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Measurement and QCD analysis of inclusive jet production in deep inelastic scattering at HERA

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On behalf of the ZEUS Collaboration.

A new measurement of inclusive jet cross sections in neutral current deep inelastic scattering using the ZEUS detector at the HERA collider is obtained. The data were taken at HERA2 at a center of mass energy of 318 GeV and correspond to an integrated luminosity of 347 pb⁻¹. Massless jets, reconstructed using the k_T-algorithm in the Breit reference frame, are measured as a function of the squared momentum transfer Q² and the transverse momentum of the jets in the Breit frame p_{T,Breit}. The measured jet cross sections are compared to previous measurements as well as NNLO QCD theory predictions. The measurement is used in a QCD analysis at NNLO accuracy to perform a simultaneous determination of parton distribution functions of the proton and the strong coupling constant, resulting in a value of $\alpha_s(MZ^2) = 0.1138 \pm 0.0014$ (exp/fit) $+0.0004 - 0.0008$ (model/param.) $+0.0008 - 0.0007$ (scale). A significantly improved accuracy is observed compared to similar measurements of the strong coupling constant.

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