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Beauty production in small systems with ALICE at the LHC

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Measurements of the production of hadrons containing beauty quarks in pp and p-Pb collisions provide an important test of quantum chromodynamics calculations. They also set the reference for the respective measurements in heavy-ion collisions, where the properties of the quark-gluon plasma are investigated. The excellent particle identification, track and decay-vertex reconstruction capabilities of the ALICE experiment, together with machine-learning techniques for multi-class classification, are exploited to separate the non-prompt D mesons e non-prompt Λ_c baryons (i.e. produced in beauty-hadron decays) from that of prompt D and Λ_c (produced in the charm-quark fragmentation). These measurements allow investigating the production and hadronization of beauty quarks in pp and p-Pb collisions. Machine-learning techniques also permit for the first time the measurement of the non-prompt D^* polarization that provides a baseline for future studies in Pb-Pb, and the first analysis of the non-prompt D-meson fractions as a function of multiplicity in pp collisions at $\sqrt{s}$=13 TeV.

The beauty production is also investigated via the measurements of b-tagged jets in pp and p-Pb and pp collisions at $\sqrt{s_{NN}}$ = 5.02 TeV. The final results on the b-jet production, the nuclear modification factor R_{pPb}, and the fraction of b jets among inclusive jets down to p_T = 10 GeV/c, which is lower than in previous measurements of b jets done at the LHC, are discussed. The final measurements of the $b\bar{b}$ production cross section at midrapidity per unit of rapidity, compared to FONLL predictions and to NNLO calculations are also presented.

In-person participation

No

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