



ID contributo: 82

Tipo: oral

# TWOCRIST: A proof-of-principle machine test for a double-crystal fixed-target experiment at the LHC

*lunedì 9 settembre 2024 12:10 (15 minuti)*

As part of the Physics Beyond Colliders (PBC) study at CERN, the feasibility of using the Large Hadron Collider (LHC) for in-vacuum Fixed-Target (FT) experiments has been investigated. Bent crystals offer unique opportunities in this context due to their proven capability for advanced high-energy beam manipulations. In the so-called double-crystal setup, a first crystal deflects particles from the beam halo onto an in-vacuum target. A second crystal, positioned just downstream, deflects charged particles created in the target, inducing precession of short-lived baryons that cannot be measured using conventional magnets. The second crystal must induce a deflection of several mrad over a few cm. To demonstrate the feasibility of this complex scheme in the LHC conditions, and to evaluate the performance with beam in the multi-TeV energy range, a proof-of-principle setup named TWOCRIST, is planned for installation in the LHC and for operation in 2025. This paper presents the status of TWOCRIST and the studies planned in scope of the project.

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**Classifica Sessioni:** FCC & Channeling