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γ+jet and π^0+jet Measurements in Au+Au Collisions at $\sqrt{s_{\mathrm{NN}}}$ = 200 GeV with the STAR Experiment

Tuesday 2 June 2020 11:20 (20 minutes)

Jets recoiling from a direct photon are seen as a relatively clean probe, due to the more tightly constrained initial hard scattering kinematics compared to di-jet measurements. In this talk, we will present semi-inclusive measurements of jets recoiling from direct-photon and π^0 triggers in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV, both their yield and the transverse momentum imbalance ($x_{J\gamma} = p_{T,Jet}/p_{T,\gamma}$). The dataset used has integrated luminosity 13 nb^{-1} recorded by the STAR experiment in 2014, with isolated photon and π^0 triggers with $9 < E_T^{trig} < 20$ GeV and recoil jets reconstructed with the anti-k$_T$ algorithm. We report fully corrected direct-photon and π^0-triggered charged recoil jet yields for resolution parameter R=0.2 and R=0.5. A Mixed Event technique developed previously by STAR is used to correct the charged recoil jet yield for uncorrelated background, enabling recoil jet measurements over a broad p$_{T,jet}$ range. The comparison between direct-photon and π^0-triggered recoil jets is of particular interest because of the access to the different underlying physics between the two cases, such as differences in parton flavor, initial parton energy, and the level of surface bias. We also discuss the radial dependence of in-medium parton energy loss at the top RHIC energy. The transverse momentum imbalance ($x_{J\gamma}$) will be presented for uncorrected full and charged jets (with R=0.4) as compared to baseline expectations. An outlook to $x_{J\gamma}$ with different constituent selections will also be shown.

Collaboration (if applicable)

STAR

Track

Jets and High Momentum Hadrons

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