Measurement of Dijet Cross-Sections at Low Q^2 in ep Collisions and the Extraction of an Effective Parton Density for the Virtual Photon

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The triple-differential dijet cross-section, $\mathrm{d}^3\sigma_{ep}/\mathrm{d}Q^2\mathrm{d}\overline{E_t}^2\mathrm{d}x_\gamma^{jets}$, is measured with the H1 detector at HERA as a function of the photon virtuality Q^2, the fraction of the photon's momentum carried by the parton entering the hard scattering, x_γ^{jets}, and the square of the mean transverse energy, $\overline{E_t}^2$, of the two highest E_t jets. Jets are found using a longitudinal boost-invariant k_T clustering algorithm in the $\gamma^* p$ center of mass frame. The measurements cover the ranges $1.6 < Q^2 < 80$ GeV^2 in virtuality and $0.1 < y < 0.7$ in inelasticity y. The results are well described by leading order QCD models which include the effects of a resolved component to the virtual photon. Models which treat the photon as point-like fail to describe the data. An effective leading order parton density for the virtual photon is extracted as a function of the photon virtuality, the probing scale and the parton momentum fraction. The x_γ and probing scale dependences of the parton density show characteristic features of photon structure, and a suppression of this structure with increasing Q^2 is seen.

References

1. H1 Collaboration, C. Adloff *et al*, DESY-98-205 / submitted to Eur. Phys. J. C