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Measurements of Charm and Bottom Productions in Semi-leptonic Channels at STAR

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Heavy flavor quarks are suggested as excellent probes to study the strongly interacting Quark-Gluon Plasma (QGP) created in high-energy heavy-ion collisions. Measurements of Non-Photonic Electron (NPE) production from open heavy flavor hadron decays have revealed strong suppression at large transverse momentum in Au+Au collisions relative to p+p collisions at the Relativistic Heavy Ion Collider (RHIC). Such suppression has been attributed to energy losses of heavy flavor quarks within the QGP. Theoretical predictions that are able to describe existing NPE data suggest that bottom quarks lose less energy than charm quarks, but it varies among models how exactly they differ. Therefore it is important to experimentally constrain such model calculations, which can further improve our understanding of parton interactions with the QGP and the QGP properties. Electrons from bottom hadron decays can be statistically separated thanks to the long lifetime of the bottom hadrons by comparison of the impact parameter distributions.

In this poster, we will present a first attempt to separately measure charm and bottom quark productions through semi-leptonic channels in Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV at RHIC, utilizing the new Heavy Flavor Tracker of the STAR experiment.

On behalf of collaboration:

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