



Experimental Inputs to PDFs from LHCb

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on behalf of the LHCb collaboration

WG1 Meeting - QCD

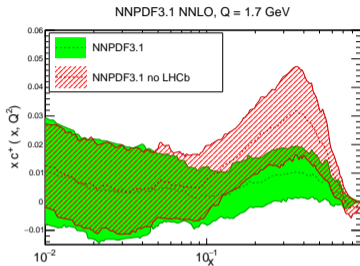
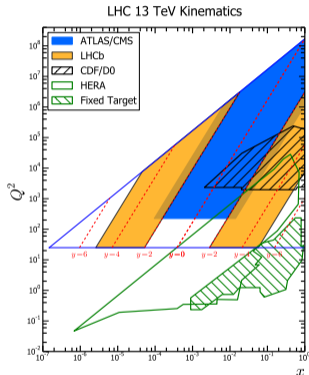
Friday, 2nd March 2018



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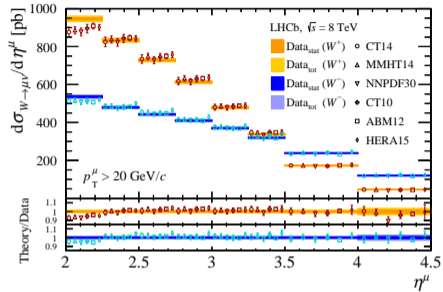
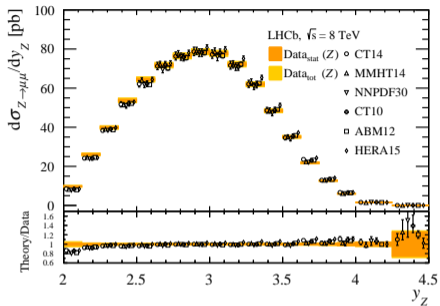
LIVERPOOL

introduction and motivation



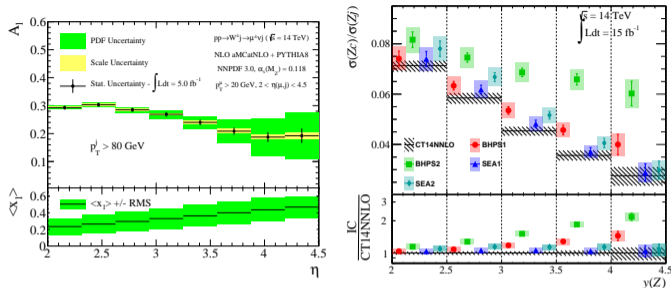
- by virtue of its acceptance, LHCb probes unique (x, Q^2) phase space for PDF constraints
- extra statistics can offer more reach into high- x region
- particle level studies planned to quantify what we expect with the HL-LHC statistics
 - extrapolate from current measurements where they exist, accounting for changes in efficiency/resolution due to detector / running conditions

inclusive W/Z measurements



- already have precise measurements of inclusive W/Z measurements
- however, more statistics would allow finer binning and probe most forward (pseudo-)rapidity bins
- double-differential in Z rapidity / p_T
- could also investigate high-mass Drell-Yan, close to kinematic limit

associated W/Z production



- two phenomenological studies already exist which show potential of LHCb to perform PDF constraints
 - W +jet - constraints on d PDF using asymmetry [*Phys. Rev.* (2016) D93:p. 014008]
 - Z + c -jet - constraints on intrinsic charm [*Phys. Rev.* (2016) D93:p. 074008]
- studies can be extrapolated to HL-LHC statistics
 - W + c -jet/ W + D at LHCb can also provide strange quark constraints
- $t\bar{t}$ measurements will also contribute large- x gluon constraints

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