

Jet Production at HERA and determination of α_s with H1

jeudi 21 juillet 2011 09:15 (15 minutes)

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 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 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 α_s .

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Classification de Session: QCD