



Contribution ID: 38

Type: **Poster**

Beating the sign problem in finite density lattice QCD

Wednesday, 15 July 2015 18:30 (2h 30m)

At finite density lattice QCD, the famous sign problem has prevented us from studying the QCD phase diagram based on the first-principle calculation. In order to circumvent the problem, we propose a method where we put new wine into old wineskins: i.e., we use an old idea, “canonical approach”, but put into it a new ingredient, multi-precision calculations. This is free from the usual limitation due to Taylor expansion.

We briefly present the history of the canonical partition function method, describe our formulation, and show outcomes of the first test, which are very promising and encourages us to go to the final stage, i.e., the study of the QCD under extreme conditions by realistic simulations at small quark masses and on large lattices.

Primary author: Prof. NAKAMURA, Atsushi (RCNP, Osaka Univ.)

Co-authors: Mr SUZUKI, Asobu (Tsukuba University); Dr NAGATA, Keitaro (KEK); Mr FUKUDA, Ryutarō (The University of Tokyo); Mr OKA, Shotaro (Rikkyo Univ.); Dr SAKAI, Shuntaro (Kyoto University); Dr TANIGUCHI, Yusuke (Tsukuba university)

Presenter: Prof. NAKAMURA, Atsushi (RCNP, Osaka Univ.)

Session Classification: Poster Session

Track Classification: Nonzero Temperature and Density