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D + meson production as a function of charged-particle multiplicity in pp collisions at $\sqrt{s} = 13$ TeV with ALICE

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Charm and beauty are heavy quarks with observed masses of 1.28 GeV/c and 4.18 GeV/c respectively. They are produced in initial hard scattering processes. Due to their small formation time ($\Delta t \sim 0.1$ fm/c) as compared to the formation time of QGP ($\Delta t \sim 0.3$ fm/c) at the LHC, they experience all the stages occurring during the time evolution of the hot and dense medium produced in heavy-ion collisions. Therefore, the measurement of open charm and beauty production allows probing QGP properties and investigating the color charge and mass dependence of the parton in-medium energy loss. Moreover, due to their large masses ($m_c, m_b \gg \Lambda_{\text{QCD}}$) their pp production cross-sections are calculable within the domain of perturbative QCD constituting an excellent test of pQCD calculations.

The study of D-meson yield in pp collisions as a function of charged-particle multiplicity helps to understand the processes involved in the production of charm quarks. Moreover, analyzing the charm production processes could help in learning the basic differences between hard and soft processes of particle production. Along with that, they also serve as a reference for the similar measurements in p-Pb and Pb-Pb collisions.

In this contribution, D + meson yield as a function of charged-particle multiplicity will be presented. Furthermore, the comparison with J/ψ yield at 7 TeV, 13 TeV and to D + -meson yield at 7 TeV in pp collisions will be shown.

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