



LHC Seminar

SPEAKER: Yanxi Zhang

TITLE: **Searches for baryons with multiple heavy quarks at LHCb**

DATE: 11 Jul 2017, 11:00

PLACE: 503-1-001 - Council Chamber

ABSTRACT

Hadrons are systems bound by the strong interaction, which is described at the fundamental level by quantum chromodynamics (QCD). While QCD is well understood at high energy in the perturbative regime, low-energy phenomena, such as the binding of quarks and gluons within hadrons, are more difficult to predict. High precision measurements are then of paramount importance to test the reliability of several models and computational techniques, such as constituent-quark models or lattice-QCD calculations, in predicting the mass spectrum and the properties of hadrons. Owing to its excellent capabilities with particle identification, tracking and vertex reconstruction, LHCb is in a unique position to make significant contributions to the sector of particle spectroscopy. For example, five narrow structures have been recently observed in the $\Xi_c^+ K^-$ mass spectrum, consistent with excited Ω_c^0 states, composed of a charm quark and two strange quarks. Despite the fact that the quark model predicts the existence of baryons with multiple heavy quarks, these have not been clearly observed yet. For this reason, baryons containing different configurations of two heavy quarks, for example two charm or two beauty quarks or a beauty and charm quark, are being actively searched for. In the early 2000s the SELEX collaboration announced the observation of a candidate baryonic particle containing two charm quarks, but its existence was not confirmed by several subsequent experiments. The unambiguous observation of such particles, and the precise measurement of their properties, would allow precise tests of QCD to be performed. The latest findings by the LHCb experiment, including results obtained from Run-2 data of the LHC, are presented in this seminar.

Organised by: M. Mangano, C. Lourenco, G. Unal.....
Refreshments will be served at 10h30