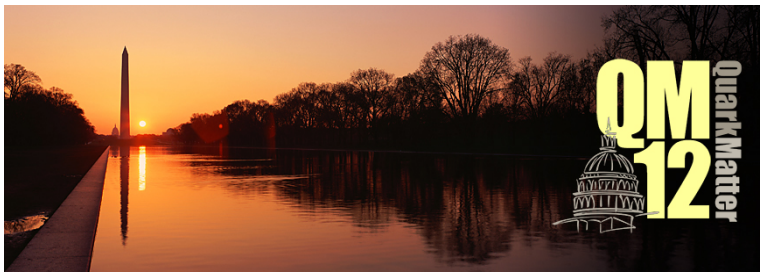

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Open charm hadron production in p+p and Au+Au collisions at STAR

Friday, 17 August 2012 14:20 (20 minutes)

In relativistic heavy ion collisions at RHIC, heavy quarks are expected to be created from initial hard scatterings. Their large masses are not easily affected by the strong interaction with QCD medium, thus they carry clean information from the system at early stage. The interaction between heavy quarks and the medium is sensitive to the medium dynamics, therefore heavy quarks are suggested as an ideal probe to quantify the properties of the strongly interacting QCD matter.
In this talk, we will present the STAR results of open charm hadron production at mid-rapidity in $p+p$ and Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. Open charm mesons were reconstructed directly via hadronic decay channels with daughter particles identified by TPC and TOF detectors. With abundant statistics of Au+Au collisions collected by STAR in the year 2010 and 2011, the D-meson is measured at p_T from 0.2 to 8 GeV in minimum bias Au+Au collisions. The centrality dependence of D-meson p_T spectra as well as the nuclear modification factor will be presented. A first measurement of the D^0 elliptic flow in 200 GeV Au+Au collisions will be reported. These measurements are compared to theoretical model calculations and physics implications will be discussed. Finally, we will discuss the open charm hadron measurement in $\sqrt{s} = 500$ GeV $p+p$ collisions to study the energy dependence of charm production.

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