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Measurement of D meson production in p-Pb collisions with the ALICE detector

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Measurement of D meson production in p-Pb collisions with the ALICE detector

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The ALICE Collaboration has measured the production of prompt D^0 , D^+ and D^{*+} mesons in Pb-Pb and pp collisions by fully reconstructing their hadronic decays. A large suppression of D meson yield in the most central Pb-Pb collisions with respect to the binary-scaled pp yield was observed in a broad p_T -range. This effect is consistent with the energy loss of charm quarks while they traverse the hot and dense medium formed in such collisions.

To come to a quantitative understanding of these results, it is important to disentangle hot nuclear matter effects from initial-state effects due to cold nuclear matter, such as modification of the parton distribution functions in the nucleus, in particular nuclear shadowing, and saturation effects.

Between January and February 2013, ALICE collected a data sample of minimum bias p-Pb collisions at $\sqrt{s_{NN}}=5.02$ TeV. The study of the D meson production in this collision system, where a hot nuclear medium is not expected to be formed, will quantify the role of initial-state effects.

In this talk, the first results on D meson production in p-Pb collisions obtained in the $D^0 \rightarrow K^- \pi^+$, $D^+ \rightarrow K^- \pi^+ \pi^+$, $D^{*+} \rightarrow D^0 \pi^+$ decay channels in the central rapidity region will be presented.

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