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The evolution of jets and high-pT probes in small collisions systems using a multistage framework

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Understanding the modification of jets and high-p_T probes in small systems requires the integration of soft and hard physics. We present recent developments in extending the JETSCAPE framework to build an event generator, which includes correlations between soft and hard partons, to study jet observables in small systems. The multi-scale physics of the collision is separated into different stages. Hard scatterings are first sampled at binary collision positions provided by the Glauber geometry. They are then propagated backward in space-time following an initial-state shower to obtain the initiating partons' energies and momenta before the collision. These energies and momenta are then subtracted from the incoming colliding nucleons for soft-particle production, modeled by the 3D-Glauber + hydrodynamics + hadronic transport framework. This new hybrid approach includes non-trivial correlations between jet and soft particle productions in small systems. We calibrate this framework with the measured event activity distributions in p+p and p+Pb collisions at 5.02 TeV. We further compare our results for final state hadron's p_T-spectra from low to high p_T in p+p and p+Pb collisions with experimental results in p+Pb at the LHC. Lastly, we present results of additional observables such as the distributions of jet recoiling from a high-p_T hadron and the nuclear modification factor R_{pPb} as a function of event activity.

Category

Theory

Collaboration (if applicable)

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