

# Jet Production at HERA and determination of $\alpha_s$ with H1

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Inclusive-jet, dijet and trijet differential cross sections have been measured in neutral current deep-inelastic ep scattering for exchanged boson virtualities  $150 < Q^2 < 15000 \text{ GeV}^2$  with the H1 detector at HERA. The measurements are used to determine value of the strong coupling  $\alpha_s(M_Z)$ . Additionally, the production of jets is studied at low four momentum transfer squared  $5 < Q^2 < 100 \text{ GeV}^2$  using integrated luminosity of  $300 \text{ pb}^{-1}$ . Cross sections are measured as a function of  $Q^2$  and jet transverse momentum and compared to the perturbative next-to-leading order QCD calculations corrected for hadronisation effects. Finally, the production of jets is studied in deep-inelastic e+p scattering at low negative four momentum transfer squared  $5 < Q^2 < 100 \text{ GeV}^2$  and at inelasticity  $0.2 < y < 0.7$  using data recorded by the H1 detector at HERA in the years 1999 and 2000, corresponding to an integrated luminosity of  $43.5 \text{ pb}^{-1}$ . Inclusive jet, 2-jet and 3-jet cross sections as well as the ratio of 3-jet to 2-jet cross sections are measured as a function of  $Q^2$  and jet transverse momentum. The 2-jet cross section is also measured as a function of the proton momentum fraction  $x$ . The measurements are well described by perturbative quantum chromodynamics at next-to-leading order corrected for hadronisation effects and are subsequently used to extract the strong coupling  $\alpha_s$ .

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