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# Hard probes production in pPb collisions at LHCb

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Within the p-Pb data sample collected by the LHCb detector at  $\sqrt{s_{NN}} = 8.16$  TeV, a rich set of open charm hadrons is observed with abundant statistics.

Thanks to the LHCb forward acceptance that is complementary to general purpose detectors, with excellent performance in particle reconstruction and identification, these charm states are studied down to zero pT with overwhelming precision.

In this talk, we present latest measurements of charm mesons in pPb collisions by LHCb. Among them, comparisons between theory predictions and data regarding the double charm production are made. In addition, the collaboration has measured the  $\chi_c$  states and the Z boson in pPb data for the first time at the LHC, which are ideal probes for the so-called cold nuclear matter effect such as nuclear PDFs and comover interactions..

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