

# **Measurements of open charm production and flow in Au+Au 200 GeV collisions with the STAR experiment at RHIC**

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Heavy flavor quarks are unique tools for studying the properties of the Quark Gluon Plasma (QGP) produced in high-energy nuclear collisions. Since heavy quarks are predominantly created in the initial hard scatterings in a heavy-ion collision, they can access the information of the early time dynamics. In this talk we will present  $p_T$  and centrality dependences of the production and elliptic flow of various charm hadrons (e.g.  $D^0$  and  $D^\pm$ ) at mid-rapidity in Au+Au 200 GeV collisions using the STAR Heavy Flavor Tracker dataset. In addition, we will present their nuclear modification factors and compare them to those for lighter hadrons as well as to theoretical calculations. Physics implications of these measurements will be discussed.