

Measurement of D-meson nuclear modification factor and elliptic flow in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE at the LHC

Thursday, 13 July 2017 11:30 (20 minutes)

Open heavy-flavour mesons are a unique tool to study and characterize the properties of the Quark-Gluon Plasma (QGP), formed in heavy-ion collisions at high energy. Given their large masses, heavy quarks are produced in the initial stages of the heavy-ion collisions, and therefore they experience the whole system evolution, losing energy interacting with the medium constituents. Thus, the measurement of the nuclear modification factor (R_{AA}) of open heavy flavours can provide important information about the colour-charge and parton-mass dependence of the energy loss. In addition, the measurement of the elliptic flow (v_2) at low p_T can give insight into the participation of the heavy quarks in the collective expansion of the system and their thermalization in the medium. Moreover, the study of the v_2 at high p_T allows us to investigate the path-length dependence of parton energy loss. These two observables can also help us to understand possible modifications of heavy-quark hadronization in the medium. In particular, the role of the recombination mechanism can be studied via the comparison between D mesons with and without strange-quark content.

In this talk, the latest results on the production of D^0 , D^+ , D^{*+} and D_s^+ mesons at central rapidity measured via the exclusive reconstruction of their hadronic decays in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE will be presented. In particular, the p_T -differential R_{AA} and v_2 of D mesons measured for different centrality classes will be shown and compared to predictions from theoretical models. Finally, the Event-Shape Engineering (ESE) technique applied to the D-meson elliptic flow in semi-central Pb-Pb events will be also presented, to investigate the influence of initial geometry fluctuations to heavy-flavour production.

List of tracks

Heavy-flavour (open and hidden)

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Session Classification: Parallel Heavy flavour

Track Classification: Heavy-flavour (open and hidden)