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D^* Meson Photoproduction in Electron Proton Collisions at HERA

H1 Collaboration

Abstract

Measurements of charm production cross sections in electron-proton collisions at low Q^2 are presented for various kinematic regimes. The heavy quark production is tagged by reconstruction of D^* mesons, which are detected in the decay chain $D^{*+} \rightarrow D^0\pi^+$ with $D^0 \rightarrow K^-\pi^+$. The dependences on the D^* transverse momentum and rapidity of the differential production cross section are presented and compared with next-to-leading order QCD calculations. The results agree well in shape with the predictions, with the exception of a possible enhancement in the rapidity distribution in the direction of the incident proton. The magnitude of the cross section is found to be slightly above that predicted. When taken together with fixed target measurements, the energy dependence of the cross section is found to favour a rather steeply increasing gluon density in the proton at low x. First evidence for the diffractive photoproduction of D^{*+} mesons is presented.

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