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Measurement of the charged and neutral current DY process, forward-backward asymmetry and the determination of the weak mixing angle with the ATLAS detector

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Result of merged abstracts:

Charged and neutral current Drell Yan cross sections are sensitive to the parton distribution functions of the proton and electroweak corrections. The measurements of the neutral current DY process in three distinct kinematic regions, i.e. at the Z boson mass peak, below and above, are performed by the ATLAS collaboration using 7 TeV proton-proton collision data. The results are compared to NLO Monte Carlo simulations and to NNLO QCD predictions corrected for NLO EW effects calculated using various parameterizations of the parton distribution functions.

A measurement of the forward-backward asymmetry for the neutral current Drell Yan process is presented. The asymmetry is measured using dielectron and dimuon final states with $\sqrt{s} = 7$ TeV data collected by the ATLAS detector. For the dielectron channel, the measurement includes electrons detected in the forward calorimeter which extends the covered phase space to the region less sensitive to the uncertainties of the parton density functions. The forward-backward asymmetry spectra in all channels are found to be consistent with the corresponding Standard Model predictions. The results are then used to extract a measurement of the effective weak mixing angle. The result is compared with the measurements from LEP, SLD, D0, CDF and CMS.

Summary

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