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Measurements of open bottom hadron production via displaced J/ψ, D^0 and electrons in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}}$ = 200 GeV at STAR

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Recent RHIC and LHC results show that the nuclear modification factors of open charm hadrons at high transverse momenta as well as their elliptic flow are similar to those of light flavor hadrons, indicating that charm quarks also interact very strongly with the Quark Gluon Plasma (QGP). During interactions, charm quarks suffer from substantial energy loss and gain significant elliptic flow. It is then imperative to measure bottom production in heavy-ion collisions to study the mass dependence of parton-medium interactions in the QGP suggested by QCD.

In this talk, we will report on STAR measurements of open bottom hadron production through their displaced decay daughters ($B \to J/\Psi$, D^0, e) in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}}$ = 200 GeV. These measurements are made possible with the high-precision vertexing and tracking provided by the Heavy Flavor Tracker. With a factor of 2 times more data recorded in year 2016 and a successful implementation of a supervised machine learning method in offline reconstruction, signal precisions of non-prompt D^0 from bottom hadron decays are greatly improved compared to previous preliminary results. Centrality dependence of nuclear modification factors for non-prompt D^0 will be presented. These new results will be compared to those of open charm hadrons at RHIC and those of open charm and bottom hadrons at the LHC as well as to theoretical calculations. Physics implications will be discussed.

Summary

Author: Mr CHEN, Xiaolong (University of Science and Technology of China and Lawrence Berkeley National Laboratory)

Presenter: Mr CHEN, Xiaolong (University of Science and Technology of China and Lawrence Berkeley National Laboratory)

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