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Improving Constraints on Proton Structure using CMS measurements

Production of electroweak bosons, heavy quarks and jets in proton-proton collisions probe different aspects of QCD and are sensitive to the details of proton structure, expressed by parton distribution functions (PDFs). Precise measurements of cross sections of these processes are used by the CMS experiment to demonstrate the impact of the LHC data on the PDFs and their precision. The measurements of muon charge asymmetry in W-boson production at a center-of mass of 7 and 8 TeV is used to improve the constraints on the valence-quark distributions, while the associated production of W-boson and charm quark provides information on the s-quark distribution in the proton. Production of inclusive jets as measured by CMS at center-of-mass energy of 7 TeV provide important constraints on the gluon distribution and are used to determine the strong coupling constant.

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