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D⁺-meson production as a function of charged-particle multiplicity in p–Pb collisions with ALICE

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The measurement of heavy-flavour production cross sections in pp collisions at the LHC has provided a reference for heavy-ion studies and a test for perturbative QCD calculations. Moreover the LHC has started the Run 2 operations this year, and the study of D-meson production in pp collisions at $\sqrt{s}=13$ TeV could provide a measurement of heavy-flavour production cross section at an unprecedented energy. 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.

In this poster we will focus on D⁺-meson measurements as a function of the multiplicity of charged particles produced in the collision. These measurements are sensitive to the interplay between hard and soft contributions to particle production in p–Pb collisions and, in particular, could give insight into the role of multi-parton interactions (MPI), i.e. several hard partonic interactions occurring in a single collision at high centre-of-mass energies. The measurement is performed in p–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV recorded with the ALICE detector in 2013. D⁺ mesons are reconstructed in their hadronic $K^- \pi^+ \pi^+$ decay channels 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. 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 event activity dependence.

On behalf of collaboration:

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