

Progress and Challenges in Phenomenological Determination of PDFs

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We present new parton distribution functions (PDFs) at next-to-next-to-leading order (NNLO) from the CTQTEA global analysis of quantum chromodynamics. The CT25 PDFs incorporate new data from the LHC and employ a more flexible parametrization, enabling improved fits to the various quark flavor combinations. The CT25 PDFs include a central set and Hessian error sets. Instead of the combined global + dynamic tolerance used in CT18, the main CT25 PDF set uses only a dynamic tolerance. We also present CT25 PDFs at leading order (LO) and next-to-leading order (NLO), along with (N)NLO sets for different α_s values, and PDF4LHC-like sets. Phenomenological implications are discussed, with emphasis on Higgs production at the 13 TeV LHC.

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