Measurement of D^0 production in d+Au collisions at $\sqrt{s_{NN}} = 200$ GeV by the STAR experiment

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Owing to their large mass, charm quarks are predominantly produced through initial hard scatterings in heavy-ion collisions. Therefore, they can serve as penetrating probes to study the intrinsic properties of the hot medium created in heavy-ion collisions. However, Cold Nuclear Matter (CNM) effects can also affect the charm quark production in nuclear collisions with respect to p+p collisions. These effects can be measured in small systems such as d+Au collisions.

In this poster, we will report the first measurement of D^0 production in d+Au collisions at $\sqrt{s_{NN}} = 200$ GeV by the STAR experiment taking advantage of its high-precision Heavy Flavor Tracker detector. $D^0(\overline{D^0})$ mesons were topologically reconstructed from their hadronic decay channel $D^0(\overline{D^0}) \rightarrow K^-\pi^+(K^+\pi^-)$. In order to further improve the signal significance, a supervised machine learning algorithm (Boosted Decision Trees) was used. The nuclear modification factor of the D^0 meson was extracted to quantify the CNM effects and compared to model calculations.