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Photon - Hadron Correlations in Heavy Ion Collisions from PHENIX

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Direct photon-jet pairs are produced in the initial hard scattering of nucleons in A+A collisions in which a quark-gluon plasma is formed. The photon is not affected by the quark-gluon plasma, while the jet loses energy. This allows the direct photon to be an energy calibrator for the jet which can then be studied through photon-hadron pair correlations. Obtaining direct photons is challenging because of the myriad of background photons. Typically, a statistical subtraction method is used in A+A at RHIC. In addition to a statistical method, we have also developed a direct method to obtain isolated photons in A+A by using an isolation cut like those used in direct photon identification in p+p collisions. The isolation cut provides for a cleaner sample of direct photons, potentially reducing the systematic uncertainties on direct photon-hadron correlations when compared to the statistical subtraction sample but presents its own new challenges in the high multiplicity A+A environment. We present the status of centrality-dependent direct photon-hadron angular correlations and fragmentation functions in A+A collisions as well as results from recent high-statistics PHENIX datasets.

Content type

Experiment

Collaboration

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Primary author: Mr DANLEY, Tyler (PHENIX Collaboration)

Presenter: Mr DANLEY, Tyler (PHENIX Collaboration)

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