



# LHC Seminar

SPEAKER: Dr. Ronan McNulty (University College Dublin (IE))

TITLE: **Central exclusive quarkonium production at LHCb**

DATE: Tue 04/02/2014 11:00

PLACE: Salle Dirac

## ABSTRACT

Central exclusive production is a class of reactions in which one or two particles are produced but the colliding hadrons emerge intact. At the LHC this leads to an unusual and distinctive topology of low multiplicity events contained in a small rapidity interval with large rapidity gaps on either side, characteristic of a colourless propagator.

This talk will focus on a recent measurement by the LHCb collaboration of the cross-section for central exclusive  $J/\psi$  and  $\Psi(2S)$  meson production in proton-proton collisions at  $\sqrt{s}=7$  TeV. Using an integrated luminosity of  $930\text{pb}^{-1}$ , samples of 56,000  $J/\psi$  and 1500  $\Psi(2S)$  mesons have been reconstructed through their decays to muon pairs. Non-resonant backgrounds are very small but resonant backgrounds in which one or both of the colliding protons dissociate are substantial, and are investigated in detail.

The measured integrated and differential cross-sections are compared to several theoretical predictions. The data are sufficiently sensitive to distinguish between LO and 'NLO' predictions. The forward reach of the LHCb detector probes small values of  $x$ , and these results can be used to constrain the gluon PDF down to  $x=5E-6$ . The data are also compared to models that include saturation effects, which may become important at such low  $x$ -values. Comparisons are also made to photoproduction results from HERA and fixed target experiments.

Finally, prospects for future central exclusive production measurements at LHCb will be discussed.

Organised by: M. Mangano, C. Lourenco, G. Unal.....  
\*\*Tea and Coffee will be served at 10h30\*\*