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Nuclear modification factors, directed and elliptic flow of electrons from open heavy flavor decays in Au+Au collisions from STAR

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Measurements of nuclear modification factors (RAA) and elliptic flow (v2) for open heavy flavor hadrons are essential probes of the Quark Gluon Plasma produced in heavy-ion collisions. Single electrons from semi-leptonic decays are an excellent channel to study open heavy flavor due to their large branching fractions and triggering possibilities. Additionally, semi-leptonic c-hadron decays can provide a complimentary measurement of charm hadron directed flow (v1).
In this talk we will present the analyses of single electrons from semi-leptonic b- and c- hadron decays at mid-rapidity in sNN = 200, 54.4, and 27 GeV Au+Au collisions. The data at sNN = 200 GeV incorporate the Heavy Flavor Tracker which enables the topological separation of electrons originating from b- and c-hadron decays. We will report the first STAR measurements at sNN = 200 GeV of v2 for bottom-decayed electrons as a function of pT and v1 for charm-decayed electrons as a function of electron rapidity. Additionally, improved measurements of RAA and a new measurement of the double ratio of RCP between bottom- and charm-decayed electrons will be presented as a function of pT and centrality. We will also present the measurement of non-photonic electron v2 in sNN = 54.4 and 27 GeV data, collected during the 2017 and 2018 RHIC runs. These data samples contain roughly an order of magnitude more statistics than the previous STAR analysis at sNN = 62.4 GeV, which allows a more precise measurement of v2 for electrons from heavy flavor hadron decays at lower energies. Our data will be compared to theoretical models and implications will be discussed.

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