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Impact of jet production data on the next-to-next-to-leading order determination of HERAPDF2.0 parton distributions

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The HERAPDF2.0 ensemble of parton distribution functions (PDFs) was introduced in 2015. Presented is the final stage, a next-to-next-to-leading order (NNLO) analysis of the HERA data on inclusive deep inelastic ep scattering together with jet data as published by H1 and ZEUS. A pQCD fit to the data with free $\alpha_s(M_Z^2)$ and free PDFs was used to determine $\alpha_s(M_Z^2)$ with the result $\alpha_s(M_Z^2) = 0.1156 \pm 0.0011$ (exp) $^{+0.0001}_{-0.0002}$ (model + parameterisation) ± 0.0029 (scale). The PDF sets of HERAPDF2.0Jets NNLO were determined with fits using fixed values of $\alpha_s(M_Z^2) = 0.1155$ and $\alpha_s(M_Z^2) = 0.118$. The latter value was already chosen for the published HERAPDF2.0 NNLO analysis based on inclusive data only. The different sets of PDFs are presented and compared. The similarity of the PDFs demonstrates the consistency of inclusive and jet-production cross-section data. Predictions based on HERAPDF2.0Jets NNLO agree very well with the jet-production data used in the fits.

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