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Tests of performance of the fit in a global QCD analysis

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The span of uncertainties of the PDFs obtained in a global analysis depends on criteria for selection of acceptable PDF fits. I review several such criteria for estimating the goodness of fit in a large-scale analysis such as CT18, where they are applied in addition to the commonly used value of the global log-likelihood. On the example of CT18(Z) predictions for electroweak precision observables, I show that these tests offer in-depth insights about agreement among constraints from individual experiments and other such factors that ultimately determine the realistic PDF uncertainty. I compare two particularly helpful statistical techniques for this purpose, Lagrange Multiplier scans and Hessian sensitivities.

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