The 38th International Symposium on Lattice Field Theory

LATTICE 21

JULY 26-30 2021, ZOOM/GATHER@MIT

Contribution ID: **380** Type: **Oral presentation**

Lattice QCD with an inhomogeneous magnetic field background

Wednesday 28 July 2021 13:45 (15 minutes)

In non-central heavy-ion collisions, the magnetic fields generated are stronger than any ground-based experiments, reaching magnitudes comparable to the strong scale and being highly non-uniform. To study such extreme conditions, we simulate the theory of strong interactions at finite temperature on the lattice, with staggered fermions and an inhomogeneous magnetic background. Just as in the homogeneous case, the magnetic flux is quantized. We calculate the inhomogeneous chiral condensate, susceptibility, Polyakov loop and estimate the size of lattice artifacts. We assume a $1/\cosh^2$ profile for the field, varying its width and amplitude to study the impact on the computed observables. We find that the condensate follows a similar profile as the magnetic field, being enhanced where the field is peaked and decreased towards the tails. These results might contribute to a better understanding of magnetic field-related effects in non-central heavy-ion collisions, as well as of the QCD phase transition

Primary author: MARQUES VALOIS, Adeilton Dean (University of Bielefeld)

Co-authors: Dr ENDRODI, Gergely (University Bielefeld); Dr BRANDT, Bastian (University Bielefeld); Dr CUTERI, Francesca (Goethe University Frankfurt); Dr MARKO, Gergely (University Bielefeld)

Presenter: MARQUES VALOIS, Adeilton Dean (University of Bielefeld)

Session Classification: QCD at nonzero Temperature and Density

Track Classification: QCD at nonzero Temperature and Density