



LHC Seminar

SPEAKER: Marco Zanetti (Massachusetts Inst. of Technology (US))

TITLE: **From Van der Meer scans to precision cross section determination: the CMS luminosity and W/Z cross section measurements at $\sqrt{s}=8$ TeV**

DATE: Tue 20/05/2014 11:00

PLACE: Main Auditorium

ABSTRACT

The production of W and Z bosons is one of the most prominent examples of hard scattering processes at hadron colliders. The precise assessment of the corresponding inclusive cross sections provide tests of perturbative QCD and validate the theoretical predictions of higher order corrections. An accurate luminosity determination is instrumental for this and all the other cross section measurements.

The LHC experiments made tremendous steps forward in the comprehension

of the subtleties related to luminosity monitoring and calibration (the latter based on the beams scan technique originally proposed by Van der Meer), which led to an unprecedented accuracy at a hadron collider.

In this seminar the measurement performed by the CMS experiment of total and fiducial inclusive W and Z boson production cross sections at $\sqrt{s}=8$ TeV will be presented; electron and muon final states are considered from a data set recorded in dedicated conditions and corresponding to an integrated luminosity of 18.2 pb⁻¹. Details about the analysis that allowed bringing the luminosity uncertainty down to 2.6% will also be given.