

# Fluctuations of conserved charges in a background magnetic field

*Tuesday, 4 August 2020 16:20 (20 minutes)*

We will present results on the second order fluctuations of net baryon number, electric charge and strangeness as well as correlations among these conserved charges in (2+1)-flavor lattice QCD in the presence of a background magnetic field.

Simulations are performed using the tree level improved gauge action and the highly improved staggered quark

(HISQ) action with a fixed scale approach ( $a=0.117$  fm). The light quark mass is set to be 1/10 of the physical strange quark mass and the corresponding pion mass is about 220 MeV at vanishing magnetic field. At zero temperature the simulations are performed on  $32^3 \times 96$  lattices while at nonzero temperature on  $32^3 \times N_\tau$  lattices having six values of  $N_\tau$  varying from 16 to 6 corresponding to temperature ranging from 105 MeV to 280 MeV. The magnetic field strength  $eB$  is simulated with about 15 different values up to  $3.5 \text{ GeV}^2$  at each temperature. Chiral condensates and disconnected susceptibilities as a function of  $eB$  are also discussed.

**Primary author:** LI (\*), Sheng-Tai (Chinese Academy of Sciences (CAS) - Institute of Modern Physics (IMP) & Central China Normal University)

**Co-authors:** DING (CENTRAL CHINA NORMAL UNIVERSITY), Heng-Tong; WANG (CENTRAL CHINA NORMAL UNIVERSITY), Xiao-Dan; ZHANG (CENTRAL CHINA NORMAL UNIVERSITY), Yu; TOMIYA (RIKEN BNL RESEARCH CENTER, BROOKHAVEN NATIONAL LABORATORY), Akio

**Presenter:** LI (\*), Sheng-Tai (Chinese Academy of Sciences (CAS) - Institute of Modern Physics (IMP) & Central China Normal University)

**Session Classification:** QCD at nonzero Temperature and Density

**Track Classification:** QCD at nonzero Temperature and Density