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Study of charm fragmentation with charm meson and baryon angular correlation measurements with ALICE

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Fragmentation functions, which describe the fraction of the heavy-quark momentum carried by the heavy-flavour hadron, are one of the key components of the factorisation theorem used to calculate heavy-flavour hadron production cross-sections. Such functions are typically parametrised exploiting measurements performed in e^+e^- and e^-p collisions, under the assumption of fragmentation as a universal hadronisation mechanism across leptonic and hadronic collision systems. However, measurements of charm-hadron spectra and of the ratios of charmed-hadron abundances in pp collisions at LHC have proved that the fragmentation of heavy quarks into the different hadron species differ in hadronic and leptonic collisions.

In this talk, we present measurements of differential observables that consider the surrounding hadronic population in addition to the heavy-flavour hadron itself. These measurements allow for a closer connection to the charm fragmentation functions and put stronger constraints on the properties of hadronisation in hadronic collisions.

In particular, we report the results of angular correlations between D mesons and charged particles in pp collisions, including the first studies with Run 3 data. We will also show the comparison between charm meson angular correlations with charged particles and charm baryon (Λ_c^+) correlations in pp collisions. Such measurement will give insights on the differences of the charm fragmentation between charm baryons and mesons. We also present the final measurement of the fraction of longitudinal momentum of jets carried by Λ_c^+ baryons in pp collisions at $\sqrt{s} = 13$ TeV.

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