

Results on heavy-flavour production in pp, p-Pb and Pb-Pb collisions with ALICE at the LHC

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The primary goal of ALICE at the Large Hadron Collider (LHC) is to characterise the state of matter with partonic degrees of freedom, the Quark Gluon Plasma (QGP) produced in nucleus-nucleus collisions.

Heavy-quarks are considered efficient probes of the properties of the QGP since they are produced on a short time scale with respect to that of the QGP. Therefore, they are expected to traverse the strongly interacting medium and to lose energy through radiative and collisional processes. As a consequence of the interaction, the open heavy-flavour hadron spectra are modified with respect to those of proton-proton collisions at the same energy.

A quantitative understanding of the nucleus-nucleus results requires reference measurements in proton-proton and proton-nucleus collisions.

The study of heavy-flavour hadrons in proton-proton collisions is interesting not only as baseline for the heavy-ion collision measurement but also to provide an important test of perturbative QCD calculations. Furthermore, the study of open heavy-flavour hadron production as a function of the multiplicity of charged particles produced in the collision can give insights into multi-parton interaction phenomena.

Finally, the study of open heavy-flavour hadrons in p-Pb collisions is necessary to disentangle the hot and cold nuclear matter effects in Pb-Pb collisions.

In ALICE, open heavy flavours are studied through the reconstruction of D-meson hadronic decays at mid-rapidity, and via semi-electronic (at mid-rapidity) and semi-muonic (at forward rapidity) decays of charm and beauty hadrons.

A review of the main results on open heavy-flavour hadron production in pp collisions at $\sqrt{s} = 7$ TeV and Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV will be presented. The latest results obtained in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV will also be discussed.

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