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Heavy-flavour production as a function of multiplicity in pp and p-Pb collisions

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The measurement of heavy-flavour production cross sections in pp collisions at the LHC provides a reference for heavy-ion studies and represents a test for perturbative QCD calculations. In p-Pb collisions, heavy-flavour measurements are essential to assess the effects due to the presence of a nucleus in the initial state, such as the modification of the parton densities and the k_{T}-broadening resulting from multiple soft scatterings of the partons.
Heavy-flavour measurements as a function of the multiplicity of charged particles produced in the collision are sensitive to the interplay between hard and soft contributions to particle production and, in particular, could give insight into the role of multi-parton interactions (MPI), i.e. several hard partonic interactions occuring in a single collision at high centre-of-mass energies.

In this talk we will focus 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 $\sqrt{s_{\mathrm{NN}}}$=5.02 TeV recorded with the ALICE detector in 2010 and 2013, respectively. D^0, D^+ and D^{*+} are reconstructed from their hadronic decay modes in the central rapidity region, and their yields are measured in different multiplicity and p_{T} intervals.

The per-event yield of D mesons in the different multiplicity intervals, normalized to its multiplicity-integrated value, and its evolution with p_{T} will be compared for pp and p-Pb collisions to study the contribution of MPI to open charm production in the two systems.
The nuclear modification factor of D mesons in p-Pb collisions, defined as the ratio of the D-meson yield in p-Pb and pp collisions scaled by the number of binary collisions N_{coll}, will be discussed in terms of its multiplicity dependence.
Results obtained with different multiplicity estimators will be shown in order to better understand the connection between multiplicity and collision geometry, which is needed to determine N_{coll}.

On behalf of collaboration:

ALICE

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