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Λ_c^+ production in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV at the STAR experiment

Charm quarks, predominantly produced in the early stage of heavy-ion collisions, are believed to provide unique information on the hot and dense medium created in such collisions. At RHIC, an enhancement in baryon-to-meson ratios for light hadrons and hadrons containing strange quarks has been observed in central heavy-ion collisions compared to p+p and peripheral heavy-ion collisions in the intermediate p_T range (2 < p_T < 6 GeV/c). This was explained by the hadronization mechanism involving multi-parton coalescence. Λ_c^+ is the lightest charmed baryon with the mass close to D^0 meson, and it has an extremely short life time ($c\tau \sim 60\ \mu m$). Different models predict different levels of enhancement in the Λ_c^+/D^0 ratio depending on the degree of charm quark thermalization in the medium and how the coalescence mechanism is implemented.

In this poster, we will report the first measurement of Λ_c^+ production in heavy-ion collisions using the recently installed Heavy Flavor Tracker at STAR. Λ_c^+ are reconstructed through the hadronic decay channel ($\Lambda_c^+ \rightarrow pK\pi$) using topological cuts optimized by the Toolkit for Multivariate Data Analysis (TMVA). After correcting for the reconstruction efficiency and acceptance, the transverse-momentum spectrum of Λ_c^+ in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV will be presented. The measured Λ_c^+/D^0 ratio will be compared with different model calculations, and the physics implications will be discussed.

Preferred Track

Open Heavy Flavors

Collaboration

STAR

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