

Open heavy-flavour measurements in Pb-Pb collisions with ALICE at the LHC

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The ALICE experiment at the LHC studies Pb-Pb, p-Pb, and pp collisions to investigate the properties of the high energy-density state of strongly-interacting matter, produced in Pb-Pb collisions, the so-called quark-gluon plasma (QGP).

Heavy quarks (charm and beauty) are unique probes, since they are produced in the initial hard scattering processes in the earliest phase of the collisions and interact strongly with the medium carrying trace of its properties to the final state. In particular, heavy quarks lose less energy than light quarks and gluons and exhibit a harder fragmentation.

The main results from LHC-Run 1 data related to open heavy-flavour production in Pb-Pb collisions will be discussed. Open heavy flavours are measured in ALICE via the full reconstruction of the charged decay particles of D mesons at mid-rapidity or via semi-electronic and semi-muonic decays of charm and beauty hadrons at mid-rapidity and forward rapidity, respectively. The measurements of the suppression of heavy-flavour particles with respect to pp collisions (nuclear modification factor) and of the elliptic flow bring insights into the energy loss mechanisms in the medium and the possible thermalization of charm quark.

The perspectives on open heavy-flavour measurements will be also presented.

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