

A PYTHIA 8 Underlying Event Tune For RHIC Energies

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In this talk we will report a new underlying event tune for the PYTHIA 8 Monte Carlo event generator that is applicable for hadron collisions primarily at \sqrt{s} ranges available at the Relativistic Heavy-Ion Collider (RHIC). This study is the first tuning exercise of the multi-parton interactions/underlying event parameters in PYTHIA 8 utilizing RHIC data at $\sqrt{s} = 200$ GeV. We compare our new PYTHIA 8 tuned predictions to mid-rapidity inclusive π^\pm spectra, jet sub-structure, Drell-Yan production, and underlying event observables from RHIC and the Tevatron, as well as underlying event data from the Large Hadron Collider. With respect to the default PYTHIA 8 Monash Tune, the new tune shows significant improvements in the description of the experimental data across all center-of-mass energies used in the tuning. Additionally, we explore the validity of PYTHIA 8 predictions for forward rapidity π^\pm in $\sqrt{s} = 200$ GeV collisions.