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Measurements of heavy-flavour production and study of heavy-flavour jets via electrons in heavy-ion collisions with ALICE

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In relativistic heavy-ion collisions, heavy quarks (charm and beauty) are ideal probes to investigate the properties of the hot and dense colour-deconfined QCD matter, so called Quark-Gluon-Plasma (QGP). Heavy quarks are produced in initial hard partonic interactions, and they propagate through the QGP. A strong suppression of heavy-flavour hadron production has been observed in the most central heavy-ion collisions with respect to the expectation from binary-scaled pp collisions at intermediate and high p_T . This is ascribed to energy loss of heavy flavours via radiative and collisional processes in the dense matter. In addition, the positive v_2 (elliptic flow) observed at low p_T in semi-central heavy-ion collisions suggests that heavy quarks participate to the collective motion of the system. These results indicate strong interaction of heavy quarks in the medium. Further information of the interaction of heavy quarks in the QGP is obtained by measuring their production in different collisions energies. Measuring heavy-flavour jets allows for a more direct access to the initial parton kinematics and therefore provides an additional information on the energy loss and hadronisation of heavy quarks in the medium. The study of jets allows also to address the spatial distribution and kinematic properties of the radiative energy.

In this poster, recent ALICE measurements of the R_{AA} of electrons from heavy-flavour hadron decays in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV is shown. The result is compared with the R_{AA} measured at $\sqrt{s_{NN}} = 2.76$ TeV for discussing the energy dependence of the suppression and with theoretical predictions. In addition, we will present studies of heavy-flavour jets tagged with electrons from heavy-flavour hadron decays in p-Pb collisions, as an outlook for further study of QGP with heavy quarks.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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