Drell-Yan Production Using a New Approach PDF2ISR in the PYTHIA Event Generator

A new approach, PDF2ISR, constructing an initial state parton shower which is fully consistent with the parton densities is applied to Drell-Yan production.

PDF2ISR is implemented inside the Pythia8 event generator and allows a full comparison with measurements.

This new approach is systematically cross checked with predictions using the same parton densities, including Transverse Momentum Dependent (TMD) parton density functions, inside the CASCADE event generator. After completing the systematic analysis using the toy model, the PDF2ISR approach will be applied to the simulation of real Drell-Yan pairs and compared with the most recent experimental measurements of Drell–Yan production cross sections as a function of the pair's transverse momentum.

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