

Proton-PDF uncertainties in nuclear-PDFs fitting with p+Pb $W^\pm$ data

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We present a systematical study on proton-PDF uncertainties in the extraction of nuclear PDFs from $W^\pm$ production data in proton-lead collisions, using the theoretical covariance matrix and Hessian PDF reweighting methods to quantify the impact. We then discuss different ways to mitigate these theoretical uncertainties, including self-normalization, forward-to-backward and nuclear modification ratios, and charge asymmetries, indicating the advantages and disadvantages in each of these approaches. Finally, using a simple estimate on the achievable statistics at the LHC Run 3, we argue that propagating the proton-PDF uncertainties into nuclear PDF fits can become increasingly important in the future.

Submitted on behalf of a Collaboration?

No

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