o.m8.p5 **Determination of the chemical composition profile in As^+ implanted InGaAs/InP superlattice crystal by means of X-ray diffraction.** J. Gaca, M. Wojcik, A. Turos. *Institute of Electronic Materials Technology 01- 919 Warsaw, Wolczynska 133*
Keywords: surface crystallography structure.

A ten period superlattice crystal grown by MOCVD technique on (100) InP substrate has been investigated before and after As^+ ion implantation. The chemical composition profile parallel to the growth direction has been determined by means of a computer simulation of X-ray diffraction profile employing Darwin dynamical diffraction theory. The chemical composition of one modulation period of the investigated superlattice before the implantation has been found to consists the following number of monolayers: 45InP + 5InAs + $55In_xGa_{1-x}As$ + $5In_xGa_{1-x}P$ (x=0.524). This result has been confirmed by RBS. Next the sample was implanted with As^+ ions at 4 x 10^{13} dose and 1 MeV energy. The energy was chosen so that the maximum of radiation damage occurred in substrate crystal. It has been found that ion implantation has affected interplanar spacing modulation profile, leaving unchanged chemical composition profile. The average interplanar spacing, perpendicular to the surface, in the superlattice crystal after implantation has increased by 2.8% compared to that before the implantation. The simulation shows that this increase occurs in these parts of the superlattice crystal that contain As atomic planes, while in those containing P atomic planes a small decrease is observed. This can be explained by the existence of a residual coherency strain in the superlattice crystal.

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o.m8.p6 **Laterally structured surfaces of GaAs (001) characterized by conventional and synchrotron X-ray methods.** K. Mazur*, J. Sass*, F. Eichhorn**, A. Turos* **Institute of Electronic Materials Technology, ul. Wólczynska 133, Pl-01-919, Warsaw, Poland. **Institut fur Ionenstrahlphysik und Materialforschung des Forschunszentrum, Rossendorf, D-01-314 Dresden, Germany*
Keywords: surface crystallography.

The samples with different laterally structured surfaces were investigated by means of triple crystal X-ray diffractometry and synchrotron reflectivity measurements. The samples included the simple surface grating created by photolithography methods (the surface grating were of the same material as the substrate) and stepped surface created by the intentionally off orientation surface were performed. The X-ray triple crystal arrangement allows us to measure reciprocal space maps of the scattered intensity, separating the intensity contributions of the scattered truncation rods on the first kind of samples. The synchrotron non-specular reflectivity measurements at ESRF were essential for proving the existence of stepped surfaces and examination of their structure.