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D0-Hadron Correlations in Azimuth and Pseudorapidity in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV

Two-particle correlations have been shown to be sensitive to the dynamics of heavy-ion collisions. In particular, angular correlations on relative azimuth and pseudorapidity provide novel information about jet-like and collective behavior in these collisions. They also provide independent measures of important physical quantities, such as the second-order harmonic coefficient (v_2), by separating the quadrupole contribution (related to v_2) from η-dependent contributions such as those coming from jets and jet quenching. These correlations have already been measured for both unidentified and identified light-flavor hadrons. Heavy flavor (HF) quarks (e.g. charm, bottom) are new and ideal probes of these dynamics because they are predominantly formed in the early stage of the collisions, and therefore can be used to study the entire evolution of the hot and dense medium formed by such collisions.

We present here measurements of D^0-hadron angular correlations in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV from the Solenoidal Tracker at RHIC (STAR) experiment. The D^0 meson is reconstructed via its hadronic decay channel using the Heavy Flavor Tracker (HFT). The correlation structures will be shown as a function of both centrality and D^0 meson transverse momentum, and compared to the correlations for light-flavor hadrons. Using these measurements we will be able to extract physical quantities, such as v_2, and compare these values to model predictions and to results from other experimental methods.

Preferred Track

Correlations and Fluctuations

Collaboration

STAR

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