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

The ALICE experiment studies the properties of the strongly-interacting matter created in high energy heavy-ion collisions. This state of deconfined matter, called Quark-Gluon Plasma (QGP), is predicted by Quantum Chromodynamics (QCD).

Heavy quarks are a powerful probe to investigate such a state of matter, since they are predominantly produced in hard scattering processes during the early stage of the collision and they pass through all the deconfined phase.

A mass and colour charge hierarchy is expected to be observed in the in-medium parton energy loss being smaller for heavy quarks than for light quarks and gluons. The energy loss and the transport coefficient (dynamical properties) of the QGP can be quantified via the nuclear modification factor R_{AA} , which is the ratio of the yield measured in Pb-Pb to that observed in pp scaled with the number of binary nucleon-nucleon collisions

In semi-central collisions, the spatial azimuthal anisotropy of the interaction region is transferred to a momentum anisotropy of the final state particles through the interactions among the medium constituents. The anisotropy is described by the second coefficient of the Fourier expansion, known as v_2 or elliptic flow. The elliptic flow of heavy-flavour particles provides insight into the degree of thermalization of the medium at low p_T and into the path length dependence of heavy quark in-medium energy loss at high p_T .

The ALICE experiment studies open heavy flavours via their hadronic and semi-electronic decays at mid-rapidity and the semi-muonic decay channel at forward rapidity.

In this talk recent results on open heavy-flavour nuclear modification factor and azimuthal anisotropy measurements will be presented.

Primary author: BIANCHIN, Chiara (University of Utrecht (NL))

Presenter: BIANCHIN, Chiara (University of Utrecht (NL))