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Production and collective flow measurement of charm strange mesons in heavy ion collisions at 5.02 TeV with CMS experiment

The interaction of heavy quarks with the quark-gluon plasma (QGP) significantly influences their azimuthal distribution and transverse momentum (p_T) spectra. Consequently, azimuthal anisotropy coefficients (v_n) and nuclear modification factors (R_{AA}) of heavy flavor hadrons serve as essential observables for probing QGP properties. This talk presents the first measurements of the elliptic (v_2) and triangular (v_3) flow coefficients of D_s^\pm mesons in lead-lead (PbPb) collisions at a center-of-mass energy of 5.02 TeV, recorded by the CMS experiment. These measurements are performed as a function of transverse momentum across various centrality classes, with significantly improved precision. The broad kinematic coverage and direct comparison with non-strange D mesons offer critical insights into different charm quark flow mechanisms. Moreover, the first-ever measurement of the v_3 coefficient for D_s^\pm mesons enables the exploration of initial-state fluctuations. Additionally, spectra and nuclear modification factors (R_{AA}) for both prompt and non-prompt D^0 mesons in PbPb collisions will be presented, with comparisons to theoretical models.

Field of contribution

Experiment

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