Nuclear modification factors, directed and elliptic flow of electrons from open heavy flavor decays in 200 GeV Au+Au collisions from STAR

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Measurements of nuclear modification factors (R_{AA}) and elliptic flow (v_2) for open bottom hadrons are essential probes of the Quark Gluon Plasma produced in heavy-ion collisions. However, exclusive open bottom hadron measurements have yet to be established at RHIC due to the small production cross-section. Electrons from semileptonic decays are excellent for open bottom measurements due to their large branching fractions and triggering possibilities. Additionally, semileptonic c-hadron decays can provide a complimentary measurement of charm hadron directed flow (v_1) and probe the difference of v_1 between hadrons with c and $\bar{c}$ quarks with better precision, the latter of which can arise from the initial strong magnetic field produced in the heavy-ion collisions.

In this talk we will present the analyses of single electrons from semileptonic b- and c-hadron decays at mid-rapidity in $\sqrt{s_{NN}} = 200$ GeV Au+Au collisions using data collected during the 2014 and 2016 RHIC runs by the STAR experiment. These data incorporate the Heavy Flavor Tracker which enables the topological separation of electrons originating from b- and c-hadron decays. We will report on the first STAR measurements of v_2 for bottom-decayed electrons as a function of electron p_{T} and v_1 for charm-decayed electrons as a function of electron rapidity. Additionally, improved measurements of R_{AA} for bottom-decayed electrons and charm-decayed electrons, and a new measurement of the double ratio of central-to-peripheral modification factors (R_{CP}) between bottom- and charm-decayed electrons will be presented as a function of electron p_{T} and centrality. Our data will be compared to theoretical models and implications will be discussed.