peak are correlated with either the thickness of the top layer or that of the Al component. 3. For the two kinds of samples with different sandwiched layers, we calculated the aluminium component. The results calculated using the kinematical and dynamical theories were found to be different. The result obtained using dynamical theory is closer to the actual growth parameters because kinematical theory neglects the interaction between the beams diffracted by each layer. In fact, the above interaction will directly influence the shape and the position of the diffraction peaks.

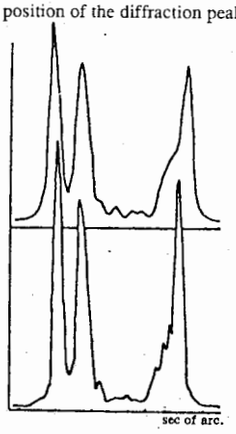

Fig. 1 Sample No. 1 (400) double srystal rocking curve. a) experimental curve; b) simulation curve.

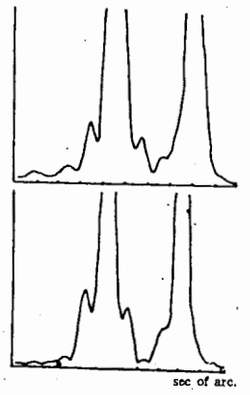

Fig. 2 sample No. 2 (400) double crystal rocking curve. a) experimental curve; b) Best-fit simulation of the experimental curve;

PS-13.03.14 MICROSTRUCTURAL CHARACTERISATION OF HEXAGONAL $(Ag,Cu)Zn_4$ ALLOYS IN THE DEFORMED AND AS-CAST STATE. By Hiranmay Pal, Swapan Kumar Pradhan and Madhusudan De, Department of Materials Science, Indian Association for the Cultivation of Science, Jadavpur, Calcutta-700 032, INDIA

Zn-based ternary alloys containing Ag and Cu as solutes having characteristic hexagonal close-packed (hcp) structure $(Ag,Cu)Zn_4$ have been studied for microstructural evolution in the deformed and as-cast state in order to correlate the microstructure with mechanical property of the materials. X-ray diffraction (XRD) line profile analysis, optical microscopy and scanning electron microscopy (SEM) have been used to study the microstructure and the mechanical property studied through the measurement of microhardness. X-ray studies of the deformed alloys reveal increased influence of solute Cu in the generation of deformation stacking fault of density α with increasing solute concentration. A reasonably good estimate of stacking fault energy parameter (γ/μ) for the alloys has also been made. Increased influence of solute Cu has been observed to control the grain sizes and microhardness. A close correlation could be established between the microstructural parameters and microhardness signifying the interdependence of mechanical property with microstructure of the alloys.

PS-13.03.15 THE SIMULATION OF BRAGG-CASE DOUBLE-CRYSTAL IMAGES OF DISLOCATIONS IN GAAS CRYSTALS by W.K.Wierzchowski*, Institute of Electronic Materials technology, ul. Wolczynska 133, 01-919 Warsaw, Poland

The numerical integration of Takagi-Taupin equations was applied to the simulation of back-reflection double-crystal topographic images of dislocations in GaAs crystals. The numerical program calculates the gradient of deformation field in the isotropic approximation talking into account the stress relaxation at the free surface. The thickness of the crystal slab is also assumed to be finite. In the present case where the absorption is very large the last assumption practically does not affect the simulated images and it allows to increase the size of the simulated image with a smaller computation time. It also enables placing the dislocation line further from the bound-aries of the intergration area. Taking into account the presence of epitaxial layer is also possible. In the present simulation, the finite divergence of the beam forming the image in the double-crystal method was taken into account. It was realized adding more than 60 images slightly differing in the assumed angle of incidence, weighted by appropriate rocking curves describing the angular distribution of radiation reflected by the monochromator.

The simulated images were compared to experimental images obtained with 511Ge, - 511GaAs double-crystal arrangement with Cu Ka1 radiation. Topographs were taken different equivalent reflections and the preliminary identification was on Lang transimission topographs.

A reasonable agreement between the simulated and experimental images was obtained, especially when a finite divergence of the beam was taken into account. In that case the interference fringes appearing close to the dislocation core in the plane-wave images were averaged.

The important feature of the simulated images was the presence of a characteristic black-white rosette. We proved a rough correspondence of it to the direct dilatation-orientation contrast coming from the displacement field. The contrast of the rosette was reversible with the change of the Burgers vector sign and with the change of the rocking curve slope. the extinction rules the reflection from equivalent crystallographic planes were significantly affected by surface stress relaxation phenomena.

Comparative simulation of dislocation images in crystals with lower absorption and smaller structure factors, such as silicon and diamond, exhibited a higher contribution of the different interference fringes at the expense of the rosette.

