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Measurements of direct-photon-hadron correlations and direct-photon azimuthal anisotropy by STAR

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Many observations have indicated that the fragmentation functions in nucleus-nucleus collisions are softened compared to that in proton-proton collisions. Different theoretical models have been proposed in order to describe the observed phenomena. For a deeper insight into the underlying physics and better constraints for the extracted parameters of the medium formed in nucleus-nucleus collisions, a calibrated probe is needed. Direct photons act as such probes, providing experimental tools to explore energy loss of hard-scattered partons.

We report systematic studies of azimuthal correlations of charged hadrons with respect to a direct-photon trigger in p+p and Au+Au collisions, using new data collected in 2008, 2009, and 2011. The nuclear modification factor of coincidence rate, I_{AA} , will be shown. We also report direct-photon azimuthal anisotropy as a function of transverse momentum at mid-rapidity with event plane reconstructed from particles at forward rapidity in Au+Au collisions using the STAR detector at RHIC. We discuss the results in the scope of current theoretical models.

On behalf of collaboration:

STAR

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