

Measurement of jet production in deep inelastic scattering and NNLO determination of the strong coupling at ZEUS

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A new measurement of inclusive-jet cross sections in the Breit frame in neutral current deep inelastic scattering using the ZEUS detector at the HERA collider is presented. The data were taken at a centre-of-mass energy of 318 GeV and correspond to an integrated luminosity of 347 pb⁻¹. Massless jets, reconstructed using the kt-algorithm in the Breit reference frame, have been measured as a function of the squared momentum transfer, and the transverse momentum of the jets in the Breit frame. The measurement has been used in a next-to-next-to-leading-order QCD analysis to perform a simultaneous determination of parton distribution functions of the proton and the strong coupling, resulting in a value of $\alpha_s(M_Z^2) = 0.1142 \pm 0.0017$ (exp/fit) $^{+0.0006}_{-0.0007}$ (model/param) $^{+0.0006}_{-0.0004(\text{scale})}$, whose accuracy is improved compared to similar measurements. In addition, the running of the strong coupling is demonstrated using data obtained at different scales.

Alternate track

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