

# Measurement of $D^0$ Meson Tagged Jets in Au+Au Collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV at STAR

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## 1 Abstract

1 The properties of the Quark-Gluon Plasma (QGP) produced in heavy-ion collisions can be  
2 studied using jets generated in hard scattering processes at the early stages of the collision.  
3 These jets lose energy and have their shower structures modified relative to that in the  
4 vacuum due to jet-medium interaction — known as ‘jet quenching’.

5 The transverse momentum ( $p_{\text{T}}$ ) fraction of the jet carried by hadrons along the jet axis  
6 ( $z = \vec{p}_{\text{T,hadron}} \cdot \hat{p}_{\text{T,jet}} / |\vec{p}_{\text{T,jet}}|$ ) is related to the jet fragmentation function, and connects the  
7 production of quarks and gluons in the perturbative regime with the hadronized final-state  
8 particles in the non-perturbative regime. In the QGP medium, modifications to the frag-  
9 mentation function compared to that in a vacuum can provide insights into the underlying  
10 mechanism of jet quenching. A study of the fragmentation function for charm meson tagged  
11 jets can reveal further details about the flavor dependence of the medium-induced parton  
12 energy loss.

13 In this poster, we report measurements of  $D^0$  meson tagged jets in Au+Au collisions  
14 at  $\sqrt{s_{\text{NN}}} = 200$  GeV, collected by the STAR experiment at RHIC. We show the nuclear  
15 modification factors as a function of  $p_{\text{T,jet}}$  and  $z$  for  $D^0$  jets. Additionally, we report the  
16 radial profile of the  $D^0$  mesons in these tagged jets. Such flavor tagged measurements can  
17 help to discriminate between different models of jet quenching in the medium and study the  
18 properties of the QGP.