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## Open heavy-flavour production in p-Pb collisions measured with ALICE at the LHC

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Heavy quarks (charm and beauty) are probes of the Quark-Gluon Plasma (QGP) formed in high-energy nuclear collisions. They are produced in hard partonic scattering processes occurring in the initial stage of the collisions, propagate through the medium, and interact with its constituents, thus probing the entire evolution of the system.

The heavy-flavour production in proton-nucleus collisions is sensitive to Cold Nuclear Matter effects (CNM), such as the modification of the parton distribution functions of nuclei due to shadowing or saturation, and parton energy loss in cold nuclear matter. These effects can induce a modification of the heavy-flavour production at low momentum and their measurement is required to understand final-state effects related to the presence of the QGP in Pb-Pb collisions.

The study of heavy-flavour production as a function of the multiplicity of charged particles produced in the collision can provide information on the dependence of CNM effects on the collision geometry and on the density of final-state particles.

In addition, the possible presence of collective effects in high-multiplicity p-Pb events could modify the  $p_T$  distributions of heavy-flavour hadrons.

ALICE measures open heavy-flavour production via the reconstruction of D-meson hadronic decays and electrons from heavy-flavour hadron decays at mid-rapidity, and of muons from heavy-flavour hadron decays at forward rapidity. Recent results in p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV collected during the Run-1 and Run-2 LHC periods will be presented. In particular, the production cross sections, nuclear modification factors (down to  $p_T = 0$  for  $D^0$  mesons), and multiplicity-dependent studies will be shown. The results will be compared with theoretical model predictions.

### Experimental Collaboration

ALICE

**Primary author:** ALICE COLLABORATION

**Presenter:** TERREVOLI, Cristina (Universita e INFN, Padova (IT))

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