the layer for $2\theta < 51.2^{\circ}$ (for Cu K_{α}), resulting in about 3500 data points and a total collection time of about 1 week. Counting time was chosen after some initial tests to achieve average counting errors in the intensity measurements of better than 10%. In all, data for 6 reciprocal lattice sections have been collected, and a detailed comparison with corresponding photographic data will be described.

An example contour plot, illustrating the quality of data obtained is shown in Figure 1.

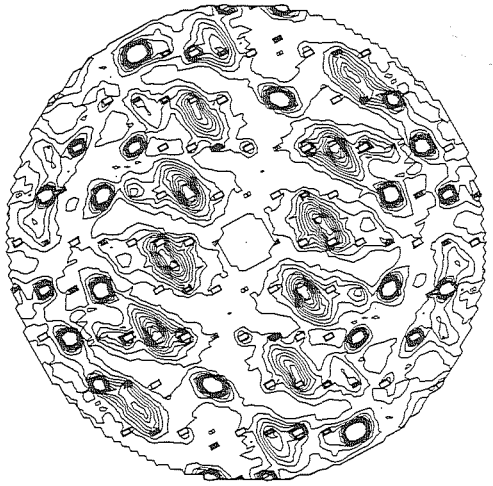

Figure 1. Contour plot of the h0l data. Contour levels are in equal increments of 250 counts. Bragg peaks appear as small quadrilaterals.

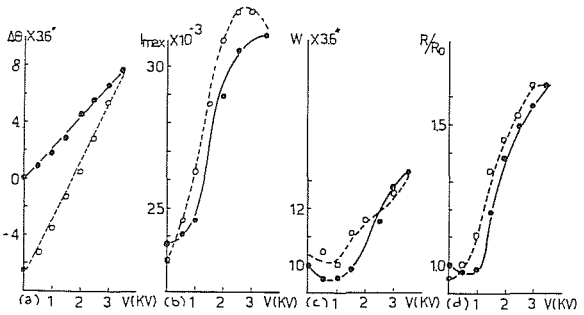

Fig. 1 Dependence of (a) peak shift, (b) maximum intensity, (c) half-width and (d) percentage integrated intensity on the applied DC voltage ((203) reflection, thickness of crystal t=0.31 mm, irradiated face at positive potential).
• increasing field; ○ decreasing field

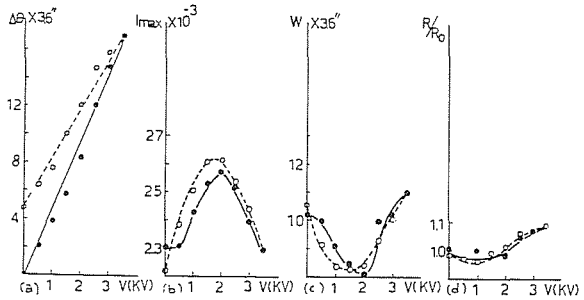

Fig. 2 Same as fig. 1 with reversed polarity.

11.5–4 EFFECTS OF ELECTROSTATIC FIELD ON THE X-RAY BRAGG DIFFRACTION OF α-QUARTZ.

By M. Calamiotou, Physics Dept., Athens Univ., E. Anastassakis, National Technical Univ., Athens, V. Psicharis and S.E. Filippakis, N.R.C. "Demokritos", Athens.

An increase of the X- and γ-ray integrated intensity of α-Quartz under the influence of an electrostatic field has been observed by Yasuda and Kato (Appl. Cryst.(1975) 8, 623) and Dousse and Kern (Acta Cryst. (1980) A36, 966) respectively, but the mechanism responsible for such an effect is not yet completely clear. We report here the results of an experimental study, in which a series of rocking curves of the (203) X-ray Bragg reflection of α-Quartz were measured in the presence of an electrostatic field up to ∿113 kV/cm. The integrated intensity at constant field was found to be time-dependent, suggesting the existence of relaxation effects. A field-dependent saturation value was reached after time intervals ranging from 20 to 45 min for field values of 16 to 113 kV/cm. Rocking curve characteristics such as peak position, peak intensity and half width were measured as a function of the field at saturation level (fig. 1a,b,c and d for percentage change of the integrated intensity). They all show hysteresis effects. It was also observed that the strength of the effect depends on the field polarity. When the negative electrode was attached to the irradiated face the effects were considerably reduced (fig. 2a,b,c,d). The measured peak shifts Δθ are typically one order of magnitude larger than those calculated on the basis of the reverse piezoelectric effect. It appears that crystal defects are largely responsible for the rather sizeable effects observed, thus preventing one from distinguishing field-dependent intrinsic contributions, such as those due to piezoelectricity and internal strains (Anastassakis, phys.stat.sol.(b) (1982) 110, 169).

11.5–5 X-RAY DIFFUSE SCATTERING IN LPE GaAlAs SOLID SOLUTIONS

C. Bocchi°, P. Franzosi° and C. Ghezzi°°

°Istituto MASPEC-CNR, Parma, Italy
°°Dipartimento di Fisica, Università di Parma, Italy

X-ray diffuse scattering (XRDS) experiments have been performed on thick (250 μm) $Ga_{1-x}Al_xAs$ ($x=0.35\pm0.05$) single crystal layers grown on (100) GaAs crystals by the liquid phase epitaxy (LPE). Using monochromatized Cu Kα radiation and small angular divergences (0.5°) of both the incident beam and the beam accepted by the counter, the I_D XRDS intensity has been accurately measured along the [100] direction in reciprocal space.
The intensity of the Compton scattering was independently measured at a few scattering angles by taking advantage of the energy resolution of a Si(Li) detector to partially separate the modified radiation. The Compton scattering data were interpolated by means of calculated incoherent scattering functions and then subtracted from the I_D. The I_{CW} intensity of the scattering due to composition waves is not dependent on the scattering vector $\vec{Q}$, while the I_{PH} intensity of the one-phonon scattering by LA and LO branches is proportional to Q^2. This made it possible to separate the two contribu-