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Feasibility studies for the measurement of D-meson production in jets in pp and Pb–Pb collisions with ALICE at the LHC

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The production of heavy quarks (charm and beauty) is a process calculable in perturbative QCD. Heavy-flavour measurements provide valuable tests of QCD based models. Furthermore, since they are produced in the early stages of ultra-relativistic heavy-ion collisions, heavy quarks are an ideal probe to study the properties of the Quark-Gluon Plasma. Finally, due to the high collision energy, charm quarks are produced abundantly at the LHC.

D mesons can be used to identify jets containing charm quarks. The comparison of the distribution of the jet momentum fraction carried by D mesons in Pb–Pb and pp collisions is a key observable to spot possible modifications of charm-jet properties induced by the presence of the medium.

In this contribution, we report on the prospects for the measurement of D mesons in jets in pp and Pb-Pb collisions using the ALICE detector which have been studied through Monte Carlo simulations. These studies show the unique capability of the ALICE experiment to measure D mesons carrying a small fraction of jet momentum.

On behalf of collaboration:

ALICE

Primary author: OLIVEIRA DA SILVA, Antonio Carlos (Universidade de Sao Paulo (BR), Utrecht University (NL))

Co-author: AIOLA, Salvatore (Yale University (US))

Presenters: OLIVEIRA DA SILVA, Antonio Carlos (Universidade de Sao Paulo (BR), Utrecht University (NL)); AIOLA, Salvatore (Yale University (US))

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