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Overview of charm production at RHIC

Yifei Zhang[a]

[a]University of Science and Technology of China,
Hefei, Anhui 230026, P.R.China *yfzhang3@mail.ustc.edu.cn*

Charm quarks are a unique tool to probe the hot-dense partonic matter created in relativistic heavy-ion collisions at RHIC energies. Charm quarks are believed to be produced only in the early stages and their production rate is reliably calculable by perturbative QCD. Studies of the binary collision (N_{bin}) scaling of the total charm cross-section can be used to test theoretical calculations and determine if charm is indeed a good probe with well-defined initial states. Measurements of charm production at low p_T, in particular radial and elliptic flow, probe the QCD medium and are thus sensitive to bulk medium properties like density and the drag constant or viscosity. And charm flow properties may help understand the light flavor thermalization.

In this talk, we report the recent measurements of D-mesons reconstruction through several hadronic decay channels and leptons from heavy flavor semileptonic decays at RHIC. The significant information of charm cross-sections and flow properties extracted from these measurements are presented. The e-h and e-D correlations for the estimation of bottom contributions in non-photonic electron measurements are also discussed.