

Precision determination of nucleon PDFs

The NNLO precision PDF becomes a standard. What is next?

- N3LO predictions available for DIS, Higgs, DY production, which requires **N3LO PDFs**
- PDFs with **NLO EW** corrections for precision measurements. For high energy colliders, such as 100 TeV pp collider, we even need **EW PDFs**, including lepton, EW gauge boson, and Higgs components.
- **Resummation** effects: small- x and threshold resummation
- Understanding better about various uncertainties: theoretical uncertainties (MC, R/F scales), heavy flavors, high twists, target mass, nuclear effect, etc
- **Fast computations**: parallelization, interpolation techniques (fastNLO + APPLgrid \rightarrow APPLfast), fast sensitivity study (xFitter, ePump, PDFsense etc.)
- Connection with pseudo PDFs from lattice simulation: charge asymmetry, intrinsic PDFs
- Precision measurements in the future experiments: LHC Run-2,3, HE-, HL-LHC, LHeC, EIC