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Photon-triggered jets as probes of multi-stage jet modification

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Prompt photons are created in the early stages of heavy ion collisions and traverse the QGP medium without any interaction. Therefore, photon-triggered jets can be used to study the jet quenching in the QGP medium. In this work, photon-triggered jets are studied through different jet and jet substructure observables for different collision systems and energies using the JETSCAPE framework. Since the multistage evolution used in the JETSCAPE framework is adequate to describe a wide range of experimental observables simultaneously using the same parameter tune, we use the same parameters tuned for jet and leading hadron studies. The same isolation criteria used in the experimental analysis are used to identify prompt photons for better comparison. For the first time, high-accuracy JETSCAPE results are compared with multi-energy LHC and RHIC measurements to better understand the deviations observed in prior studies. These JETSCAPE results are used to predict upcoming sPHENIX results. This study highlights the importance of multistage evolution for the simultaneous description of experimental observables through different collision systems and energies using a single parameter tune.

Category

Theory

Collaboration (if applicable)

JETSCAPE Collaboration

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