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Inclusive D^0 and $D^{*\pm}$ Production in Deep-Inelastic ep Scattering at HERA

H1 Collaboration

Abstract

First results on inclusive D^0 and $D^{*\pm}$ production in deep-inelastic ep scattering are reported for 4-momentum transfers squared Q^2 between 10 GeV^2 and 100 GeV^2 using the data collected by the HERA experiment H1 in 1994. Differential cross sections of the D^0 production dynamics are presented for both inclusive analyses. They are found to agree well with the QCD predictions based on the Boson-Gluon-Fusion process including massive quark effects. A stringent upper limit is set on a non-perturbatively generated charm sea in the proton. Results on the inclusive cross sections $\sigma\,(ep \to D^0X)$ and $\sigma\,(ep \to D^{*\pm}X)$ are presented. The ratio of these inclusive cross sections is consistent with the results from e^+e^- experiments and with hadro-production data. From these measurements a charm production cross section in deep-inelastic ep scattering for 10 GeV$^2 < Q^2 <$ 100 GeV^2 and $0.01 < y < 0.8$ is derived. The first measurement of the charm contribution $F_2^{c\bar{c}}\,(x, Q^2)$ to the proton structure function for Bjorken x between $6 \cdot 10^{-4}$ and $7.5 \cdot 10^{-3}$ is made.

Plenary Sessions:
2. Soft Interactions and Diffraction Phenomena - S. Levonian
4. QCD and Low x Physics - H. Abramowicz, R. Brock
7. Heavy Flavours - J. Richman, G. Martinelli
Parallel Session: I Strong Interaction Physics
2. Soft Interactions
3. Structure Functions and Low x Physics
4. Hard Processes and Perturbative QCD
5. Production and Decays of Heavy Flavours