

# Precision measurements of electroweak observables with the ATLAS Detector

Monday 28 August 2017 17:00 (30 minutes)

Measurements of the Drell-Yan production of  $W$  and  $Z/\text{gammabosons}$  at the LHC provide a benchmark of our understanding of perturbative QCD and probe the proton structure in a unique way. The ATLAS collaboration measured the di-lepton mass range up to the TeV scale as well as the triple differential cross-section measurement as a function of  $M_{ll}$ , dilepton rapidity and  $\cos\theta$  defined in the Collins-Soper frame. This measurement provides sensitivity to the PDFs and the weak mixing angle. The latest results of the ATLAS collaboration will be presented.

A second important observable in the electroweak sector is the  $W$  boson mass in order to test the overall consistency of the Standard Model. Since the discovery of a Higgs Boson, the  $W$  boson mass is predicted to 7 MeV precision, while the world average of all measurements is 15 MeV, making the improved measurement an important goal. Large samples of leptonic decays of  $W$  and  $Z$  bosons were collected with efficient single lepton triggers in the 7 TeV data set corresponding to an integrated luminosity of 4.6/fb. With these samples the detector and physics modelling has been studied in great detail and enabled a  $W$  boson mass measurement with a precision of 19 MeV, which will be presented in this talk.

**Author:** ROZEN, Yoram (Technion (IL))

**Presenter:** VITTORI, Camilla (Universita e INFN, Bologna (IT))

**Session Classification:** Hard QCD and EW