

# PHENIX measurement of direct photon-triggered two-particle correlations in heavy ion collisions and its implication of the medium induced energy loss.

*Tuesday 2 October 2018 14:00 (20 minutes)*

Direct photon-hadron correlations are an excellent probe for QCD effects, including parton energy loss in the Quark-Gluon Plasma. At leading order, direct photons balance the pT of the away-side jet. In addition, as a colorless probe, direct photons do not interact strongly with the colored medium providing a less biased trigger than a single high-pT hadron. PHENIX has measured direct photon-triggered two-particle azimuthal correlations in a variety of collision systems at 200 GeV. In d+Au collisions, no modification of the per-trigger pair yields compared to p+p collisions was observed constraining the amount of cold nuclear matter effects in such collisions. In A+A collisions, direct photons have been identified statistically as well as using an isolation cut. Combining data sets from different collision systems allows us to quantify the transition from suppression at high  $z_T$  ( $=p_T, h/p_T, \gamma$ ) to the enhancement of low  $z_T$  particles relative to p+p, and to study this transition as a function of trigger pT. Integrating per-trigger yields in different ranges of the away-side gives insights on the redistribution of energy within the jet. The implication for our understanding energy from these measurements will be discussed.

## Summary

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**Session Classification:** Parallel 1