

QED PDFs in HERAFitter

work in progress

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Status

Implemented:

- A parametrization of photon PDF in HERAPDF style:

$$x\gamma(x) = A_\gamma x^{B_\gamma} (1-x)^{C_\gamma} (1 + D_\gamma x + E_\gamma x^2)$$

I used minuit parameter indices 91, 92, 93, 94 and 98 for parameters A_γ , B_γ , C_γ , D_γ and E_γ , respectively.

- Modification of momentum sum rule

$$\int_0^1 dx \times [\gamma(x, Q^2) + g(x, Q^2) + \Sigma(x, Q^2)] = 1.$$

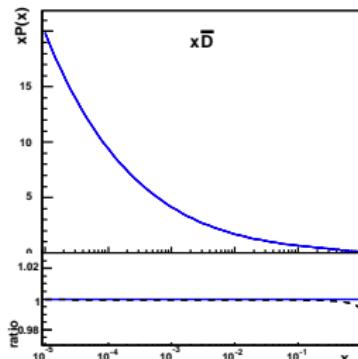
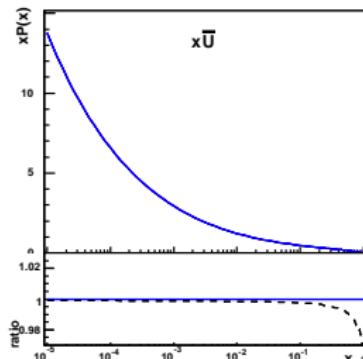
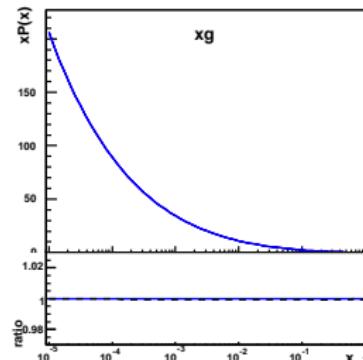
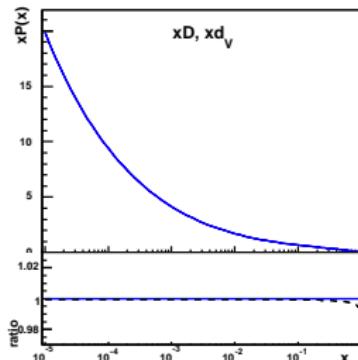
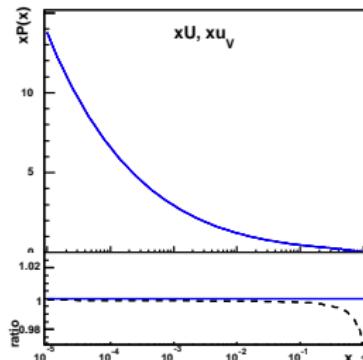
to accomodate photon PDF

- QED-modified evolution with the latest beta version of QCDCNUM program (v. 17-00-01c)

Start working on implementation of:

- APPLGRID interface to SANC Monte Carlo generator for evaluation of $\gamma\gamma \rightarrow \ell^+\ell^-$ cross-section at LO

PDFs with and without QED corrections



output/nlo qcd

output/nlo qcd + lo qed

$$Q^2 = 8317.00 \text{ GeV}^2$$

Plans

- Complete the implementation of APPLGRID interface to SANC Monte Carlo generator for evaluation of $\gamma\gamma \rightarrow \ell^+\ell^-$ cross-section at LO
- Add the possibility of QCD NNLO + QED NLO PDF fits