

## PDF Fits at HERA

*vendredi 22 juillet 2011 16:30 (30 minutes)*

This talk will present a summary of QCD fits of H1 and ZEUS data to determine improved PDFs. The QCD fit analysis of the combined HERA-I inclusive deep inelastic cross sections has been extended to include combined HERA II measurements at high  $Q^2$ . The precision of the PDFs at high- $x$  is considerably improved - particularly in the valence sector. A preliminary NNLO QCD analysis is presented using the NC and CC inclusive DIS cross sections obtained from the combination of the measurements from H1 and ZEUS based on the published HERA I and the preliminary HERA II data. The HERAPDF1.5NNLO fit is performed in the NNLO DGLAP scheme as implemented in the evolution code QCDNUM 17. In comparison to the most recent HERAPDF1.5 NLO, a more flexible parameterisation for the present QCD fits has been chosen which affects most gluon distribution at low  $x$ . A full set of the PDF uncertainties for HERAPDF1.5NNLO is determined.

A NLO QCD PDF fit analysis with simultaneous determination of the strong coupling constant  $\alpha_s(M_Z)$  is also presented. The analysis is based on the same combined H1 and ZEUS inclusive DIS measurements as HERAPDF1.5 fit, together with jet measurements provided by both H1 and ZEUS collaborations. A QCD fit analysis to the combined HERA-I inclusive deep inelastic cross sections measured by the H1 and ZEUS collaborations for ep scattering, including the HERA-II measurements with reduced proton-beam energies,  $E_p = 460\text{GeV}$  and  $E_p = 575\text{GeV}$ , is also presented. The effect of including the new data on the determination of HERA parton distribution functions is analysed, using fits similar to those performed for HERAPDF1.0. The combined H1 and ZEUS data on inclusive ep cross-sections together with the combined data on the semi-inclusive structure function  $F_2(\text{charm})$  are used to extract the parton densities of the proton at NLO.

Finally, a preliminary global NLO QCD analysis of the HERA data is presented. The following data sets are used in this analysis: the NC and CC inclusive DIS cross sections obtained from the combination of the measurements from H1 and ZEUS based on HERA I and HERA II data at the nominal proton beam energy, the preliminary combined inclusive NC DIS cross sections at reduced proton beam energies, the inclusive jet cross sections from H1 and ZEUS and

the preliminary combined HERA results on the structure function  $F_2(\text{charm})$ . A NLO QCD fit is performed on these data sets to determine simultaneously the proton PDF, the strong coupling constant  $\alpha_s$  and the heavy flavour scheme dependent parameter of the charm quark mass.

**Auteur principal:** Dr BEHNKE, Olaf (DESY)

**Orateur:** COOPER-SARKAR, Amanda

**Classification de Session:** QCD