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Measurement of electrons from heavy-flavour hadron decays in pp and p-Pb collisions with ALICE

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Measurement of electrons from heavy-flavour hadron decays in pp and p-Pb collisions with ALICE at the LHC

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Charm and beauty quark production in hadronic collisions occurs mostly in initial parton scattering processes with high virtuality. The measurement of heavy-flavour decay electrons in pp collisions with the ALICE detector represents therefore a crucial test of pQCD predictions on heavy-flavour production. At the same time, it provides an essential reference for measurements in Pb-Pb collisions, where heavy quarks are important probes for the investigation of energy-loss mechanisms in the Quark-Gluon Plasma. The influence of cold nuclear matter effects (e.g. gluon saturation, nuclear shadowing, and the Cronin effect) on the electron spectrum can be inferred from the analysis of p-Pb collisions.

ALICE makes use of its central barrel detectors TPC, TOF, TRD, and EMCal to identify electrons at mid-rapidity. From these, background electrons from decays of light mesons and photon conversions are subtracted, based on respective preceding ALICE measurements. The resulting yield of heavy-flavour hadron decay electrons is measured down to a transverse momentum of 0.5 GeV/c. In addition, the high precision vertex reconstruction with the Inner Tracking System allows for a separate determination of the electron yield from B-meson decays, either from displaced single electrons or from secondary vertices. Alternatively, the contribution from beauty-hadron decays to the inclusive spectrum of electrons from heavy-flavour hadron decays is determined via the azimuthal angular correlation between electrons and charged hadrons. Measurements of the pT-differential electron production cross sections from inclusive heavy-flavour hadron and B-meson decays in pp collisions at $\sqrt{s}$ = 2.76 and 7 TeV will be presented. Furthermore, a first look will be taken at the inclusive electron spectrum from heavy-flavour hadron decays in p-Pb collisions at $\sqrt{sNN}$ = 5.02 TeV.

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