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Status of the TWOCRIST project for a double-crystal fixed-target experiment in the LHC

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TWOCRIST is a proof-of-concept installation in the Large Hadron Collider (LHC) at CERN to assess the feasibility of double-crystal experiments. It is designed to provide critical input to a possible future experiment aiming to measure the dipole moments of short-lived charm baryons. A first bent crystal extracts particles from the LHC beam halo onto a target, at safe distances from the circulating beam. A second crystal installed immediately downstream induces magnetic spin precession in charmed baryons produced in the target. TWOCRIST aims to demonstrate the operational feasibility of such a configuration and to characterise the performance of bent crystals, a key component for any future experiment. It features a simplified but representative setup including both crystals, a movable fixed target within the LHC vacuum, and two tracking detectors housed in Roman Pots to observe channelled particles. The experiment was successfully installed in insertion region 3 of the LHC during the End-of-Year Technical Stop 2024/25 and has recorded first data in 2025. This contribution provides an overview of the current status of the TWOCRIST project, including hardware implementation, machine development studies, and the initial results.

Secondary track

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