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Heavy-flavour production in pp collisions and correlations in pp and p-Pb collisions with ALICE at the LHC

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Heavy quarks (charm and beauty) are produced through hard parton scatterings in the initial stages of hadronic collisions. The study of their production in pp collisions constitutes a powerful tool to test perturbative QCD calculations at the LHC energies, where a region of phase space at low Bjorken- x can be accessed. Moreover, these measurements provide a reference for the study of nuclear matter effects on heavy quarks in Pb-Pb collisions, where a Quark-Gluon Plasma (QGP) is produced.

Further insight into the mechanisms through which heavy quarks are produced and fragment into hadrons can be obtained by studying the angular correlations between heavy-flavour particles and charged hadrons produced in pp collisions. The comparison of the angular correlation distributions with those measured in p-Pb collisions can also help to investigate possible modifications of the heavy-quark production and hadronization induced by the presence of cold nuclear matter effects in the latter collision system, besides constituting a reference for the interpretation of Pb-Pb measurements. A comparison of correlation measurements with theoretical predictions can also allow us to put constraints on the models describing heavy-quark production and hadronization.

Thanks to its excellent tracking and particle identification performance, the ALICE detector is capable of measuring D mesons at central rapidity via their hadronic decay channels down to very low transverse momentum, as well as leptons from heavy-flavour hadron decays at central and forward rapidity. We will present a review of ALICE measurements of heavy-flavour production in pp collisions at $\sqrt{s} = 7$ TeV and at $\sqrt{s} = 2.76$ TeV. In particular, we will show an extension of the prompt D^0 p_T -differential cross section down to zero transverse momentum, which allows us to measure the p_T -integrated charm production cross section at central rapidity, in pp collisions at $\sqrt{s} = 7$ TeV. In addition, we will discuss measurements of azimuthal correlations of prompt D^0 , D^+ and D^{*+} mesons with charged hadrons in pp collisions at $\sqrt{s} = 7$ TeV and p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV and compare the results with expectations from models.

On behalf of collaboration:

ALICE

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