

# Future prospective for bent crystals in accelerators

Wednesday, July 29, 2020 7:20 PM (20 minutes)

Bent crystals are a powerful mean for ultrarelativistic particles steering, achieving deflection equivalent to hundreds-tesla magnetic dipole in compact and zero-energy consumption devices. Currently, bent crystals are a candidate for the upgrade of LHC ion collimation. Novel experimental setups are being proposed, especially in the field of spin precession. Indeed, the unparallel steering power of crystals enables magnetic and electric dipole moment studies on fast decaying particles like charmed baryons. Axial phenomena such as stochastic deflection and new materials such as Ge are also being tested as innovative solutions for future hadronic and leptonic accelerators (FCC, ILC and muon colliders). In the laboratories of the University of Ferrara and INFN, several prototypes for such applications have been developed. Design of bending mechanisms and fabrication process for samples are described, as well as curvature and lattice quality measurements. Finally, results are presented regarding testbeams performed at H8 and H4 extracted beamline of SPS at CERN, where steering performances are tested on 180 GeV/c  $\pi^+$  and 120 GeV/c  $e^\pm$  beams.

## I read the instructions

## Secondary track (number)

**Primary author:** ROMAGNONI, Marco (Universita e INFN, Ferrara (IT))

**Co-authors:** BERRA, Alessandro (Universita & INFN, Milano-Bicocca (IT)); SYTOV, Alexei (Universita e INFN, Ferrara (IT)); MAZZOLARI, Andrea (Universita e INFN, Ferrara (IT)); BRIZZOLARI, Claudia (Università degli Studi dell'Insubria); DURIGHELLO, Claudia (Università di Padova); DE SALVADOR, Davide (Universita e INFN (IT)); BAGLI, Enrico (Universita e INFN, Ferrara (IT)); CAVOTO, Gianluca (Sapienza Universita e INFN, Roma I (IT)); BALLERINI, Giovanni (Universita & INFN, Milano-Bicocca (IT)); BANDIERA, Laura (Universita e INFN, Ferrara (IT)); SOLDANI, Mattia (Università degli Studi dell'Insubria & INFN Milano Bicocca); PREST, Michela (Universita & INFN, Milano-Bicocca (IT)); NERI, Nicola (Università degli Studi e INFN Milano (IT)); Dr CARTURAN, Sara (INFN-LNL); MAIOLINO, Tais (Universita e INFN, Ferrara (IT)); MASCAGNA, Valerio (Universita & INFN, Milano-Bicocca (IT)); TIKHOMIROV, Victor (BSU); HAURLAVETS, Viktor (Institut for Nuclear Problems, Belarusian State University); GUIDI, Vincenzo (Universita e INFN, Ferrara (IT))

**Presenter:** ROMAGNONI, Marco (Universita e INFN, Ferrara (IT))

**Session Classification:** Accelerator: Physics, Performance, and R&D for Future Facilities

**Track Classification:** 11. Accelerator: Physics, Performance, and R&D for Future Facilities