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Measurement of B meson production fractions in proton-proton collisions at 13 TeV using hadronic open-charm and charmonium decays

This talk presents the first CMS measurements of the production fractions of B^+, B^0, and B^0_s mesons in proton-proton collisions at 13 TeV. The analysis is based on a dedicated 2018 data set collected with high-rate triggers, which enables the reconstruction of hadronic open-charm decays of B mesons (e.g., $B \to \pi D$), where the D mesons decay fully hadronically. These channels allow precise measurements of the production fraction ratios as functions of B meson kinematics within the CMS acceptance.

In addition to the measurement of the ratio of production fractions, we report differential measurements based on exclusive charmonium decays ($B \to XJ/\psi$, with X = K, $K^*(892)^0$, or $\phi(1020)$), which provide new insight toward understanding the pT dependence of B meson production, as indicated by recent results from LHCb and CMS. We also present a measurement of the fd/fu ratio to test isospin symmetry in B production, finding results consistent with isospin invariance within experimental uncertainties.

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