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HERAFitter - an open source QCD fit framework

The proton parton distribution functions (PDFs) are essential for precision physics at the LHC and other hadron colliders. Their current level of accuracy dominates the theory uncertainties in Higgs production and it affects substantially theory predictions for Beyond Standard Model high mass production.

The determination of the PDFs is a complex endeavor involving several physics process.

The main process is the lepton proton deep-inelastic scattering (DIS), with data collected by the HERA ep collider covering a large kinematic phase space needed to extract PDFs.

Further processes (fixed target DIS, ppbar collisions etc.) provide additional constraining powers for flavour separation. In particular, the precise measurements obtained or to come from LHC will continue to improve the knowledge of the PDF.

HERAFitter project is an open source QCD fit framework ready to extract PDFs and assess the impact of new data which we would like to present here. The framework includes modules allowing for a various theoretical and methodological options, capable to fit a large number of relevant data sets from HERA, Tevatron and LHC. This framework is already used in many analyses at the LHC.

A new release is available publicly with added features for different parametrisation methods, alternative options to assess the impact of new data based on bayesian reweighting technique, different representation of the chisquare, as well as the option to accomodate for asymmetric systematic uncertainties.

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