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Measurements of the Vector boson production with the ATLAS Detector

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Content

Measurements of the Drell-Yan production of W and Z/γ bosons at the LHC provide a benchmark of our understanding of perturbative QCD and probe the proton structure in a unique way. The ATLAS collaboration has performed new high precision measurements at center-of-mass energies of 7 TeV. The measurements are performed for W^+ , W^- and Z/γ bosons integrated and as a function of the boson or lepton rapidity and the Z/γ^* mass. Unprecedented precision is reached and strong constraints on Parton Distribution functions, in particular the strange density are found. Z cross sections are also measured at a center-of-mass energies of 8 TeV and 13 TeV, and cross-section ratios to the top-quark pair production have been derived. This ratio measurement leads to a cancellation of systematic effects and allows for a high precision comparison to the theory predictions. The production of jets in association with vector bosons is a further important process to study perturbative QCD in a multi-scale environment. The ATLAS collaboration has performed new measurements of vector boson + jets cross sections, differential in several kinematic variables, in proton-proton collision data taken at center-of-mass energies of 8 TeV and 13 TeV, which will be presented. The measurements are compared to state-of-the art theory predictions. They are sensitive to higher-order pQCD effects, probe flavour and mass schemes and can be used to constrain the proton structure. In addition, we present a new measurement of the splitting scales of the kt jet-clustering algorithm for final states containing a Z-boson candidate at a centre-of-mass energy of 8 TeV.

Session

Proton structure, small and large x physics

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