

## Open charm hadron measurement in pp and Au+Au collisions at $\sqrt{s} = 200$ GeV in STAR

*Friday, 27 May 2011 16:00 (20 minutes)*

Heavy quark production in elementary particle collisions are expected to be calculable in pQCD. In relativistic heavy ion collisions, heavy quarks are believed to be an ideal probe to study the properties of the created QCD medium. Early RHIC measurements were carried out mostly via semi-leptonic decay electrons. There are limitations in the electron approach: the charm hadron and electron kinematics are only weakly correlated due to the decay, and measured electrons have mixed contributions from various charm/bottom hadrons. Thus direct measurement of charm hadrons via hadronic decays is crucial to better understand charm-medium interactions at RHIC.

In this talk, we will present the STAR preliminary results of D0 and D\* in year 2009 p+p and D0 in year 2010 Au+Au collisions via hadronic decays covering  $p_T$  from 0.4 to 6 GeV/c in mid-rapidity  $|y| < 1$  at  $\sqrt{s_{NN}} = 200$  GeV. Newly completed full barrel Time-Of-Flight detector was used in the analysis to improve the daughter hadron identification. The charm production  $p_T$  cross section in p+p collisions will be compared with pQCD calculations. The nuclear modification factors as a function of the collision centrality will be presented to discuss the number of binary collisions scaling of charm total cross-section. The behavior of D-meson freeze-out properties in Au+Au collisions will be compared with those of light and multi-strange hadrons. Preliminary results of the D0 decay vertex reconstruction in Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV from RHIC year 2007 using the silicon detectors of the STAR experiment will also be presented.

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