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Hessian PDF reweighting meets the Bayesian methods

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We discuss the Hessian PDF reweighting - a technique intended to estimate the effects that new measurements have on a set of PDFs. The method stems straightforwardly from considering new data in a usual χ^2 fit and it naturally incorporates also non-zero values for the tolerance, $\Delta\chi^2 > 1$. In comparison to the contemporary Bayesian reweighting techniques, there is no need to generate large ensembles of PDF Monte-Carlo replicas, and the observables need to be evaluated only with the central and the error sets of the original PDFs. In spite of the apparently rather different methodologies, we show that the Hessian and the Bayesian techniques are actually one and the same, but only if the $\Delta\chi^2$ criterion is properly included to the Bayesian likelihood function that is a simple exponential. We illustrate the situation by considering a simplified example and the case of inclusive jets at the LHC.

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