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p+p PHYSICS WITH THE JETSCAPE 1.0 FRAMEWORK

The JETSCAPE Collaboration (Jet Energy-loss Tomography with a Statistically and Computationally Advanced Program Envelope) has developed and released an innovative, modular and flexible event generator to be used by the heavy-ion community. In this talk we discuss simulations of p+p collisions using this generator, with emphasis on jet production and jet observables. We present calculations of several jet and hadron observables in p+p collisions which have been used to tune the event generator. These provide important baseline results for simulations of nuclear collisions. The design and physical modeling used is strongly constrained by the need for a smooth interpolation from p+p to A+A collisions. The JETSCAPE modules used in these calculations and their interplay will be discussed. These modules include PYTHIA for initial hard scatterings, MATTER (a virtuality ordered shower) for final state parton showers, and different string fragmentation routines for hadronization in combination with a remnant parton from the longitudinally expanding medium. The effect of varying the match-merging conditions between PYTHIA and MATTER will be explored. The role and physical effect of tracking the color of each parton in the multiple showers will be elucidated. We present jet and high-pT hadron cross sections as well as transverse jet shape and fragmentation functions in p+p collisions. We compare to experimental data and results from other calculations and event generators.

Summary

Author: FRIES, Rainer (Texas A&M University)

Presenter: FRIES, Rainer (Texas A&M University)

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