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## Performance of a double-crystal setup for LHC fixed-target experiments

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The Physics Beyond Colliders (PBC) studies at CERN address the possibility to utilise protons in the Large Hadron Collider (LHC) for a fixed-target program beyond the colliding-beam physics. As part of PBC, a double-crystal test stand is considered for installation in the LHC off-momentum collimation Insertion Region (IR) 3. In this PBC experiment, a first silicon crystal deflects beam-halo protons from the main beam onto a fixed-target. A second crystal, providing bending angles in the mrad range, is located immediately downstream of the target to deflect target-produced secondary particles onto a detector that will measure the electric and magnetic dipole moments of short-lived baryons. The LHC test stand will serve as a proof-of-principle machine experiment to assess the performance of new crystals at LHC energies and to address a number of critical machine aspects related to this complex setup. In this paper, simulations in MAD-X and SixTrack are used to predict the performance of the proposed double-crystal layout for the LHC Run 3 test stand and the LHC Run 4 final experiment.

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### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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