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Abstract

A new approach to focusing X-ray optics based on asymmetric inclined (or rotated inclined) diffraction has been experimentally studied. Using a linear longitudinal W-groove cut into the surface of an asymmetric silicon (111) diffractor perpendicularly to line intersection of its surface and crystallographic (111) planes, the out of diffraction plane (or sagittal) deviation of the X-ray diffracted beam has been measured for three angles of asymmetry and constant angle of inclination on BM 5 at ESRF for 0.1 nm wavelength. It was demonstrated that in the grazing emergence case the sagittal deviation increases with the increasing asymmetry angle. A discrepancy with theoretical value for the largest asymmetry angle and inhomogeneities in the contrast of the diffraction spot have been discussed.

D. Korytar,J.Hrdy, N. Artemiev, C. Ferrari and A. Freund: Sagittal X-ray beam deviation at asymmetric inclined diffractors, J. Synchrotron Rad. (2001). 8, 1136–1139