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Study of W and Z production, lepton charge asymmetry and Z differential cross sections at CMS (15'+5')

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We present various measurements with W and Z bosons, based on 36 inverse-picobarns of pp collisions at $\sqrt{s} = 7$ TeV recorded by the CMS detector at the LHC in 2010. The results, obtained in the electron and muon channels, are compared to predictions at the NLO or NNLO in QCD using recent sets of parton densities. We first report on the inclusive W- and Z-boson production cross sections, measured in the acceptance of the detector as well as extrapolated to the full acceptance. The main uncertainty on the cross sections is 3.4%, from the integrated luminosity measurement. Other systematic uncertainties are comparable to the statistical uncertainties, of the order of 1 to 2%. We also present measurements of the lepton charge asymmetries in W events, covering the central pseudo-rapidity region up to 2.4 for electrons and 2.1 for muons. The size of the total experimental error in each bin of lepton pseudo-rapidity is comparable to the theory uncertainty due to the parton densities. Finally we present corrected and unfolded measurements with Drell-Yan pairs: transverse momentum and rapidity differential cross sections in the Z mass region ($60 < M(\ell\ell) < 120$ GeV) in the di-electron and di-muon channels, and Drell-Yan invariant mass spectrum from 15 to 600 GeV in the di-muon channel.

Presenter: YOO, Hwidong (Purdue University)

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