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## Feasibility study of the Alice fixed-target experiment with HL-LHC lead ion beams based on crystal-assisted beam Halo splitting

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The Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN) is the world's largest and most powerful particle accelerator, colliding beams of protons and lead ions at energies up to 7 ZTeV. ALICE is one of the detector experiments optimized for heavy-ion collisions.

A fixed-target experiment in ALICE is considered to collide a portion of the beam halo, split using a bent crystal, with an internal target placed a few meters upstream of the detector. For proton beams, we have already demonstrated that such a setup provides satisfactory performance in terms of particle flux on target and that it can be safely operated in parallel to regular beam-beam collisions. On the other hand, in the case of lead ion beams, a beam halo is populated with nuclei of many species that may differ in charge, mass and magnetic rigidity, making such a scenario more challenging to operate. This paper summarizes our first considerations of the feasibility of a fixed-target layout at ALICE to be operated with lead ion beams in the LHC.

### Footnotes

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