

# Measurements of Drell-Yan transverse momentum, lepton azimuthal decorrelation and angular distributions with the ATLAS detector (20+10min)

Friday, 4 September 2015 14:00 (30 minutes)

The ATLAS Collaboration has performed precision measurements of the transverse momentum of Z/ $\gamma$  bosons and their decay lepton angular decorrelation with the  $\phi$  observable. Measurements have been performed at 7 and 8 TeV in different dilepton invariant mass and rapidity regions. These measurements are sensitive to soft resummation effects and hard jet emissions for small and large momentum transfers, respectively, probing QCD in a unique way. The ATLAS Collaboration is engaged in precision measurement of fundamental Standard Model parameters, e.g. the weak mixing angle and the complete set of coefficients that describe the angular distributions of Drell-Yan production. A measurement of the forward-backward asymmetry for the neutral current Drell-Yan process is presented and the results are then used to extract a measurement of the effective weak mixing angle. This measurement shows significant sensitivity to the uncertainties of the parton density functions of the proton. The angular distributions of the Drell-Yan lepton pairs around the Z-boson mass peak probe the underlying QCD dynamic of the Z-boson production mechanisms. We present a measurement of the complete set of angular coefficients describing these distributions and compare to theoretical predictions highlighting different approaches of the QCD and EWK modeling.

**Primary author:** FERRARI, Arnaud (Uppsala University (SE))

**Co-author:** PADILLA ARANDA, Cristobal (IFAE-Barcelona (ES))

**Presenter:** LIN, Tai-Hua (Johannes-Gutenberg-Universitaet Mainz (DE))

**Session Classification:** HardQCD+PDFs: Joint session

**Track Classification:** Hard QCD