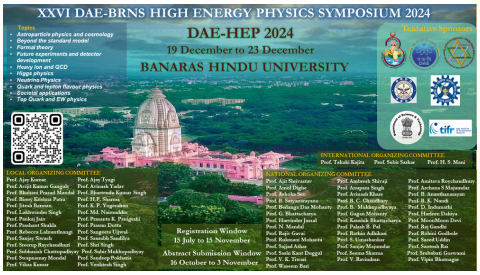

Contribution ID: **334** Type: **Oral**

Investigating the effect of magnetic field on baryon-charge correlations in Pb−Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV with ALICE

Correlations among net-conserved quantities such as net-baryon, net-charge, and net-strangeness play a crucial role in studying the QCD phase structure, as they are directly related to thermodynamic susceptibility ratios in lattice QCD (LQCD) calculations. Recent LQCD studies indicate a significant influence of the magnetic field (eB) on the susceptibility ratio associated with baryon-charge correlation, $\chi^{11}_{\rm BQ}/\chi^{2}_{\rm Q}$, highlighting the potential of using fluctuations and correlations of net-conserved charges to investigate the magnetic field produced in peripheral heavy-ion collisions. This presentation introduces new results focusing on correlation between net-charge and net-proton, with the net-proton serving as a proxy for the net-baryon number. The measurements are performed as a function of centrality in Pb–Pb collisions at 5.02 TeV using data recorded by the ALICE detector. Theoretical predictions from the Hadron Resonance Gas model (Thermal-FIST) without a magnetic field are compared with experimental results, to understand the influence of other dynamical factors leading to correlations, like resonance decays and conservation laws. The centrality dependence of the measured observable shows good alignment with the eB dependence predicted by LQCD, which also could not be explained by the no-magnetic-field Thermal-FIST model results.

Field of contribution

Experiment

Author: SAHA, Swati (National Institute of Science Education and Research (NISER) (IN))

Presenter: SAHA, Swati (National Institute of Science Education and Research (NISER) (IN))

Track Classification: Heavy ion and QCD