

Observation of nuclear modifications in W-+/- boson production in pPb collisions at root s(NN)=8.16 TeV

By: Sirunyan, AM (Sirunyan, A. M.)^[1]; Tumasyan, A (Tumasyan, A.)^[1]; Adam, W (Adam, W.)^[2]; Ambrogio, F (Ambrogio, F.)^[2]; Asilar, E (Asilar, E.)^[2]; Bergauer, T (Bergauer, T.)^[2]; Brandstetter, J (Brandstetter, J.)^[2]; Dragicevic, M (Dragicevic, M.)^[2]; Ero, J (Eroe, J.)^[2]; Del Valle, AE (Del Valle, A. Escalante)^[2] ...More

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Abstract

The production of W-+/- bosons is studied in proton-lead (pPb) collisions at a nucleon-nucleon centre-of-mass energy of root s(NN) = 8.16 TeV. Measurements are performed in the W-+/- -> mu(+/-)nu(mu) channel using a data sample corresponding to an integrated luminosity of 173.4 +/- 6.1 nb(-1), collected by the CMS Collaboration at the LHC. The number of positively and negatively charged W bosons is determined separately in the muon pseudorapidity region in the laboratory frame vertical bar eta(mu)(lab)vertical bar < 2.4 and transverse momentum p(T)(mu) > 25 GeV/c. The W-+/- boson differential cross sections, muon charge asymmetry, and the ratios of W-+/- boson yields for the proton-going over the Pb-going beam directions are reported as a function of the muon pseudorapidity in the nucleon-nucleon centre-of-mass frame. The measurements are compared to the predictions from theoretical calculations based on parton distribution functions (PDFs) at next-to-leading-order. The results favour PDF calculations that include nuclear modifications and provide constraints on the nuclear PDF global fits. (C) 2019 The Author(s). Published by Elsevier B.V.

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Author Information

Reprint Address:

Yerevan Physics Institute Yerevan Phys Inst, Yerevan, Armenia.

Corresponding Address: Sirunyan, AM (corresponding author)

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Addresses:

- + [1] Yerevan Phys Inst, Yerevan, Armenia
- [2] Inst Hochenergiephys, Vienna, Austria
- + [3] Inst Nucl Problems, Minsk, BELARUS
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