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Beauty measurement prospects with ALICE 3

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Heavy-flavour quarks (charm and beauty) are produced on a very short time scale in initial hard-scattering processes. They experience the entire evolution of the ultrarelativistic-collision which makes them excellent probes for the characterization of the quark-gluon plasma (QGP) formed in heavy-ion collisions.

In particular, the comparison between beauty and charm measurements is a crucial tool for testing our understanding of mass-dependent energy loss in heavy-ion collisions. Measurements of beauty production in pp collisions are important to test perturbative QCD (pQCD) calculations, as well as to provide the baseline for Pb-Pb measurements. In p-Pb collisions, beauty-production is crucial to isolate cold nuclear matter effects.

The design of the next-generation detector for the heavy-ion program at the LHC, ALICE 3, features extremely good vertex resolution, particle identification of a broad range, and a large rapidity coverage to enable high-precision measurements of beauty production and elliptic flow in AA and pp collisions.

In this poster, the reconstruction performances of beauty hadrons at ALICE 3 will be shown, focusing the attention on the exclusive hadronic decays $B^+ \rightarrow \bar{D}^0 \pi^+$ in pp and AA collisions.

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