



Contribution ID: 83

Type: **Contributed Talk**

Open heavy-flavour measurement in p-Pb and Pb-Pb collisions with ALICE at the LHC

Tuesday, 28 June 2016 14:40 (20 minutes)

The main goal of the ALICE experiment is the characterization of the Quark Gluon Plasma (QGP), the hot and dense matter created in high-energy nuclear collisions.

Heavy quarks (charm and beauty) are unique probes of the QGP because they are produced in hard partonic scattering processes occurring in the initial stage of the collisions, they propagate through the medium and interact with its constituents, thus probing the entire evolution of the system.

The heavy-flavour in-medium energy loss and elliptic flow are among the key observables to investigate the properties of the QGP, providing a test of the colour-charge and parton-mass dependence of in-medium energy loss and an effective tool to investigate to what extent heavy quarks participate in the collective motion in the medium.

The measurement of the heavy-flavour production in p-Pb collisions provides insight into the role of cold nuclear matter effects.

The ALICE detector provides precise tracking and vertexing and charged particle identification over a broad momentum range. These capabilities allow us to study open charm via the reconstruction of the D^0 , D^* , D^+ and D_s hadronic decay channels at mid-rapidity. Furthermore, open heavy-flavour production is accessible via semi-leptonic decays of charm and beauty hadrons, both at mid-rapidity (electrons) and at forward rapidity (muons).

In this contribution we will present the ALICE measurements of D-meson and heavy-flavour decay lepton production in Pb-Pb and p-Pb collisions. In particular, we will review the main results from recent publications of D-meson spectra and heavy-flavour decay lepton spectra, nuclear modification factors and elliptic flow in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV, in different collision centralities. We will discuss the comparison with the results obtained in p-Pb, with other hadron species and with theoretical model calculations. Furthermore, we will present results from an extension of the D^0 production measurement down to zero transverse momentum in p-Pb collisions and of the total charm production cross section at mid-rapidity. We will also introduce the prospects for open heavy-flavour analyses from Run 2 at the LHC.

On behalf of collaboration:

ALICE

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Session Classification: Heavy Quark Production