

The path to approximate N3LO NNPDF Parton Distributions

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We extend the existing NNPDF4.0 sets of parton distributions (PDFs) to approximate next-to-next-to-next-to-leading (aN3LO).

We construct an approximation to the N3LO splitting functions that includes all available partial information from both fixed-order computations and from small- and large- x resummation, and estimate the uncertainty on this approximation. We include known N3LO corrections to DIS structure functions.

The determined PDFs will account both for uncertainties due to incomplete knowledge of N3LO terms and to missing higher corrections.

We compare our results to the existing aN3LO PDFs from the MSHT group.

Finally, we examine the phenomenological impact of aN3LO PDFs at LHC, giving a first assessment of the impact on the Higgs and Drell-Yan total production cross-section. We find that aN3LO corrections to NNPDF4.0 PDFs are in agreement with their NNLO counterparts, that they improve the description of the global dataset and the perturbative convergence.

Alternate track

1. Higgs Physics

I read the instructions above

Yes

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