

Exclusive Photoproduction at HERA

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The exclusive photoproduction reaction $\gamma p \rightarrow \text{Upsilon} p$ has been studied with the ZEUS experiment in ep collisions at HERA using an integrated luminosity of 468 pb^{-1} . The measurement covers the kinematic range $60 < W < 220 \text{ GeV}$ and $Q^2 < 1 \text{ GeV}^2$, where W is the photon-proton centre-of-mass energy and Q^2 is the photon virtuality. These results, which represent the analysis of the full ZEUS data sample for this channel, are compared to predictions based on perturbative QCD.

The proton-dissociative diffractive photoproduction of J/ψ mesons has been studied in ep collisions with the ZEUS detector at HERA using an integrated luminosity of 112 pb^{-1} . The cross section is presented as a function of the photon-proton centre-of-mass energy and of the squared four-momentum transfer at the proton vertex. The results are compared to perturbative QCD calculations.

The first measurement of diffractive scattering of quasi-real photons with large momentum transfer $\gamma p \rightarrow \gamma Y$, where Y is the proton dissociative system, is made using the H1 detector at HERA. The measurement is performed for initial photon virtualities $Q^2 < 0.01 \text{ GeV}^2$. Cross sections are measured as a function of W , the incident photon-proton centre of mass energy, and t , the square of the four-momentum transferred at the proton vertex, in the range $175 < W < 247 \text{ GeV}$ and $4 < |t| < 36 \text{ GeV}^2$. The W dependence is well described by a model based on perturbative QCD using a leading logarithmic approximation of the BFKL evolution. The measured $|t|$ dependence is harder than that predicted by the model and those observed in exclusive vector meson production.

Based on data collected with the H1 detector at HERA in 2005, cross sections for elastic ρ photoproduction have been measured at momentum transfer $|t| < 0.58 \text{ GeV}^2$ and photon-proton centre-of-mass energies $20 < W < 90 \text{ GeV}$. This data has been combined with cross sections published previously by the Omega and ZEUS collaborations in a global fit to determine the pomeron trajectory $\alpha(t)$ in 13 bins of t from the W -dependence of the elastic ρ production cross section.

Primary authors: SZUBA, Dorota (DESY); ZEUS COLLABORATION, Monica Turcato (Hamburg University)

Presenter: SZUBA, Dorota (DESY)

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