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Heavy ion and fixed target results at LHCb

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The LHCb experiment pioneered fixed target physics with LHC beams, thanks to the SMOG internal gas target. The forward geometry of the spectrometer are perfectly suitable for a fixed-target programme that, together with ion collisions, enables unique studies that shed light on cosmic ray physics as well as heavy ion physics. We present the first measurement of antiproton production in proton-helium (pHe) fixed-target collisions at the LHC, which is an input for the modelling of the antiproton flux measured by AMS, and the first measurement of charm production in pHe and pAr fixed-target collisions at the LHC, which is of interest both for discussions of intrinsic charm and as a baseline for future ion-ion collision studies for quark-gluon plasma physics. Using data taken in collider mode, we discuss recent pPb collision measurements of quarkonia and open charm states, which probe nuclear modifications down to low Bjorken- x , and the measurement of J/psi production in ultra-peripheral PbPb collisions. We conclude by outlining the upgraded version of the fixed-target, SMOG2.

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