

Diffractive deep-inelastic scattering and jet production in ep collisions at HERA II with H1

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The cross section for the diffractive deep-inelastic scattering process $ep \rightarrow e X p$ is measured, with the leading final state proton detected in the H1 Forward Proton Spectrometer. The data are compared to perturbative QCD predictions at next-to-leading order based on diffractive parton distribution functions previously extracted from complementary measurements of inclusive diffractive deep-inelastic scattering. The ratio of the diffractive to the inclusive ep cross section is studied as a function of Q^2 , β and x_{pom} . Measurements of single and double-differential dijet cross sections in diffractive photoproduction are also presented. Ratios of the diffractive to the inclusive dijet cross sections are measured for the first time and are compared with Monte Carlo models. The production of dijets in diffractive deep inelastic scattering, $ep \rightarrow e \gamma^* p \rightarrow e p \text{ jet1 jet2 X}$, has been measured with the H1 detector at HERA using Very Forward Proton Spectrometer to measure the scattered proton momentum. The cross sections are compared to the predictions from leading-logarithm parton-shower RapGap Monte Carlo and next-to-leading-order QCD calculations based on recent diffractive parton densities extracted from inclusive diffractive deep inelastic scattering data. Finally, the cross section for inclusive jet production in diffractive deep-inelastic scattering is presented. The presented cross sections are corrected to the level of stable hadrons and compared to the Monte Carlo generator level predictions and NLO predictions with applied hadronisation corrections.

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