M13.FF Topography

Chair: H. Klapper
Co-Chair: J.W. Hu

Attendance: 45

Among the six contributions to the microsymposium, four dealt with synchroton radiation topography and two with conventional X-ray topography. Haertwig et al. (Grenoble) presented the actual state of topographic imaging with the third-generation synchroton radiation at ESRF Grenoble, surveying the various methods and their instrumentations as well as their applications to problems of solid state physics and material science. Besides the high intensity of synchroton radiation even for photon energies up to 100 keV, its large spatial coherence is of particular significance, allowing imaging by phase contrast radiography and (3D) tomography in an instrumentally simple way.

The second contribution, presented by Epelboin & Soyer (Paris), reported on a new generation of programs ("the topographic suite") for the simulation of x-ray topographic images for various topographic settings (white-beam topography, plane-wave Laue and Bragg case topography) and optical characteristics of the radiation source. The application of the programs to selected problems experimentally treated at the ESRF was exemplified.

The benefits of the long beamline (80 m) of the Topography Station 7.6 at SRS Daresbury with its very small vertical divergence for topographic reticulography were demonstrated by Lang & Makepiece (Bristol). In this method (white-beam Laue diffraction) a fine absorbing mesh is placed behind the crystal and projected by the diffracted beam on a photographic plate with varying distance to the mesh. The distortions of the mesh shadow allow to determine the orientation differences between crystal segments of the probe. Several examples of application were shown, among them a reticulograph of a giant screw dislocation in SiC allowing to determine the handedness (left or right) of the screw.

Dudley & Huang (Stony Brook) reported on their white-beam synchroton topographic studies of hollow-core superscrew dislocations (micropipes) in 4H- and 6H-SiC single crystals.

A novel topographic procedure to determine the point-to-point lattice parameter variations near the crystal surface was introduced by Voloshin et al. (Moscow). The method is based on computer processing of plane-wave topographs obtained with conventional X-rays and allows *d*-value mapping on large specimen areas with spatial resolution of 3-10 (m and high sensitivity to lattice distortions (*d*/*d* up to 10^{-8}). The technique was applied to the study of KDP-type crystals grown from aqueous solution under different conditions.

The last contribution (Goswami & Lal, New Delhi) dealt with the conventional X-ray topography and high-resolution diffractometry study (Bragg geometry) of coiled GaAs membranes produced for force sensor applications. For the record of the high-resolution diffraction curves a five-crystal diffractometer was used. Half-widths of diffraction curves recorded at different regions of the coiled membrane and the tilt angles between them were communicated and discussed.

H. Klapper