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Measuring flow harmonics up to order 10 and net-charge fluctuations in PbPb collisions with the CMS experiment

Tuesday 5 September 2023 11:40 (20 minutes)

This talk presents a measurement of higher order flow harmonics with order number up to 10 in lead-lead (PbPb) collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$~TeV, using data collected by the CMS experiment. Higher order flow harmonics probe the initial geometry of heavy ion collisions as well as the viscous damping of flow coefficients during the evolution of the quark-gluon plasma (QGP). By extending the study of flow harmonics to higher orders, we can access information about the QGP's transport properties that is complementary to existing measurements. In this talk, we will present the centrality dependence of flow harmonics up to order 10 and compare them to theory calculations and previous measurements at lower orders. Additionally, we will report the net-charge fluctuations with a pseudorapidity separation up to $\Delta\eta$ = 4.8 in PbPb collisions. All the results presented here provide new precision in probing the sensitivity of initial-state fluctuations and viscosity of the QGP, and deepen our understanding of the collective behavior of the strongly interacting matter.

Category

Experiment

Collaboration (if applicable)

CMS

Primary author: TUO, Shengquan (Vanderbilt University (US))

Presenter: TUO, Shengquan (Vanderbilt University (US))

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