ID de Contribution: **870** Type: **Parallel session talk**

Measurement of single top production in pp collisions at 7 TeV with the CMS detector

jeudi 21 juillet 2011 10:10 (20 minutes)

We present a measurement of the inclusive single top production cross section in proton-proton collisions at the LHC at a centre-of-mass energy of 7 TeV, using data collected with the CMS experiment during the year 2011. The analysis considers decay channels where the W from the top decays into electron-neutrino or muon-neutrino, and makes use of kinematic characteristics of electroweak single top production for the separation of signal from backgrounds using multivariate methods. The result, which supersedes an earlier measurement based on 2010 data, is compared with the most precise standard model theory predictions. We also present measurements of various differential single top quark production cross sections.
In addition, we present the first measurement of single top quark production in the tW-channel in pp collisions, in which a top quark is produced in association with a W boson. The experimental signature is similar to top pair production, and there is interference at higher orders between the two processes. The measurement is performed using final states in which the associated W boson as well as the one originating from the top quark decay leptonically. Multivariate methods are used to extract the cross section. The result is compared with current standard model theory predictions.

Auteurs principaux: IORIO, Alberto Orso Maria (stituto Nazionale di Fisica Nucleare (INFN)); Dr KRAMMER, Manfred (HEPHY)

Orateur: IORIO, Alberto Orso Maria (stituto Nazionale di Fisica Nucleare (INFN))

Classification de Session: Top and Electroweak Physics

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