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Centrality and Transverse Momentum Dependences of D0-meson and D±-meson Production at Mid-rapidity in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV at STAR

Tuesday, May 15, 2018 7:10 PM (30 minutes)

Due to their large masses, heavy quarks are considered to be an excellent probe to study the properties of the quark gluon plasma through their interactions with the medium. In this presentation, we report on improved measurements, achieved by using supervised machine learning technique, of D^0-meson and $D^{\pm}$-meson transverse momentum ($p_{\rm T}$) spectra at mid-rapidity ($|y|$ <1) in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 200 GeV. The data were taken in 2014 by the STAR experiment with the Heavy Flavor Tracker, a high resolution silicon vertex detector. D^0 and $D^{\pm}$ mesons are measured through their hadronic decay channels, $D^0 \rightarrow K^- + \pi^+$ and $D^{\pm} \rightarrow K^{\mp} + \pi^{\pm} + \pi^{\pm}$, via topological reconstruction of the secondary decay vertices. After being corrected for the detector acceptance, tracking and topological cut efficiencies, invariant yields of D^0 and $D^{\pm}$ mesons are presented in various centrality intervals covering a wide transverse momentum region ($0 < p_T < 10$ GeV/c). The charmed hadron freeze-out properties and radial collectivity are discussed within the Blast-Wave model. Nuclear modification factors ($R_{\rm CP}$, $R_{\rm AA}$) in various centrality bins are calculated and compared to phenomenological model calculations.

Content type

Experiment

Collaboration

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Centralised submission by Collaboration

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