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Diffractive Dijet Production at HERA

H1 Collaboration, DESY

An analysis of interactions of the type $ep \to eXY$ is presented, where the component X of the hadronic final state is well separated in rapidity from a leading baryonic system with mass $M_Y < 1.6$ GeV. The magnitude of the squared four-momentum transferred at the proton vertex satisfies $|t| < 1$ GeV^2. Cross sections are presented for the production of two jets as components of the system X, each with transverse momentum $p_T^{\mathrm{jet}} >$ 5 GeV relative to the photon direction in the rest frame of X. Results are presented for photoproduction and for electroproduction with photon virtualities in the range $7.5 < Q^2 < 80$ GeV^2. At the present level of precision, models based on a factorisable diffractive exchange with a hard gluon dominated structure, evolved to a scale set by the transverse momentum $\hat{p_T}$ of the outgoing partons in the hard interaction, give good descriptions of the data. Exclusive $q\bar{q}$ production, as calculated in perturbative QCD using the squared proton gluon density, represents at most a small fraction of the data. The possibility of a breaking of diffractive factorisation due to spectator interactions is investigated in resolved photoproduction.