa Institute of Theoretical Physics, Kyoto university); Dr MIURA, Kohtaroh (INFN-Laboratori Nazionali de Frascati)

Presenter: NAKANO, Takashi (Yukawa Institute of Theoretical Physics, Kyoto university)

Session Classification: Parallel 28: Nonzero temperature and density

Track Classification: Nonzero temperature and density