

## Pade approximation and non-singlet structure function up to N<sup>3</sup>LO

We present the results of our QCD analysis for nonsinglet unpolarized quark distributions and structure function  $F_2(x, Q^2)$  up to N<sup>3</sup>LO using the Pade approximation. New parameterizations are derived for the nonsinglet quark distributions for the kinematic wide range of  $x$  and  $Q^2$ . The analysis is based on the Jacobi polynomials expansion of the structure function. The higher twist contributions of proton and deuteron structure function are obtained in the large  $x$  region. Our calculations for nonsinglet unpolarized quark distribution functions based on the Jacobi polynomials method are in good agreement with the other theoretical models. The values of  $\Lambda_{\text{QCD}}$  and  $\alpha_s(M_z^2)$  are determined.

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