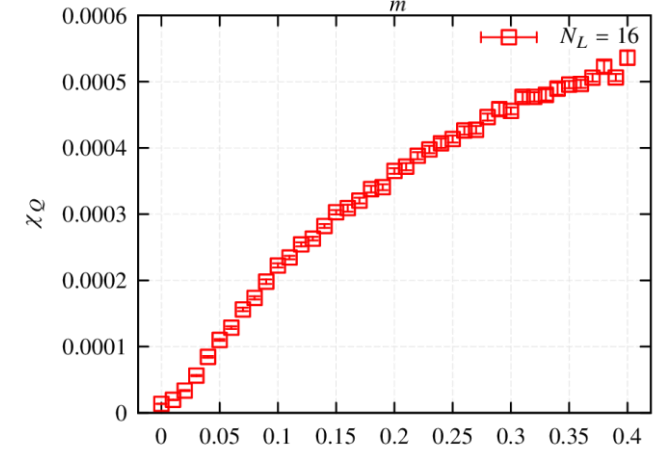
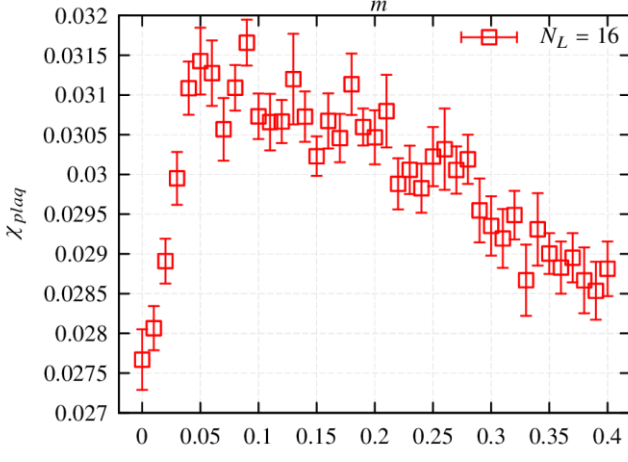
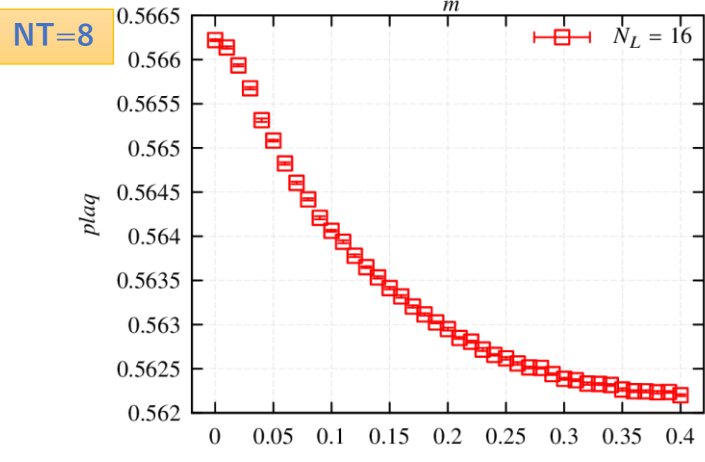
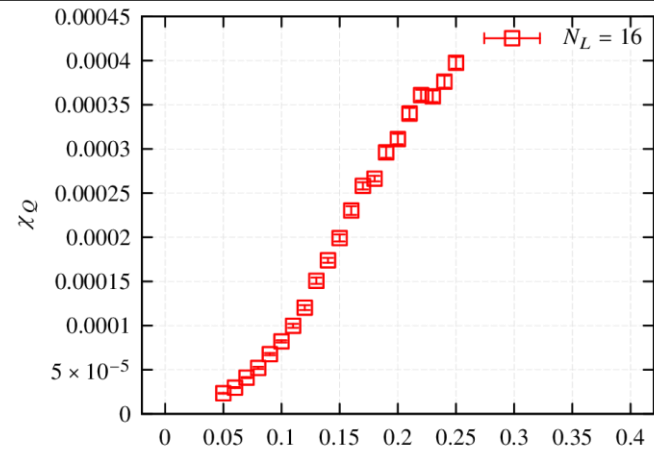
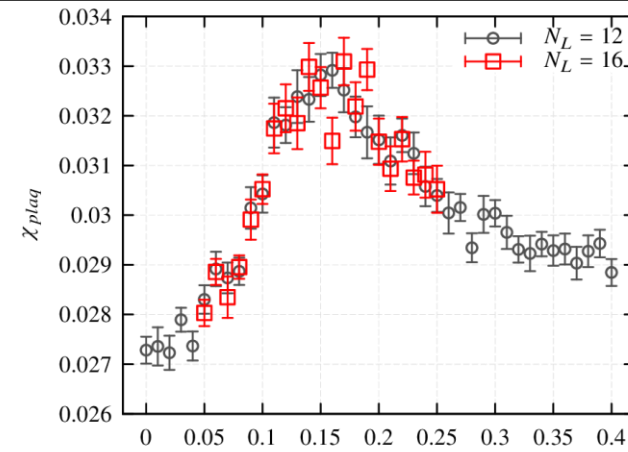
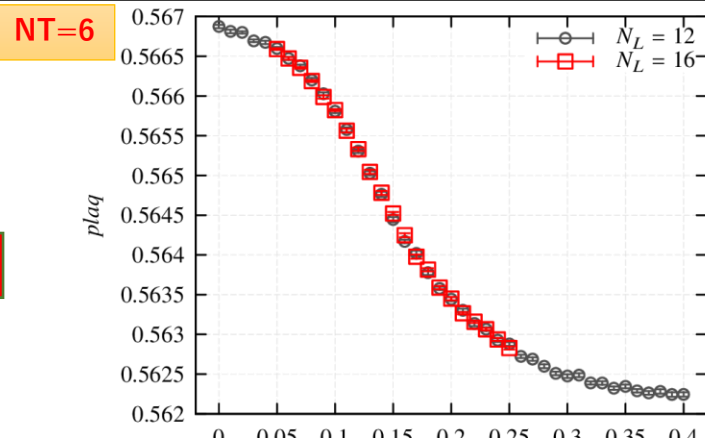
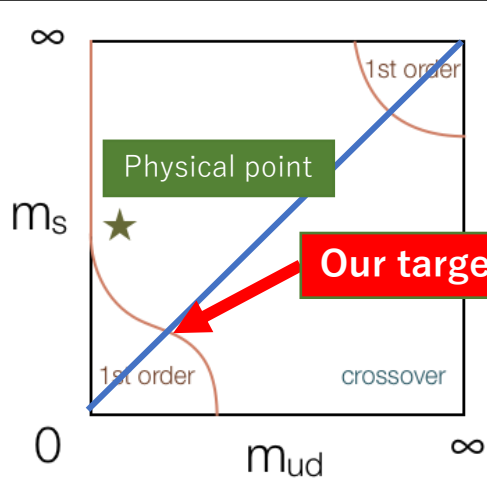


Finite temperature phase transition for three flavor QCD with Möbius-domain wall fermions

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Columbia plot : The nature of the finite temperature phase transition in 2+1 flavor QCD depends on the quark mass, and the order and universal class of the phase transition are shown.

Lattice setup

- Action
 - NF=3 MDWF with Ls=16
 - Symanzik gauge at $\beta=4.0$ ($1/a=1.4\sim 1.7\text{GeV}$)
- Size
 - NT=6: NL=12, 16
 - NT=8: NL=16
- Statistics : 100K traj for each
- Measurement
 - Plaquette
 - Topological charge

Summary

- We are studying the finite temperature phase transition for three flavor QCD with Möbius-domain wall fermions at NT=6 and 8, and measured plaquette and topological charge so far.
- We found a peak in the plaquette susceptibility at **NT=6, $\beta=4.0$, $m \sim 0.15$ (it seems to be a crossover)**, at **NT=8, $\beta=4.0$, $m \sim 0.1$ (larger spatial size studies are needed)**.
- We plan to do larger NT simulations, and measure fermionic observables.

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 This work used computational resources of the supercomputers Fugaku provided by RIKEN (Project ID: hp210032) and Ito at Kyushu University (hp200050 and hp190124) through the HPCI System Research Project. This work is supported in part of the JSPS KAKENHI grant No.20H01907.