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D^0 Production in Au+Au Collisions at $\sqrt{}$sNN = 200 GeV at STAR

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— The mass of charm quarks is larger than the scales of the medium created in heavy-ion collisions at RHIC energies ($m_c >> \Lambda_{QCD}$,T,$m_{u,d,s}$). This makes their production mainly feasible in the primordial nucleon-nucleon collisions, therefore, their final kinematics provide unique information on their interaction with the hot and dense medium produced in the early stages of heavy-ion collisions. Recent measurements of D0 nuclear modification factors shed light on the intricate interplay of Cold Nuclear Matter effects, hadronization mechanisms and energy loss of charm quarks in heavy-ion collisions. In this presentation, we will report D0 topological reconstruction via its golden hadronic decay channel (D0$\rightarrow$Kπ) using STAR's recently installed Heavy Flavor Tracker (HFT) for reconstruction of secondary vertices. We will discuss studies of: HFT tracking efficiency from both data and simulation, D0 background reconstruction techniques, and the optimizations of D0 cuts using TMVA toolkit. The transverse-momentum and centrality dependence of D0 production in Au+Au Collisions at 200 GeV will be presented. We will also discuss nuclear modification factors and their comparison with published data from RHIC and the LHC and finally compare the results with models.

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