QUARK MATTER 2015
Sep. 27 – Oct. 3, 2015 Kobe, Japan

Contribution ID: **523** Type: **Contributed talk**

Nuclear Modification Factors of D Meson Production in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV

Monday, 28 September 2015 15:10 (20 minutes)

The mass of charm quarks is larger than the scales of the medium created in heavy-ion collisions at RHIC energies (m_c » Λ_{QCD}, T, m_{u,d,s}). Therefore, charm production is mainly feasible in the primordial nucleon-nucleon collisions and experience all the subsequent stages of the medium evolution. The modification of charm quark production in heavy -ion collisions and signatures of their interactions with the created medium are imprinted on the final kinematics of charmed mesons which can be studied experimentally using Nuclear Modification Factors (NMFs). Recent measurement of D⁰ NMFs has shown rich enhancement and suppression structures in different transverse-momentum regions that shed light on the intricate interplay of Cold Nuclear Matter effects, collectivity with the bulk matter, hadronization mechanisms and energy loss of charm quarks in heavy-ion collisions. Higher precision measurements of NMFs are instrumental for accurately delineating the roles of these different mechanisms, their system size and kinematics dependencies, and can ultimately help in extracting medium parameters.

To this end, we will discuss the topological reconstruction of D mesons via their hadronic decay channels (D⁰ ⟶ Kπ, D^{+/-}⟶ K π π and D^{*+/-} ⟶D⁰ π ⟶ K π π) utilizing STAR's recently installed Heavy Flavor Tracker for secondary vertex identification. We will also discuss transverse-momentum and centrality dependence of D meson productions and NMFs and compare them with published data from RHIC and the LHC experiments as well as with model calculations for heavy quark production and energy loss in heavy -ion collisions.

On behalf of collaboration:

STAR

Primary author: XIE, Guannan (LBNL/USTC)

Presenter: XIE, Guannan (LBNL/USTC)

Session Classification: Open Heavy Flavors and Strangeness II

Track Classification: Open Heavy Flavors and Strangeness