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Measurement of $\mathrm{D_s}$-meson production in Pb-Pb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV with ALICE at the LHC

Tuesday 11 June 2019 18:45 (2 hours)

Open-charmed mesons are unique tools to study the properties of the Quark-Gluon Plasma (QGP) formed in ultra-relativistic nucleus-nucleus collisions. Charm quarks, due to their large mass, are produced in hard partonic scattering processes in the initial stages of the collision. Therefore, they experience all the phases of the QGP evolution propagating through the medium and losing energy interacting with its constituents.

Measurements of open-charmed meson production in presence of the QGP and their comparison with results obtained in pp collisions give important insights into this deconfined state of hadronic matter. In particular, the measurement of the nuclear modification factor R_{AA} of $\mathrm{D_s}$ mesons compared with that of non-strange D mesons can provide information about the charm-quark hadronization mechanism. If a fraction of charm quarks hadronizes via recombination with lighter quarks of the hot medium, the relative abundance of $\mathrm{D_s}$ mesons with respect to non-strange D mesons is expected to be larger in Pb-Pb than in pp collisions, at low and intermediate transverse momentum (p_{T}), due to the enhanced production of strange quarks in the QGP. Furthermore, the study of the $\mathrm{D_s}$-meson elliptic flow v_2 in semi-central collisions, together with that of non-strange D mesons, allows us to assess the participation of charm quarks in the collective expansion of the system and the transport properties of the charm quark in the hadronic medium.

In this poster the most recent results on the production of $\mathrm{D_s}$ mesons measured at mid-rapidity in Pb-Pb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV obtained by the ALICE Collaboration will be presented. In particular, the p_{T}-differential R_{AA} and v_2 of $\mathrm{D_s}$ mesons measured for different centrality classes will be shown, exploiting also the large data sample collected with ALICE at the end of 2018 and improved analysis techniques.

Collaboration name

ALICE

Track

Hadronisation and coalescence

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