
Contribution ID: **118** Type: **Talk**

# Open charm measurements in $p + p$ collisions at STAR

*Thursday 25 July 2013 14:40 (20 minutes)*

Heavy quarks are expected to be created from initial hard scatterings. Due to their large masses, their production can be described by perturbative QCD. The charm production cross section measurement in $p + p$ collisions provides an important baseline to further exploring the QCD medium. At STAR, charm quarks are measured through Open Charm Mesons and Non-photonic Electrons (electrons from semi-leptonic decays of charmed and bottom hadrons, NPE) production analysis.

In this talk, we will present the STAR results of open charm hadron and NPE productions at mid-rapidity in $p+p$ collisions at $\sqrt{s}$ = 200 and 500 GeV. Open charm mesons were reconstructed directly via hadronic decay channels with daughter particles identified by STAR Time Projection Chamber (TPC) and Time Of Flight (TOF) detectors and NPE yields were calculated by subtracting photonics electrons from inclusive electrons identified by TPC and Electromagnetic Calorimeter. These measurements are compared to theoretical model calculations and physics implications will be discussed.

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**Session Classification:** Heavy Flavour 2