Contribution ID: **82** Type: **Oral Presentation**

Charm hadron production in fixed-target collisions at the LHC

Charm production measurements at fixed-target energies at the LHC offer unique opportunities for hadronisation studies sensitive to the beam remnants, constraints on parton distribution functions of the proton and the nucleus including intrinsic charm as well as studies sensitive to deconfinement in nucleus-nucleus collisions.
LHCb pionneered charm production measurements in proton-nucleus and nucleus-nucleus collisions in Run 2. In Run 3, LHCb was upgraded with a dedicated gas injection system, SMOG2. This upgrade features a gas cell to boost fixed-target luminosity and a new system that allows the injection of non-noble gases. SMOG2 enables the collection of large datasets from proton-proton, proton-nucleus and lead-nucleus fixed-target collisions, including high-statistics samples of charm hadrons.

This presentation will cover results from Run 2, the first data collected with the SMOG2 system, as well as future prospects for charm measurements in upcoming fixed-target collisions.

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Session Classification: Parallel session

Track Classification: Heavy Ion Collisions and QCD Phases