



Contribution ID: 564

Type: Oral presentation

## Measurement of medium-induced modification of jet yield and acoplanarity using semi-inclusive $\gamma_{\text{dir}}$ +jet and $\pi^0$ +jet distributions in $p+p$ and central Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV by STAR

*Tuesday, 5 April 2022 17:30 (20 minutes)*

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

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**Session Classification:** Parallel Session T04: Jets, high- $p_T$  hadrons, and medium response

**Track Classification:** Jets, high- $p_T$  hadrons, and medium response