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## Beauty production in $pp$ collisions at $\sqrt{s} = 13$ TeV using the ALICE detector at the LHC

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The measurement of the production of hadrons containing charm or beauty quarks in proton–proton ( $pp$ ) collisions provides an important test for perturbative quantum chromodynamics calculations ( $p$ QCD). The ALICE detector allows us to perform precise measurements of non-prompt D-meson production, which are an excellent tool to investigate the production of beauty quarks in  $pp$  collisions. In this contribution, recent results on the  $p_T$ -differential production cross section of D mesons originating from beauty-hadron decays (i.e. non-prompt D mesons) and their comparison with the equivalent results for prompt D mesons in  $pp$  collisions at a centre-of-mass energy of  $\sqrt{s} = 5.02$  and  $\sqrt{s} = 13$  TeV, will be presented. In addition, the non-prompt  $D^+/D^0$  and  $\{D_s^+\}/(D^0+D^+)$   $p_T$ -differential production yield ratios and the measurements of fragmentation fraction ratio of beauty quarks into strange and non-strange B mesons in  $pp$  collisions, to test their universality across different collision systems, will be presented. The results will also be compared with  $p$ QCD predictions and other theoretical models. To perform these measurements a machine-learning multiclass classification algorithm for the selection of the D mesons coming from beauty-hadron decays is employed.

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