

Data-driven isolation for charm and beauty decay electrons at RHIC and LHC

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Heavy quarks (charm and beauty) are considered ideal probes for the properties of the Quark-Gluon Plasma (QGP) created in heavy-ion collisions. Due to the large mass, they are produced in hard scattering processes at the early stage of the collisions before the QGP, so they can experience the whole evolution of the system. Theoretical partonic energy loss in the QGP shows mass-dependent due to the suppression of the gluon radiation angle by the partonic mass. Also, partons with larger mass could be more difficult to achieve thermalization and follow the collective flow in the hot-dense medium. Because of its three times larger mass compared with the charm mass, beauty could have different properties in terms of its interactions with the QGP medium from charm.

We develop a data-driven method to isolate charm and beauty contributions from the inclusive heavy flavor electrons based on recent open charm hadron measurements at RHIC and LHC. The individual electron transverse momentum (p_T) spectra, nuclear modification factors (R_{AA}) and elliptic flows (v_2) from charm and beauty decays will be reported. Comparisons of the charm and beauty behaviors at RHIC and LHC energies will be given.

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