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Charm Fragmentation and Excited Charm Meson Production at HERA

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Study of Charm Fragmentation into D^{+-} Mesons in Deep-Inelastic Scattering at HERA
The process of charm quark fragmentation is studied using D^{+-} meson production in deep-inelastic scattering as measured by the H1 detector at HERA. Two different regions of phase space are investigated defined by the presence or absence of a jet containing the D^{+-} *meson in the event. The parameters of fragmentation functions are extracted for QCD models based on leading order matrix elements and DGLAP or CCFM evolution of partons together with string fragmentation and particle decays. Additionally, they are determined for a next-to-leading order QCD calculation in the fixed flavour number scheme using the independent fragmentation of charm quarks to D^{+-}* mesons.

Measurement of the charm fragmentation function in D*photoproduction at HERA*
The charm fragmentation function has been measured in D photoproduction with the ZEUS detector at HERA using an integrated luminosity of 120 pb-1. The fragmentation function is measured versus z, the ratio of E+p_parallel for the D*meson and that for the associated jet, where E is the energy and p_parallel the longitudinal momentum relative to the jet axis. Jets were reconstructed using the k_T clustering algorithm and required to have transverse energy greater than 9 GeV. The D* meson associated with the jet was required to have a transverse momentum greater than 2 GeV. The measured function is compared to different fragmentation models incorporated in leading-logarithm Monte Carlo simulations and a next-to-leading-order calculation. The results are similar to those from e+e- experiments.

Excited charm meson production at HERA
The production of the excited charm mesons D1(2420)0 and D2*(2460)0 in inelastic ep scattering was studied with the ZEUS detector at HERA using an integrated luminosity of 372 pb-1. Masses and widths were determined and and a helicity analysis was performed. The results are compared with previous measurements and with theoretical expectations.

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