

# Dedicated data analyses for improving PDFs: Study of proton parton distribution functions at high $x$ and charm production in charged DIS at HERA

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Proton parton distribution functions (PDFs) are poorly constrained by existing data for Bjorken  $x$  larger than 0.6, and the PDFs extracted from global fits differ considerably from each other. A technique for comparing predictions based on different PDF sets to observed event numbers is presented. It is applied to compare predictions from the most commonly used PDFs to published ZEUS data at high Bjorken  $x$ . A wide variation is found in the ability of the PDFs to predict the observed results. A scheme for including the ZEUS high- $x$  data in future PDF extractions is discussed.

Charm production in charged current deep inelastic scattering has been measured for the first time in  $e^+e^-$  collisions, using data collected with the ZEUS detector at HERA, corresponding to an integrated luminosity of  $358 \text{ pb}^{-1}$  separately for  $e^+p$  and  $e^-p$  scattering at a centre-of-mass energy of  $\sqrt{s}=318 \text{ GeV}$  within a kinematic phase-space region of  $200 \text{ GeV}^2 < Q^2 < 60000 \text{ GeV}^2$  and  $x < 0.9$ , where  $Q^2$  is the squared four-momentum transfer and  $x$  is the inelasticity. The measured cross sections of electroweak charm production are consistent with expectations from the Standard Model within the large statistical uncertainties.

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**Secondary track (number)**

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