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Charm production measurements in the dielectron channel with ALICE

Content

The measurement of charm production in hadronic collisions provides a powerful tool to understand QCD due to its creation in initial parton-parton interactions, with the heavy quark mass providing the hard scale for the process. At the LHC the measurement of the correlation of the produced $c\bar{c}$ quark pairs shows sensitivity to the production mechanisms at hand. The large branching ratios of open charm hadrons into leptons and the correlation of the decay lepton with its parent hadron make this decay channel well suited for these studies.

In this contribution the harvest of charm cross section measurements in proton-proton collisions with the ALICE detector in the dielectron channel will be presented. The extracted cross sections of charm and beauty production at $\sqrt{s} = 5.02$, 7, and 13 TeV will be reported and compared to model calculations. In particular the differences in the total cross section, using different implementations of heavy-flavour production mechanisms to extrapolate in phase space will be discussed. In addition, the measurements in the dielectron channel will be discussed, taking independent measurements of fully reconstructed open heavy-flavour hadrons into account.

Furthermore, we will compare the proton-proton measurement with the production in p-Pb collisions at the same center-of-mass energy. The impact of the presence of cold nuclear matter and its effects on the particle distribution functions which could modify the production of charm quark pairs will be addressed.

Summary

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