

Fragmentation Function of D^0 meson tagged Jets in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV

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1 Abstract

The properties of the Quark Gluon Plasma (QGP) produced in heavy ion collisions can be studied by using the jets generated in hard scattering processes at the early stages of the collision. These jets lose energy and have their shower structure modified compared to those in vacuum by a process called ‘*jet quenching*’.

Jet fragmentation function describes the relative transverse momentum distribution of identified hadrons along the jet axis inside jets. In vacuum, this observable can reveal important information about the processes which produce the hadrons. In the QGP medium, modifications to the fragmentation function can provide a better characterisation of the underlying contributions to quenching. Such modifications have been observed at the CMS and ATLAS experiments at LHC for inclusive jets. The fragmentation function also connects the production of the quarks and gluons in the perturbative regime with the hadronized final state particles that make up the jets. A study of the fragmentation function for charm meson tagged jets can therefore reveal further details about the flavor dependence of medium induced parton energy loss.

We report the first measurements of the jet fragmentation function in D^0 meson tagged anti- k_T jets of radius $R = 0.4$ reconstructed from Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV, collected by the STAR experiment at RHIC. Such flavor differential measurements can help discriminate between different models of energy loss in the medium and determine the precise properties of the QGP.