

## D meson reconstruction with ALICE: present results and future perspectives

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A hot and dense medium, made of deconfined quarks and gluons, the Quark Gluon Plasma (QGP), can be created in ultra relativistic heavy-ion collisions. Charm and beauty quarks are excellent probes to investigate its properties and its evolution, since they are mainly produced at the early stages of the collisions in hard partonic scattering processes. Hot and dense nuclear matter effects can be studied by comparing heavy flavour production in Pb-Pb, pp and p-Pb collisions. Proton-proton collisions are used as a reference, while p-Pb collisions provide a way to assess cold nuclear matter effects. The ALICE detector, thanks to its excellent tracking and vertexing capabilities, allows the full reconstruction of two and three body hadronic decays of  $D^0$ ,  $D^+$ ,  $D^{*+}$  and  $D_s^+$  mesons in the central rapidity region.

A major upgrade of the ALICE experiment is scheduled for the second long shutdown (LS2) of the LHC (2018-19). The upgrade of the readout of most of the detectors will allow to fully exploit the increase of Pb-Pb luminosity expected for the LHC Run 3: the goal of the Collaboration is to collect a sample of minimum-bias collisions 100 times larger than the sample expected before LS2. The installation of a new Inner Tracking System, composed of seven layers of pixel detectors, will provide an increase of the tracking spatial precision by a factor of about three and will allow for a substantial improvement of the current performances for what concerns the heavy flavour reconstruction capabilities, especially at low momenta. Furthermore, new observables will be accessible, like, for example, the full kinematic reconstruction of beauty hadrons ( $B^+ \rightarrow D^0\pi^+$  with  $D^0 \rightarrow K^+\pi^-$ ) and heavy flavour baryons ( $\Lambda^+c$  and also  $\Lambda_b$ )

In this talk the current results concerning open charm reconstruction will be presented and the expected perspectives for the future LHC Run 3 will be discussed.

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