



Contribution ID: 36

Type: **not specified**

Differential Drell-Yan measurements and Z/top-pair cross section ratios

Tuesday, 4 April 2017 10:06 (17 minutes)

Precision measurements of the Drell-Yan production of W and Z bosons at the LHC provide a benchmark of our understanding of perturbative QCD and electroweak processes and probe the proton structure in a unique way.

The ATLAS collaboration performed a precision Z/ γ^* measurement at a center of mass energy of 8 TeV in the di-lepton mass range up to the TeV scale. These are performed double-differentially in dilepton mass and rapidity or dilepton mass and rapidity separation. The measurements are compared to state-of-the-art theory calculations and are found to bring strong constraints on the high x partons and the poorly constrained photon content of the proton.

Z cross sections are also measured at a center-of-mass energies of 8TeV and 13TeV, and cross-section ratios to the top-quark pair production have been derived. This ratio measurement leads to a cancellation of several systematic effects and allows therefore for a high precision comparison to the theory predictions.

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Session Classification: WG1 Structure Functions and Parton Densities

Track Classification: WG1) Structure Functions and Parton Densities