

# ON THE DEFLECTION OF HIGH ENERGY ELECTRONS AND POSITRONS BY A BENT CRYSTAL

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We apply our CRYSTAL code [1] to the simulation of possible experiments on particle deflection by a bent crystal at Mainz microtron MAMI and the external line of CERN SPS. We simulate 855 MeV, 600 MeV and 195 MeV electron beam deflection for the case of MAMI microtron and 120 GeV electron and positron deflection for the case of CERN SPS. For MAMI we observe both channeling and volume reflection effects in a short (15  $\mu\text{m}$ ) and strongly curved (up to 1.5 mrad) silicon crystal aligned along (111) planes. For CERN SPS we revealed the same effects in a 2 mm long silicon crystal, oriented along (110) planes. In addition, for the orientation along  $\langle 111 \rangle$  we obtained the effects of axial channeling, channeling in skew bent crystal planes as well as multiple volume reflection in a one bent crystal [2].

## References

1. Sytov, A. I. CRYSTAL simulation code and modeling of coherent effects in a bent crystal at the LHC / A. I. Sytov, V. V. Tikhomirov // Nucl. Instr. Meth. Phys. Res. B. – 2015. – Vol. 355. – P. 383–386.
2. Tikhomirov, V. V. Multiple volume reflection from different planes inside one bent crystal / V. V. Tikhomirov // Phys. Lett. B – 2007. – Vol. 655. – P. 217–222.