

PDF4LHC21: Benchmarking, Combination and Phenomenology

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Motivated by recent progress in the PDF determinations carried out by the CT, MSHT, and NNPDF groups, we present an updated combination of global PDF fits: PDF4LHC21. It is based on the Monte Carlo combination of the CT18, MSHT20, and NNPDF3.1 sets followed by either its Hessian reduction or its replica compression. Extensive benchmark studies are carried out in order to disentangle the origin of the differences between the three global PDF sets. In particular, dedicated fits based on almost identical theory settings and input datasets have been performed by the three groups, highlighting the role played by the respective fitting methodologies. We will compare the new PDF4LHC21 combination with its predecessor, PDF4LHC15, and study the phenomenological implications of PDF4LHC21 for a representative selection of inclusive, fiducial, and differential cross sections at the LHC. The PDF4LHC21 combination will be made available via the LHAPDF interface for the upcoming Run III of the LHC and beyond.

Submitted on behalf of a Collaboration?

Yes

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