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Photon-Jet correlations in p-p and A-A collisions using the JETSCAPE framework

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It is now well established that jet modification is a multistage effect; hence a single model alone cannot describe all facets of jet modification. The JETSCAPE framework is a multistage framework that uses several modules to simulate different stages of jet propagation through the QGP medium. These simulations require a set of parameters to ensure a smooth transition between stages. We fine tune these parameters to successfully describe a variety of observables, such as the nuclear modification factors of leading hadrons and jets, jet shape, and jet fragmentation function.

Photons can be produced in the hard scattering or as radiation from quarks inside jets. In this work, we study photon-jet transverse momentum imbalance and azimuthal correlation for both p-p and A-A collision systems. All the photons produced in each event, including the photons from hard scattering, radiation from the parton shower, and radiation from hadronization are considered with an isolation cut to directly compare with experimental data. The simulations are conducted using the same set of tuned parameters as used for the jet analysis. No new parameters are introduced or tuned. We demonstrate a significantly improved agreement with photons from A-A collisions compared to prior efforts. This work provides an independent, parameter free verification of the multistage evolution framework.

Collaboration (if applicable)

JETSCAPE

Track

Electroweak Probes

Contribution type

Contributed Talk

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