Measurements of open charm production and anisotropic flow in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV 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 give us access to early time dynamics and the properties of the hot and dense matter generated in the collision. In this talk we will present transverse momentum and centrality dependences of the production (D^0 and $D^{\pm}$) and elliptic flow of D^0 mesons at mid-rapidity in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV using the STAR Heavy Flavor Tracker. In addition, we will present their nuclear modification factors and compare them to those for light hadrons as well as to theoretical calculations. Physics implications of these measurements will be discussed.