Contribution ID: **940** Contribution code: **MOPS020** Type: **Poster Presentation**

The TWOCRYST fiber tracker: a detector to characterize precession crystals at the LHC

Monday 2 June 2025 16:00 (2 hours)

A fixed-target experiment using two bent crystals is proposed to study the magnetic and electric dipole moments of short-lived charm baryons with unprecedented precision in the LHC. This will be achieved exploiting crystal channeling into a first crystal to extract the beam halo and then into a 7 cm long silicon crystal capable of inducing a measurable spin precession to the particles of interest. TWOCRYST is a proof-of-principle machine test scheduled for 2025, to test this setup and address the feasibility of the final experiment under LHC beam conditions. One main goal is the study of the channeling efficiency in this long crystal at TeV energies, requiring a 2D detector in movable Roman pots. The TWOCRYST Fibre Tracker, coming from the LHC's ATLAS-ALFA experiment, is a high-precision tracking detector with ten layers of crossing scintillating fibers coupled to multi-anode photomultipliers, and read out using compact front-end electronics. Intense refurbishment work was required on to adapt the detector to the purposes of TWOCRYST. This contribution summarizes the tracker specifications as derived from beam dynamics simulations and the results of tests prior to its installation.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

Author: MACCANI, Chiara (European Organization for Nuclear Research)

Co-authors: VALENTINO, Gianluca (University of Malta); KORCYL, Krzysztof (Institute of Nuclear Physics Polish Academy of Sciences); HERMES, Pascal (European Organization for Nuclear Research); JAKOBSEN, Sune (European Organization for Nuclear Research)

Presenter: MACCANI, Chiara (European Organization for Nuclear Research)

Session Classification: Monday Poster Session

Track Classification: MC1 :Colliders and Related Accelerators: MC1.A25 Beyond Colliders