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Latest results on Λ_c and D production in pp and Pb-Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV with ALICE at the LHC

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Charm quarks are a powerful probe of the Quark-Gluon Plasma (QGP) formed in high- energy heavy-ion collisions. Produced in hard scattering processes on a timescale shorter than the QGP formation time, they experience the whole evolution of the medium interacting with its constituents. The measurements of charm-hadron production allows testing the mechanisms of in-medium parton energy loss. Moreover, the study of charm-baryon production in heavy-ion collisions and in particular the baryon-to-meson ratio, provides unique information on hadronisation mechanisms, constraining the role of coalescence and testing the predicted presence of diquark states in the medium. In particular, the Λ_c/D^0 ratio is expected to be enhanced with respect to the proton-proton baseline if charm quarks hadronise via recombination with the surrounding light quarks in the QGP. In this scenario, the presence of diquark bound states in the QGP could further increase the Λ_c production. Thus, charm baryons are ideal tools to investigate unexplored aspects of the QGP. The ALICE detector is well suited to detect charm baryons down to low $p_{\rm T}$ thanks to the excellent tracking capabilities and state-of-art particle identification. In pp and Pb-Pb collisions, Λ_c baryons are reconstructed in the hadronic decay channels $\Lambda_c \rightarrow pK^0_s$ and $\Lambda_c \rightarrow pK\pi$ by means of machine-learning methods.

In this contribution, the new ALICE results on charm-meson and baryon production from the 2018 Pb-Pb sample and from the 2017 pp sample will be shown. In the pp system, the measurement of Λ_c production as a function of charged-particle multiplicity will be discussed. In the Pb-Pb system, the measurement of the Λ_c production, n uclear modification factor and the Λ_c/D^0 ratio in central and semi-central events in a large transverse-momentum interval ($2 \leq p_{\rm T} \leq 24$ GeV/c) will be discussed together with the comparison with similar results in smaller collision systems. Moreover, the comparison of our results to theoretical models will be shown.

Finally, we will discuss the status and prospects for the Ξ_c and Σ_c analyses.

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