



Heavy quark photoproduction at HERA

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Photoproduction of beauty and charm quarks in events with at least two jets has been measured with the ZEUS detector at HERA using an integrated luminosity of 133 pb⁻¹. The fractions of jets containing b and c quarks were extracted using the invariant mass of charged tracks associated with secondary vertices and the decay-length significance of these vertices. Differential cross sections as a function of jet transverse momentum, p_T^{jet}, and pseudorapidity, η_{jet}, were measured. The data are compared with previous measurements and are well described by next-to leading-order QCD predictions.

The cross section of b \bar{b} photoproduction in ep collisions is measured with the H1 detector at HERA. Events containing b-quarks are identified through detection of two low momentum electrons in the final state. Semileptonic decays b \bar{b} → ee X are exploited in the kinematic range of the photon virtuality Q² < 1 GeV², the inelasticity 0.2 < y < 0.8 and the pseudorapidity of the b-quarks |η(b), η(\bar{b})| < 2. The differential b-quark production cross section is measured as a function of the transverse b-quark momentum and extends the previously experimentally accessible phase space towards the b-quark production threshold. The results are compared to other b-quark cross section measurements, as well as to QCD predictions.

Measurements of cross sections for beauty and charm events with dijets and a muon in photoproduction at HERA are presented. Events with dijets of transverse momentum P_T^{jet1} > 7 GeV and P_T^{jet2} > 6 GeV in the pseudorapidity range -1.5 < η_{jet} < 2.5 in the laboratory frame are selected in the kinematic region of Q² < 2.5 GeV² and inelasticity 0.2 < y < 0.8. One of the two selected jets must be associated to a muon with P_T^μ > 2.5 GeV in the pseudorapidity range -1.3 < η_μ < 1.5. The data were collected with the H1 detector in the years 2006 and 2007 corresponding to an integrated luminosity of 179 pb⁻¹. The fraction of beauty and charm events is determined using variables reconstructed with the H1 vertex detector, which measures the impact parameters of the muon tracks with respect to the primary vertex. In addition, the variable P_T^{rel}, the relative transverse momentum of the muon with respect to the axis of the associated jet, is used to determine the beauty and charm content of the events. The measurements are compared with QCD predictions at leading and next-to-leading order and are found to be reasonably well described.

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