

# Measurement of leptons from heavy-flavour decays with ALICE at the LHC

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Heavy quarks (charm and beauty) are essential probes of the evolution of the medium created in heavy-ion collisions, because heavy-quark production in high-energy collisions occurs early compared to the formation time of the strongly-interacting partonic matter. To quantify medium effects in AA collisions, one needs to study pp collisions and p–A collisions as references. Apart from providing the crucial reference for Pb–Pb collisions, the measurements of heavy-flavour production in pp collisions provide tests for perturbative QCD calculations. Measurements in p–A collisions can be used to study cold nuclear matter effects, such as modifications to the parton densities in nuclei,  $k_T$  broadening and energy loss in cold nuclear matter. The ALICE detector is dedicated to the study of the strongly-interacting partonic medium, produced in heavy-ion collisions. Thanks to excellent tracking, vertexing and particle-identification capabilities provided by ALICE, we have been able to measure electrons (muons) from semileptonic heavy-flavour hadron decays at mid (forward/backward) rapidity. Electrons are reconstructed and identified using several detectors at mid rapidity ( $< |\eta| < 0.9$ ), namely the Time Of Flight detector, the Time Projection Chamber, the Electromagnetic Calorimeter, and the Transition Radiation Detector. Muons are reconstructed using the muon spectrometer at forward rapidity ( $2.5 < \eta < 4$ ). In this talk, we present measurements of electrons and muons from heavy-flavour hadron decays at mid and forward rapidity with ALICE in pp ( $\sqrt{s} = 2.76$  TeV and  $\sqrt{s} = 7$  TeV), p–Pb ( $\sqrt{s_{NN}} = 5.02$  TeV) and Pb–Pb collisions ( $\sqrt{s_{NN}} = 2.76$  TeV). The measurements of production cross sections of leptons from heavy-flavour decays in pp, p–Pb and Pb–Pb collisions, the nuclear modification factor in p–Pb and Pb–Pb collisions and the azimuthal anisotropy in Pb–Pb collisions will be presented with theoretical model comparisons.

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