Contribution ID: **93** Type: **Parallel talk**

QED parton distribution functions in the MSHT20 fit

Wednesday 4 May 2022 10:40 (20 minutes)

We present the MSHT20qed set of parton distribution functions (PDFs). These are obtained from the MSHT20 global analysis via a refit including QED corrections to the DGLAP evolution at $calO(\alpha), calO(\alpha\alpha_S)$ and $calO(\alpha^2)$, and containing the photon PDF of the proton. As in the previous MMHT15qed study we use an input distribution for the photon that is derived from the LUXqed formulation, and find good consistency for the photon PDF with that of MMHT15qed, as well as with other recent sets. We also present a set of QED corrected neutron PDFs and accompanying photon distribution, and provide the photon PDF of the nucleons separated into elastic and inelastic contributions. We assess the general expectations for the impact of photon–initiated (PI) corrections to processes entering PDF fits, and review the effect of QED corrections on the other partons and on the fit quality, where electroweak corrections (including PI production) are appropriately added to the cross sections wherever possible. We explore the phenomenological implications of this set by comparing to a variety of benchmark cross sections, finding small but significant corrections due to the inclusion of QED effects in the PDFs.

Submitted on behalf of a Collaboration?

No

Authors: MARTIN, Alan; Dr HARLAND-LANG, Lucian (University of Oxford); THORNE, Robert Samuel (University College London (UK)); CRIDGE, Thomas (University College London)

Presenter: Dr HARLAND-LANG, Lucian (University of Oxford)

Session Classification: WG3: Electroweak Physics and Beyond the Standard Model

Track Classification: WG3: Electroweak Physics and Beyond the Standard Model