Contribution ID: **58** Type: **Poster**

Measurement of $\mathrm{D_S}$-meson production in pp and Pb-Pb collisions with ALICE at the LHC

Heavy quarks, charm and beauty, due to their large masses, are produced in hard partonic scattering processes in the initial stages of the collision. In pp collisions, cross section measurements of open-charmed mesons are an essential test for the predictions of models based on perturbative QCD calculations. In Pb-Pb collisions open-charmed mesons allow us to study the properties of the Quark-Gluon Plasma (QGP), since heavy quarks experience all the phases of the QGP evolution propagating through the medium and losing energy interacting with the QGP 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 matter state. 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. 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 deconfined medium.

In this poster the most recent results on production of $\mathrm{D_s}$ mesons measured at mid-rapidity in pp and Pb-Pb collisions obtained by the ALICE Collaboration, exploiting also analysis techniques based on machine learning, 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 together with the production cross section of prompt and non-prompt $\mathrm{D_s}$ mesons in pp collisions.

Collaboration (if applicable)

ALICE

Track

Heavy Flavor and Quarkonia

Contribution type

Poster

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Track Classification: Heavy Flavor and Quarkonia