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Probing the medium with γ -jet correlation measurements in STAR

One of the most exciting discoveries at RHIC was the observation of the large suppression of high p_T hadrons in Au+Au collisions. However, the single-particle spectra do not constrain the energy loss mechanism in the created medium. To quantify the energy loss, an observable that is directly sensitive to the hard scattering kinematics is needed. Azimuthal angular correlations of direct photons with away-side hadrons from jets (γ -jet measurements) provide such a measure.

We present the STAR results for the γ -jet measurement in 200 GeV $Au + Au$ collisions from the latest RHIC run. A transverse shower shape analysis in the STAR Barrel Electromagnetic Calorimeter is used to discriminate between the direct photons and photons from decays at high p_T . A comparison between the direct γ -jet correlations and π^0 -jet correlations is also shown. We discuss how these measurements constrain the energy loss mechanism and the density of the strongly interaction matter.