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Measurements of electron production from heavy flavor decays in p+p and Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV with the STAR experiment

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Heavy quarks are predominantly produced at the early stages of relativistic heavy-ion collisions before the formation of the quark-gluon plasma (QGP) medium. Heavy quarks subsequently traverse the QGP throughout its whole evolution, and thus are suggested as excellent probes to study the properties of the QGP. Theory predicts heavy quarks lose less energy than light quarks through gluon radiation. Measurements of the production of electrons from open heavy flavor hadron decays (Heavy Flavor decayed Electron, HFE), in p+p and Au+Au collisions and the nuclear modification factor, R_{AA} , of HFE provide valuable tool to understand the interactions of heavy quarks with the QGP medium. Furthermore, measurements of the HFE R_{AA} can be combined with separate measurements of the open bottom decayed electron fraction in HFE to evaluate the R_{AA} of open bottom decayed and open charm decayed electrons and investigate the mass hierarchy of parton energy loss in the QGP.

In this talk, we will present the new results of HFE production in p+p collisions at $\sqrt{s} = 200$ GeV from the STAR experiment with significantly improved precision compared to the previous measurements. We will also report measurements of the nuclear modification factor, R_{AA} , for HFE production in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV.

Collaboration (if applicable)

STAR

Track

Heavy Flavor and Quarkonia

Contribution type

Contributed Talk

Author: STAR COLLABORATION

Presenter: ZHOU, Yingjie (Central China Normal University CCNU (CN))

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