Contribution ID: **135** Type: **Parallel**

Towards a combined α_s and m_t determination from a global PDF analysis

Monday 7 July 2025 09:02 (16 minutes)

The top mass is one of the fundamental parameters of the SM and is of key importance for numerous phenomenological applications, thus requiring a precise and accurate determination. In this work, based on the NNPDF4.0 framework, we determine m_t alongside the strong coupling α_s, while faithfully propagating experimental and theoretical uncertainties. Traditional approaches often ignore the possible interplay between theory uncertainties entering the parton distributions (PDFs) and the uncertainties in predictions derived from these PDFs. We show how the Theory Covariance Method is able to overcome this limitation, thereby providing a more accurate estimate of the uncertainties. We consider a wide range of inclusive, single and double differential LHC measurements benefiting from the full NNPDF dataset. We also account for missing higher order uncertainties (MHOUs), study the impact of various kinematic observables, and compare our findings against previous results in the literature. Our results pave the way towards an efficient combined determination of the PDFs alongside the (B)SM parameters.

Secondary track

T06 - Top and Electroweak Physics

Author: TER HOEVE, Jaco (University of Edinburgh)

Presenter: TER HOEVE, Jaco (University of Edinburgh)

Session Classification: T05

Track Classification: T05 - QCD and Hadronic Physics