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## **MBR Monte Carlo Simulation in PYTHIA8**

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We present the MBR (Minimum Bias Rockefeller) Monte Carlo simulation of (anti)proton-proton interactions and its implementation in the PYTHIA8 event generator. We discuss the total, elastic, and total-inelastic cross sections, and three contributions from diffraction dissociation processes that contribute to the latter: single diffraction, double diffraction, and central diffraction or double-Pomeron exchange. The event generation follows a renormalized-Regge-theory model, successfully tested using CDF data. Based on the MBR-enhanced PYTHIA8 simulation, we present cross-section predictions for the LHC and beyond, up to collision energies of 50 TeV.

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