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

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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 HERA 2 at a center 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, 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(M2Z) = 0.1138 +- 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.

Primary author: WICHMANN, Katarzyna (DESY)

Presenter: LORKOWSKI, Florian (CMS (CMS Fachgruppe QCD))

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