

1 **Measurement of medium-induced modification of jet yield and**
2 **acoplanarity using semi-inclusive γ_{dir} +jet and π^0 +jet distributions**
3 **in $p+p$ and central Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV by STAR**

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6 We report high-statistics measurements of semi-inclusive distributions of
7 charged jets recoiling from high- E_T direct photon (γ_{dir}) and π^0 triggers in
8 $p+p$ and central Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. In a semi-inclusive
9 approach, event bias is induced solely by the choice of trigger; separately uti-
10 lizing γ_{dir} and π^0 triggers in this analysis therefore provides direct comparison
11 of jet quenching effects for jet populations with different q/g fractions and
12 different in-medium path length distributions. Jets are reconstructed from
13 charged particles using the anti- k_T algorithm with jet resolution parameters
14 $R_{\text{jet}} = 0.2$ and 0.5 . The large uncorrelated background in central Au+Au
15 collisions is corrected using a mixed event technique. This enables a jet
16 measurement extending to low p_T and large R_{jet} with well-controlled sys-
17 tematic uncertainties, which are of particular importance in searching for
18 jet scattering effects. We report recoil jet yield and trigger-jet acoplanarity
19 distributions for jets with $p_T > 5$ GeV/ c . The comparison of recoil yields in
20 Au+Au and $p+p$ collisions at fixed R_{jet} probes energy loss in heavy-ion colli-
21 sions. Moreover, the comparison of recoil yields for different R_{jet} in Au+Au
22 and $p+p$ collisions probes intra-jet broadening. The modification of trigger-
23 jet acoplanarity distributions in central Au+Au collisions relative to $p+p$
24 collisions highlights the sensitivity of such a measurement to QGP transport
25 parameters. We also search for evidence of large-angle scattering of jets off
26 of quasi-particles in the QGP. The measured recoil yields and acoplanarity
27 distributions are compared to theoretical calculations.