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Four-loop large-nf contributions to the non-singlet structure functions

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We have calculated the n_f^2 and n_f^3 contributions to the flavour non-singlet structure functions F_2 and F_L in inclusive deep-inelastic scattering at the fourth order in the strong coupling α_s. The coefficient functions have been obtained by computing a very large number of Mellin-N moments using the method of differential equations, and then determining the analytic forms in N and Bjorken-x from these. Our new n_f^2 terms are numerically much larger than the n_f^3 leading large-nf parts which were already known; they agree with predictions of the threshold and high-energy resummations. Furthermore our calculation confirms the earlier determination of the four-loop n_f^2 part of the corresponding anomalous dimension. The next step is to obtain the expression for the F_3 structure function and therefore complete the unpolarized contributions for n_f^2 and n_f^3 at four-loop.

Submitted on behalf of a Collaboration?

No

Participate in poster competition?

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