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Evidence of higher twist effects in HERA DIS data

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The combined inclusive DIS data from HERA are described with DGLAP fits at NLO and NNLO, combined with a model for twist 4 corrections originating from the GBW saturation model. Besides the higher twist effects, modifications are introduced at small x to the input functions for the twist 2 parton distribution functions that are inspired by findings of QCD at high parton densities. It is shown that both inclusion of the higher twist effects and the input modification of the DGLAP fit lead to significant improvement of the fit quality below $Q^2 = 5 \text{ GeV}^2$. With the best fit employing the NNLO DGLAP evolution combined with higher twist corrections, a good description of DIS data is obtained down to $Q^2 = 1 \text{ GeV}^2$. The impact of higher twist corrections on the parton density functions is presented.

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