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D^{\pm} , D^0 and Λ_c^+ Production in Deep Inelastic Scattering at HERA

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Measurement of D^{+-} and D^0 Production in Deep Inelastic Scattering Using a Lifetime Tag at HERA

The production of D^{+-} and D^0 mesons has been measured with the ZEUS detector at HERA using an integrated luminosity of 133.6 pb⁻¹. The measurements cover the kinematic range $5 < Q^2 < 1000$ GeV², $0.02 < y < 0.7$, $1.5 < p_T(D) < 15$ GeV and $|\eta(D)| < 1.6$. Combinatorial background to the D meson signals is reduced by using the ZEUS microvertex detector to reconstruct displaced secondary vertices. Production cross sections are compared with the predictions of next-to-leading-order QCD which is found to describe the data well. Measurements are extrapolated to the full kinematic phase space in order to obtain the open-charm contribution, $F_2(c\bar{c})$, to the proton structure function, F_2 .

Measurement of D^+ and Λ_c^+ production in deep inelastic scattering at HERA

Charm production in deep inelastic scattering has been measured with the ZEUS detector at HERA using an integrated luminosity of 120 pb⁻¹. The hadronic decay channels $D^+ \rightarrow K^0_S \pi^+$, $\Lambda_c^+ \rightarrow p K^0_S$ and $\Lambda_c^+ \rightarrow \Lambda \pi^+$, and their charge conjugates, were reconstructed. The presence of a neutral strange hadron in the final state reduces the combinatorial background and extends the measured sensitivity into the low transverse momentum region. The kinematic range is $0 < p_T(D^+, \Lambda_c^+) < 10$ GeV, $|\eta(D^+, \Lambda_c^+)| < 1.6$, $1.5 < Q^2 < 1000$ GeV² and $0.02 < y < 0.7$. Inclusive and differential cross sections for the production of D+ mesons are compared to next-to-leading-order QCD predictions. The fraction of c quarks hadronising into Λ_c^+ baryons is extracted.

Measurement of D^{+-} production production and F_2c extraction in deep inelastic scattering at ZEUS

The production of charm quarks in deep inelastic ep scattering has been measured with the ZEUS detector at HERA using an integrated luminosity of 323 pb⁻¹. Charm events were identified through the $D^+ \rightarrow K^- \pi^+ \pi^+$ (+cc) decay channel. A lifetime tag based on decay length significance was applied to improve the signal to background ratio. The kinematic region was $1.5 < p_T(D^+) < 15$ GeV, $|\eta(D^+)| < 1.6$, $5 < Q^2 < 1000$ GeV² and $0.02 < y < 0.7$. Total and differential cross sections for D^+ production were measured and compared to next-to-leading-order QCD calculations and published ZEUS results. The charm contribution to the proton structure function, F_2c , was extracted. The results agree with previous measurements and are well described by QCD predictions.

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