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PHENIX Results on In-Medium Jet Modification Using π^0 and Direct Photon-Triggered Two-Particle Correlations

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nbsp;nbsp;nbsp;nbsp;nbsp;Jets in $A + A$ collisions are modified both in terms of their particle yield and that they appear broader when compared to their counterparts in $p+p$ collisions. This modification stems from the energy loss of hard-scattered partons traversing the Quark Gluon Plasma (QGP) before fragmenting into jets. Examining the jet modification allows us to study how the jet energy energy diffuses as the hard-scattered partons traverse the QGP, as well as the possible modification of the fragmentation function, $D(z)$, due to energy loss. PHENIX has made new measurements using two particle correlations to study jet modification. By spatially correlating all charged hadrons in an event to a high p_T trigger, one can observe modifications to the yield and angular distribution of the away-side jets peaking opposite the trigger particle direction. I_{AA}, the ratio of the away-side integrated yield in $A+A$ to that in $p+p$, is extracted from two-particle correlations. For direct photon triggered two-particle correlations in particular, I_{AA} provides insight into fragmentation function modification as the integrated conditional yields Y_{AA} and Y_{pp} are related to the fragmentation functions, $D_{AA}(z)$ and $D_{pp}(z)$, i.e.: $I_{AA} = \frac{Y_{AA}}{Y_{pp}} \approx \frac{D_{AA}(z)}{D_{pp}(z)}$.
nbsp;nbsp;nbsp;nbsp;nbsp;This poster will show the latest two-particle correlation results by PHENIX in $Au + Au$ collisions at $\sqrt{s_{NN}} = 200$˜GeV collisions, utilizing both the π^0 and the direct photon as the trigger species. To quantify modification of the recoil jets opposite the trigger particle, measurements of the away-side I_{AA} and Gaussian jet width σ will be shown as a function of the associate particle p_T. Additionally, a new PHENIX result, the I_{AA} as a function of the separation angle between the trigger and associate particle, $\Delta\phi$, probes modification to the fragmentation function spatially and in p_T.

Collaboration (if applicable)

PHENIX

Track

Jets and High Momentum Hadrons

Contribution type

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