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Characterization of multi-strip crystal deflector for high energy proton beams by synchrotron radiation topography with angular scanning

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Currently, for the extraction and collimation of the proton beams at the large accelerators, bent silicon single crystals are used. The device for multiple deflection of the proton beam by several curved strips of silicon in the reflection mode has been developed recently. The device consists of several strips, divided by grooves, on the surface of a thick plate of silicon. Bending of the strips is achieved by internal stresses in the material due to the Twyman effect. Method of X-ray topography with angular scanning, performed at synchrotron radiation, was used for measurement of the bending of the individual strips of the deflector and the crystal as a whole. The measurement results are compared with the results obtained previously in the proton beam.

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