Contribution ID: **141**   Type: **Parallel**

$\alpha_s(m_Z)$ at approximate N^{3}LO with QED corrections and theory uncertainties

Monday 7 July 2025 14:00 (17 minutes)

We present an updated determination of $\alpha_s(m_Z)$ based on the global NNPDF4.0 analysis at approximate N^{3}LO QCD mixed with NLO QED accuracy. Consistent results are obtained by means of two independent methodologies, both extensively validated using closure tests. We assess the perturbative convergence of our results, the role of QED corrections and the inclusion of a photon PDF, the impact of MHOUs, the dependence on the input dataset, and the impact of m_t uncertainties in the top production cross-sections. Our result provides one of the most precise determinations of the strong coupling obtained in the context of PDF fits.

Secondary track

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Session Classification: T05

Track Classification: T05 - QCD and Hadronic Physics