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Epistemic uncertainty quantification in PDF fits

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Precise and accurate parton distributions are necessary to reach the physics goals of future colliders, from search for new physics to claims on non-perturbative QCD. In the last years, the CT group has expanded the concept of uncertainties in PDF analyses, in particular by including the concept of "sampling accuracy"in contrast to "fitting accuracy."The exploration of the sampling accuracy for PDFs was linked to the tolerance criteria for Hessian-based analyses, and a dimensional-reduction technique was proposed to assess similar sources of uncertainties for Monte Carlo-based analyses. The origin of the tolerance criteria is now understood in view of the large-scale analyses. Through outside-the-fit tests, we develop on the role of parametrization in global analyses. We also extended the discussion to the comparison of pulls between various experiments in Hessian and Monte Carlo based analyses, that is necessary to leverage the use of PDF ensembles.

Submitted on behalf of a Collaboration?

Yes

Participate in poster competition?

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