

Measurements of jet momentum profile and generalized angularities in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV

at STAR

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Abstract

1 Jets are produced in early stages of heavy-ion collisions and undergo modified show-
2 ering in the quark-gluon plasma (QGP) medium relative to a vacuum case. These
3 modifications can be measured using observables like jet momentum profile and gen-
4 eralized angularities to study the details of jet-medium interactions. Jet momentum
5 profile ($\rho(r)$) encodes radially differential information about jet broadening and has
6 shown migration of charged energy towards the jet-periphery in Pb+Pb collisions at
7 the LHC. Measurements of generalized angularities (girth g and momentum dispersion
8 p_T^D) and LeSub (difference between leading and subleading constituents) from Pb+Pb
9 collisions at the LHC show harder, or more quark-like jet fragmentation, in the pres-
10 ence of the medium. Measuring these distributions in heavy-ion collisions at RHIC
11 will help us further characterize the jet-medium interactions in a phase-space region
12 complimentary to that of the LHC.

13 In this talk, we present the first measurements of fully corrected $\rho(r)$, g , p_T^D and
14 LeSub observables using hard-core jets (jets constructed using constituents with $p_T > 2$
15 GeV/c to suppress the combinatorial background) in Au+Au collisions at $\sqrt{s_{NN}} = 200$
16 GeV, collected by the STAR experiment at RHIC. Medium modifications are assessed
17 by calculating nuclear modification factors relative to the $p + p$ baseline. Finally, data
18 are compared with model calculations and the physics implications are discussed.