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Measurements of heavy-flavour nuclear modification factor and elliptic flow in Pb–Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV with ALICE

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Heavy quarks, i.e. charm and beauty, are sensitive probes of the medium produced in high-energy heavy-ion collisions. They are produced in the early stage of the collisions and are expected to experience the whole history of the collision evolution interacting with the medium constituents via both elastic and inelastic processes.

The nuclear modification factor (R_{AA}) and the elliptic flow (v_2) are two of the main experimental observables that allow us to investigate the interaction strength of heavy quarks with the expanding medium.

R_{AA} accounts for the modification of heavy-flavour hadron yields in Pb–Pb collisions with respect to pp collisions, after the proper binary collision scaling is applied on the latter system. The comparison of the R_{AA} of charm, beauty and light-flavour hadrons can provide information about the colour-charge and parton-mass dependence of the parton energy loss. v_2 is the second Fourier coefficient of the azimuthal distribution of particle momenta in the transverse plane with respect to the reaction plane. At low p_{T} it is sensitive to the degree of thermalization of heavy quarks in the deconfined medium, and at high p_{T} it carries information on the path-length dependence of in-medium parton energy loss.

The ALICE collaboration has measured the production and elliptic flow of open heavy-flavour hadrons via their hadronic and semi-leptonic decays to electrons at mid-rapidity and to muons at forward rapidity in Pb–Pb collisions.

Recent results will be discussed, and model calculations including the interaction of heavy quarks with the hot, dense, and deconfined medium will be confronted with the data.

On behalf of collaboration:

ALICE

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