Contribution ID: **796** Type: **Parallel session talk**

Compatibility between theoretical predictions and experimental data for top-antitop hadroproduction at NNLO QCD accuracy

Tuesday 22 August 2023 09:30 (20 minutes)

Duration: 15'+5'
We compare double-differential normalized production cross-sections for top-antitop + X hadroproduction at NNLO QCD accuracy, as obtained through a customized version of the MATRIX framework interfaced to PineAPPL, with recent data by the ATLAS and the CMS collaborations.

We take into account theory uncertainties due to scale variation and we see how predictions vary as a function of parton distribution function (PDF) choice and top-quark mass value, considering different state-of-the-art PDF fits with their uncertainties.

Notwithstanding the overall reasonable good agreement, we observe discrepancies at the level of a few sigma between data and theoretical predictions in some kinematical regions, which can be alleviated by refitting the top-quark mass values, and/or PDFs and/or alpha_s(M_Z), considering the correlations between these three quantities.

In a fit of top-quark mass standalone, we notice that, for all considered PDF fits used as input, some datasets point towards top-quark mass values lower by about two sigma than those emerging from fitting other datasets, suggesting a possible tension between experimental measurements using different decay channels, and/or the need of better estimating uncertainties on the latter.

Collaboration / Activity

Theory

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