

MS38-P05**High resolution guinier powder diffractometer combined with multilayer optics**Stefan Griessl¹, Maximilian Reh¹, Thomas Holz², Reiner Dietsch², Norman Huber¹

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The Huber double radius Guinier camera G670 is characterized by its short measurement time and high-resolution diffractograms. In addition to the successfully working Johansson monochromators curved multilayer optics from AXO DRESDEN were tested. Measurements were carried out with Cu K α , Mo K α , and Ag K α radiation (8.0 keV, 17.4 keV, 22.1 keV). Thus, a direct comparison between Johansson monochromators and multilayer optics was possible in terms of signal-to-noise ratio, full-width at half maximum (FWHM) of the diffraction peaks and the quality criterion of Jenkins and Schreiner. Various substances were tested both as powder on a flat sample and in a capillary. The capillary measurements showed very high intensities, especially with the multilayer optics. The wavelengths of the X-radiation used, together with the excellent resolution, make pair distribution function analyses feasible. Hence, the used instrument enables fast and precise determination of all important parameters of a powder sample.

MS39- The use of x-rays and neutrons for experiments in nanoscience

Chairs: Dr. Rainer Timm, Prof. Jordi Arbiol

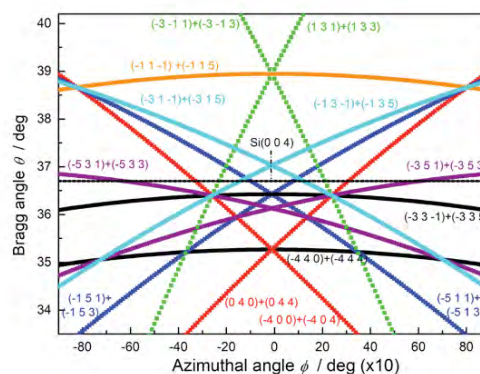
MS39-P01**Multiple Bragg reflections of neutrons related to a strong allowed reflection Si(004) in a cylindrically bent perfect crystal**Pavol Mikula¹, Jan Šaroun¹, Miroslav Vrána¹, Vyachelav Em²

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The experimental results of particular studies of multiple Bragg reflection (MBR) effects related to a strong Si(400) reflection in the cylindrically bent perfect crystal at the neutron wavelength of 0.162 nm are presented. It has been found that the MBR effects strongly depend on the diffraction geometry of the Si(004) planes with respect to the cut of Si slabs. Contrary to a common view that the MBR effects could be considered negligible or represent maximally a few percent of an effect related to a single allowed reflection, it has been found that in the case of a particular diffraction geometry their reflecting power can be comparable even much higher than the primary Si(004) reflection. For searching of the MBR effects, the azimuth–Bragg angle relationship for the 004 primary reflection in the diamond structure as displayed in the attached figure, was used. The horizontal dashed line corresponds to the Si(004) reflection for $\lambda=0.162$ nm.



Keywords: Neutron diffraction, bent perfect crystal, multiple reflection