Contribution ID: **114** Type: **not specified**

Heavy-flavour production as a function of multiplicity in pp and p-Pb collisions with the ALICE detector at the LHC

Friday 5 December 2014 14:40 (20 minutes)

"The measurement of heavy-flavour production cross sections in pp collisions at the LHC represents a test for pQCD calculations and provides a reference for heavy-ion studies. The study of heavy-flavour production as a function of multiplicity of charged particles produced in the collisions could give insight into the role of multi-parton interactions (MPI) and on the interplay between hard and soft mechanisms for particle production. In p-Pb collisions, heavy-flavour measurements allow us to estimate the relevance of initial state effects due to the presence of the nucleus in the collisions. Cold nuclear matter effects can also be studied for different multiplicity classes to understand their relation with the number of particles produced in the collisions and with the collision geometry.

The talk will be focused on the measurement of open heavy-flavour production as a function of charged-particle multiplicity in pp collisions at $\sqrt{s}$ = 7 TeV and p-Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV recorded with the ALICE detector in 2010 and 2013, respectively. D-mesons are reconstructed from their hadronic decay channels in the central rapidity region, and their yields are measured in different multiplicity and $p_{\rm T}$ intervals. The per-event yield of D-mesons, in different multiplicity intervals, normalised to its multiplicity-integrated value, will be compared for pp and p-Pb collisions to study the effect of MPI on open charm production in both collisions system. Also the D meson transverse momentum distributions in p-Pb collisions relative to pp collisions, in different multiplicity classes, will be shown.

The results on D mesons will be also compared to the same observable measured for the J/ψ mesons, in order to investigate whether similar or different production mechanisms related to multi-parton interactions and event activity play a role for open and hidden charm production at the LHC."

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Session Classification: Cabernet-2