11.7-10 BORRMANN-LEHMANN INTERFERENCE PATTERNS - EXPERIMENTS AND SIMULATIONS. By G. Kowalski, A.R.Lang, H.H. Wills Physics Laboratory, University of Bristol,UK.

In the usual diffraction geometrical conditions of transmission X-ray topography, a ribbon incident beam enters an extended entrance surface of the crystal, is Bragg-diffracted by planes making a large angle with the entrance surface, and the entire 'Borrmann fan' of rays contained between the $\underline{K}_o$ and $\underline{K}_g = \underline{K}_o + \underline{g}$ directions leaves the crystal by an exit surface which in general does not make a large angle with the entrance surface. This is 'Laue-Laue case' diffraction geometry. If the point of incidence of X-rays is near an edge of the specimen then a lateral surface of the specimen may cut the Borrmann fan(the 'Laue-Bragg case'). Partial internal reflection of X-ray energy flow occurs for the rays thus cut, according to dynamical diffraction theory, and then both the $\underline{K}_o$-beam images and the $\underline{K}_g$-beam images of the crystal will contain regions where the intensity leaving the crystal contains 3 components: I(LL) for rays travelling directly from entrance point to exit point, I(LBL) for rays reaching the exit surface indirectly via internal reflection at the lateral surface, and I(LL, LBL), their mutual interference, which gives rise to 'Borrmann-Lehmann' fringes (Lehmann & Borrmann, Z. Kristallogr., 1967, 125, 234-248). Developing the theory of Saka, Katagawa & Kato, 1972, Acta Cryst. A28, 102-113, 113-120, to provide explicit expressions for I(LL), I(LBL), simulations appropriate for many different cases in which part of the diffraction pattern contains all these three components have been made. Cases covered include both $\underline{K}_o$-beam and $\underline{K}_g$-beam images, X-rays polarised (i.e. SR) or unpolarised (i.e. conventional sources), variations in normal and anomalous absorption, and have been compared with experiments.

11.7-11 PRELIMINARY RESULTS OF A NOVEL TECHNIQUE FOR MEASURING ANOMALOUS SCATTERING IN SINGLE CRYSTALS - By. A. Ricardo D. Rodrigues. DFCM-IFSQC, Universidade de Sao Paulo e LNLS; and I. Mazzaro, Dept. de Física, Universidade Federal do Paraná, Brasil.

The diffraction peak in the Laue case is angularly shifted with respect to the peak in the Bragg case. This shift is proportional to the real part of the structure factor F_o and is of the order of seconds of arc.

Monocrystalline devices of silicon and germanium were manufactured allowing simultaneously Laue and Bragg case diffraction by the same Bragg planes. Diffraction profiles of both beams were measured for several wavelengths. The f' values were obtained from the distances between these peaks. Preliminary results of f' for silicon and germanium will be presented.

Supported in part by CAPES, CNPQ and FINEP.

11.7-12 DETERMINATION OF THE IMAGINARY PART OF ANOMALOUS SCATTERING FACTORS FOR SILICON* - By C. Cusatis, Dept. de Física da Universidade Federal do Paraná, Brasil.

Discrepancies between measured values of the photoelectric absorption coefficients in the literature can be partially explained as the consequence of ignoring several problems, especially scattering, in attenuation measurements.

Careful measurement of the attenuation coefficients of x-rays for several wavelengths allowed precise determination of the imaginary part of anomalous scattering factors for silicon.

*Supported in part by CNPQ and FINEP.

11.7-13 THERMAL PHONONS IN THE MODIFIED TWO-BEAM DESCRIPTION OF DIFFRACTION NEAR A THREE-BEAM POINT. By H.J. Juretschke, Department of Physics, Polytechnic University, Brooklyn, New York, 11201, USA.

The influence of thermal phonons on the dynamical diffraction $\underline{OH}$ near a third reciprocal lattice point $\underline{L}$, in an otherwise perfect crystal, is investigated theoretically.
It is shown that in the first order modified two-beam description (H.J. Juretschke (1984), Acta Cryst. A40, 379-389) all lowest order effects due to one-phonon transitions are governed by the usual Bessel functions, but only of arguments involving the reciprocal lattice vector $\underline{H}$.
With this proviso, the first order modified two-beam description of diffraction near $\underline{L}$ incorporates phonon coupling entirely in the standard manner of a strict two-beam case. Therefore typical phonon influences, such as the Debye-Waller factor or Thermal Diffuse Scattering can be discussed directly in the neighborhood of n-beam diffraction merely by using the modified parameters, i.e. structure factors, absorption coefficients, etc., in a traditional two-beam formulation.
Some additional implications of this result about the effect of other deviations from crystal perfection on the modified two-beam description are also presented.
This work has been partly supported by JSEP Contract no. F49620-85-C-0078.