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Inclusive Cross Sections, Parton Density Functions and the strong coupling at HERA

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A combination is presented of all inclusive deep inelastic cross sections previously published by the H1 and ZEUS collaborations at HERA for neutral and charged current ep scattering for zero beam polarisation. The data were taken at proton beam energies of 920, 820, 575 and 460 GeV and an electron beam energy of 27.5 GeV. The data correspond to an integrated luminosity of about 1 fb^{-1} and span six orders of magnitude in negative four-momentum-transfer squared, Q^2 , and Bjorken x . The combined cross sections were input to QCD analyses at leading order, next-to-leading order and at next-to-next-to-leading order, providing a set of parton distribution functions, HERAPDF2.0. By including jet cross sections, a precise determination of the strong coupling α_S is performed.

References: Eur.Phys.J.C75 (2015) 12, 580 [arxiv:1506.06042] and DESY-14-089 Eur.Phys.J.C75 (2015) 2, 65 [arxiv:1406.4709]

Summary

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