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Study of charm quark hadronization via Λ_c^+ and D_s^+ production in the CMS experiment

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Measurements of the lightest open-charm baryon, Λ_c^+ , production can provide important information about the quark coalescence process of hadronization in the quark-gluon plasma (QGP). With strange quark yields being enhanced in the presence of the QGP medium, the production of D_s^+ is expected to be enhanced in heavy ion collisions if recombination plays an important role in the hadronization process. The high-luminosity data sets collected by the CMS experiment in 2018 have been used to measure Λ_c^+ production via $\Lambda_c^+ \rightarrow p^+ K^- \pi^+$ in the p_T range 3–30 GeV /c for pp collisions and 6–40 GeV /c for PbPb collisions in different centrality classes. The D_s^+ production is measured via the decay channel $D_s^+ \rightarrow \phi \pi^+ \rightarrow K^+ K^- \pi^+$ in the p_T range 2–40 GeV /c in pp collisions and 6–40 GeV /c in PbPb collisions using the data sets collected by CMS detector in 2015. Results of the differential cross section of Λ_c^+ and D_s^+ , the ratios of Λ_c^+ and D_s^+ over D^0 yields in pp and PbPb collisions will be presented along with the nuclear modification factors.

Experiment/Theory

CMS

Affiliation

CMS

Primary authors: CHANDRA, Soumik (PhD Student); STOJANOVIC, Milan

Vortragende: CHANDRA, Soumik (PhD Student); STOJANOVIC, Milan

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