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Graphical comparison of the LHCb measurements of W and Z boson production with ATLAS and CMS

The accompanying note is available here (LHCb-CONF-2013-005) [↗](#).

More detailed information: ANA note 2013-020 [↗](#)

Abstract

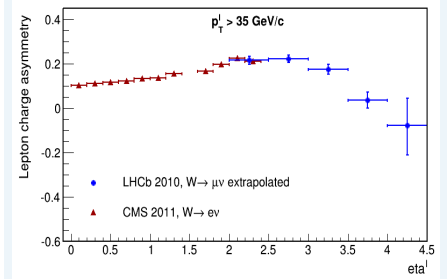
Differential production cross-sections for the W boson as a function of the pseudorapidity of the lepton and for the Z boson as a function of the rapidity of the Z boson measured by LHCb are compared graphically to those measured by ATLAS and CMS. A similar comparison is made for the W lepton charge asymmetry as a function of the lepton pseudorapidity for different thresholds on the transverse momentum of the lepton. Correction factors are calculated at next-to-leading order to account for differences in the definition of the fiducial volumes of the measurements. The comparison plots show good agreement between the ATLAS and LHCb results as well as the CMS and LHCb results in the overlapping kinematic regions.

Figures

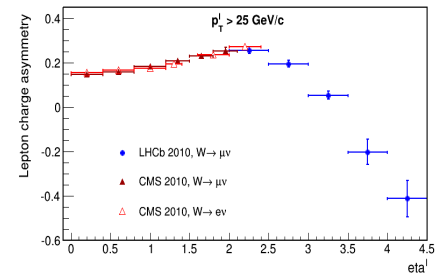
(Note, eps versions are available under attachments).

Caption	Figure
Differential production cross-section for Z boson as a function of the rapidity of the Z boson. The LHCb results in the muon and the electron channel are extrapolated to the fiducial volume of the ATLAS measurement ($66 < M_{ll} < 116 \text{ GeV}/c^2$, $p_T > 20 \text{ GeV}/c$) which is shown in green. This plot is purely for illustrative purposes, the published LHCb results should be used for all comparisons with theoretical predictions.	
Differential production cross-sections for W- and W+ bosons as a function of the lepton pseudorapidity. The LHCb results are extrapolated to the fiducial volume of the ATLAS measurement ($M_T > 40 \text{ GeV}/c^2$, $p_T > 25 \text{ GeV}/c$) which is shown in green. This plot is purely for illustrative purposes, the published LHCb results should be used for all comparisons with theoretical predictions.	
Lepton charge asymmetry as a function of the pseudorapidity of the lepton. The extrapolated LHCb result is shown in comparison to the result of ATLAS (top) for $M_T > 40 \text{ GeV}/c^2$. This plot is purely for illustrative purposes, the published LHCb results should be used for all comparisons with theoretical predictions.	

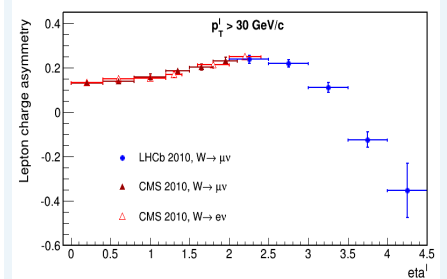
Lepton charge asymmetry as a function of the pseudorapidity of the lepton. The extrapolated LHCb result is shown in comparison to the CMS results with a p_T threshold of 35 GeV/c. This plot is purely for illustrative purposes, the published LHCb results should be used for all comparisons with theoretical predictions.



Lepton charge asymmetry as a function of the pseudorapidity of the lepton. The measured LHCb result is shown in comparison to the CMS results for a p_T threshold of 25 GeV/c. No extrapolation is applied here



Lepton charge asymmetry as a function of the pseudorapidity of the lepton. The measured LHCb result is shown in comparison to the CMS results for a p_T threshold of 30 GeV/c. No extrapolation is applied here



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