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Determination of total charm production cross-section in pp collisions at 5.02 TeV with the HonexComb project

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Studies of charm production in proton-proton (pp) collisions are essential to understand some of the most fundamental aspects of Quantum Chromodynamics. They also provide the baseline for interpretation of charm data from larger colliding systems. Over the last decade, the measurement of the production cross-sections of charm mesons and baryons in pp collisions has been at the centre of a wide experimental effort at the Large Hadron Collider (LHC). These cross-sections were measured over a wide transverse momentum and rapidity coverage, thanks to the complementary kinematic acceptance of the different LHC experiments. In this study, the measurements of the charm hadrons D^0 , D^+ , D_s^+ , Λ_c^+ and Ξ_c^0 performed by the ALICE, CMS and LHCb collaborations in pp collisions at the centre-of-mass energy $\sqrt{s} = 5.02$ TeV are combined in transverse momentum and rapidity, and, using the most recent theoretical calculations, are extrapolated to the full phase space to determine the total charm-quark production cross section $\sigma_{c\bar{c}}$. We will discuss the final result, which increases the existing tension between experimental data and fixed order calculations, together with comparisons to PYTHIA predictions.

Category

Experiment

Collaboration (if applicable)

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