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Suppression of high-pt heavy-flavour particles in Pb-Pb collisions at the LHC, measured with the ALICE detector

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Content :

The ALICE experiment studies nucleus-nucleus collisions at the LHC in order to investigate the properties of QCD matter at extreme energy densities. The measurement of open charm and open beauty production allows to probe the mechanisms of heavy-quark propagation, energy loss and hadronization in the hot and dense medium formed in high-energy nucleus-nucleus collisions. In particular, in-medium energy loss is predicted to be different for massless partons (light quarks and gluons) and heavy quarks at moderate momentum. The ALICE apparatus allows us to measure open heavy-flavour particles in several decay channels and with a wide phase-space coverage.

We present the results on the nuclear modification factors for heavy flavour particle production in Pb-Pb collisions at sqrt(s_NN) = 2.76 TeV.

Using proton-proton and lead-lead collision samples at sqrt(s) =2.76 and 7 TeV and at sqrt(s_NN) = 2.76 TeV, respectively, nuclear modification factors R_AA(pt) were measured for D mesons at central rapidity (via displaced decay vertex reconstruction), and for electrons and muons from heavy flavour decays, at central and forward rapidity, respectively.

The large suppression observed in the high pt region, by a factor 2.5-4 in central Pb-Pb collisions with respect to the pp reference, indicates a strong in-medium energy loss of heavy quarks.

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