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New tunes of PYTHIA8 to the Minimum Bias data at 13TeV using different PDF sets

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PYTHIA8 simulates a number of physics aspects by implementing several models along with theory, these models have many free parameters that need to be tweaked for the best description of data. In this study, we use PYTHIS8.2 for the simulation of Multiparton Interactions using different PDF sets from LAHPDF6. Altogether five parameters were selected for the final tune depending on their sensitivity to the selected observables at 13TeV published by ATLAS Collaboration. Simulated experimental analysis data is obtained using the Rivet analysis toolkit. These tunes are substantial improvements on existing standard choices and describe the selected data reasonably well. Tuning results are also compared with the default tunes in PYTHIA8.2.

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