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Measurement of D^0 Meson Production and Azimuthal Anisotropy in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV in STAR

Saturday 24 September 2016 08:30 (20 minutes)

Since the charm-quark mass is larger than the thermal scales of the medium created in heavy-ion collisions at RHIC energies, charm quarks are believed to be mainly produced through the initial hard scatterings. Therefore, they experience the entire evolution of the hot and dense medium. Charm quarks are also expected to thermalize slower with the medium than light flavor quarks, which is sensitive to the transport properties of the medium. Thus the modification of D^0 meson transverse momentum spectrum in heavy-ion collisions and its azimuthal anisotropy can provide new insight to the properties of the hot nuclear medium and its evolution.

Recently, STAR has successfully installed and collected data with the Heavy Flavor Tracker, which, with the power of two layers of Monolithic Active Pixel Sensors (MAPS), achieves a pointing resolution of less than 50 μm for kaons with momentum of 750 MeV/c. With this performance STAR is able to carry out high precision D^0 measurements in a wide momentum range.

In this presentation, we will report our latest studies of D^0 meson via topological reconstruction in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. The production yield and nuclear modification factor for D^0 in central collisions, as well as its azimuthal anisotropy (v_2) in minimum bias collisions will be presented. We will also compare our results with theoretical calculations with different implementations of charm-medium interactions and medium evolution.

Summary

Presentation type

Oral

Author: GUANNAN, Xie (LBNL/USTC)

Presenter: GUANNAN, Xie (LBNL/USTC)

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