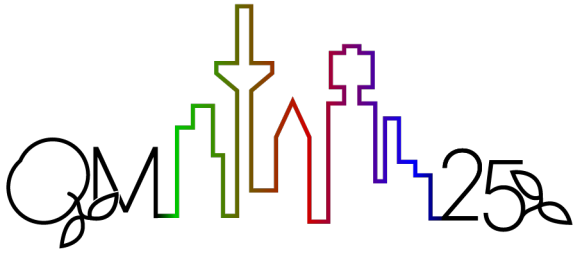

Contribution ID: **207** Type: **Poster**

Azimuthal correlations of D_s^+ mesons with charged particles with the ALICE experiment

The azimuthal correlations of D_s^+ mesons with charged particles in high-energy proton-proton (pp) collisions offer a powerful tool for investigating charm-quark production and hadronization mechanisms. By measuring the azimuthal-angle distribution between the direction of the tagged D_s^+ meson and those of the other charm hadronization products, it is possible to perform a multi-differential characterization of the charm hadronization process and obtain ininsight into the charm-jet structure. Compared to studies involving non-strange D mesons, the measurement of the D_s^+ meson allows us to explore a potential influence of strangeness on the charm hadronization process. Additionally, measurements in pp collisions serve as a reference for interpreting results from proton-nucleus (p–Pb) and nucleus-nucleus (Pb–Pb) collisions.
In Pb–Pb collisions, a Quark-Gluon Plasma (QGP) state is produced. Since charm quarks are produced in the early stages of the collision, before the QGP formation, they interact with the medium constituents through radiative and collisional processes, resulting in energy loss and modification of their original direction. As a result, sizable modifications to azimuthal correlation distributions are expected.
In this contribution, the azimuthal correlation distribution of prompt D_s^+ mesons with charged particles measured using data collected by ALICE during Run 3 at the LHC will be presented. D_s^+ mesons in the transverse momentum range of $3 < p_{\mathrm{T}}(D_s^+) < 36$ GeV/c, reconstructed at midrapidity, are correlated with charged particles selected in different intervals of transverse momentum and $|\eta| < 0.8$. Quantitative information on the correlation pattern is obtained by measuring observables such as the integral and the widths of the correlation peaks. The results obtained from proton-proton collisions at $\sqrt{s}$ = 13.6 TeV will be presented and compared to state-of-the-art model predictions. Performance obtained from the analysis of the Pb–Pb data at $\sqrt{s}$ = 5.36 TeV will be also shown.

Category

Experiment

Collaboration (if applicable)

ALICE

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Session Classification: Poster session 2

Track Classification: Heavy flavor & quarkonia