

# Determination of the Strong Coupling Constant from NNLO QCD Analysis of Proton Structure Function

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The strong coupling constant,  $\alpha_s$ , is the fundamental parameter of Quantum Chromodynamics and its determination both theoretically and experimentally appears to be one of the most important concern for the high energy particle physicist. Therefore it is a hot topic to be looked for in high energy colliders such as LHC. Besides  $\alpha_s$ , parton distribution functions must be used together with the appropriate value of  $\alpha_s$ , since both the input PDFs and  $\alpha_s(M_Z^2)$  are determined from global fits to deep-inelastic and related hard-scattering data. In this article we present a determination of the strong coupling constant and parton distribution functions based on a next-to-next-to-leading order (NNLO) perturbative QCD analysis of proton structure function. More precisely, we extract  $\alpha_s(M_Z^2)$  and PDFs by fitting perturbative QCD predictions to the data from the measurements of the proton structure function  $F_2^p$  in deep inelastic scattering, which are based on perturbative QCD calculations up to NNLO.

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