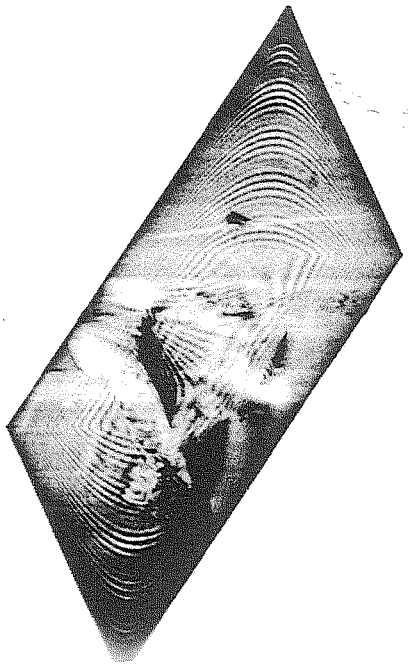
section topograph with Cu radiation. The fading phenomenon of I_3 fringes can be also seen, and the number of fading period is about 10.4 which is very close to theoratical calculation 10.35. In conclusion, the quantitative comparison of experiment with theory has been made and the agreement is found to be quite good.

(Fig.1)



A new facility DIFRAN is under construction being intended for a wide spectrum of experiments in the study and application of dynamical neutron diffraction at the IBR-2 pulsed reactor at JINR, Dubna (Alexandrov et al., VII. Conference of Czech. Physicists, Prague,1981).

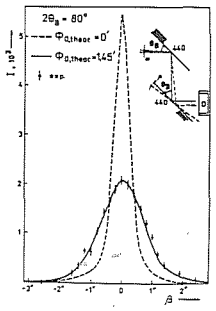


Fig. 1.

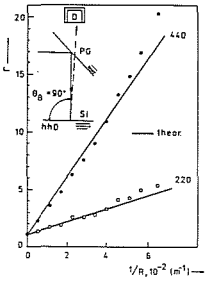


Fig. 2.

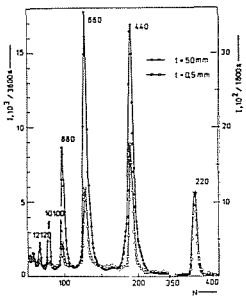


Fig. 3.

11.7–28 DYNAMICAL NEUTRON DIFFRACTION STUDIES ON Si SINGLE CRYSTALS BY THE TOF METHOD.
By Yu.A. Alexandrov (1), B. Chalupa (2), J. Kulda (2), T.A. Machekhina(1), R. Michalec (1), P. Mikula (2), L.N. Sedlakova(1), M. Vrana (1).
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The usage of high intensity pulsed neutron sources in connection with the time-of-flight (TOF) method opens interesting possibilities in the investigation of neutron-optical phenomena such as simultaneous measurement of several orders of reflection at fixed geometry of the experimental arrangement (Michalec and Mikula, IV. Intern. School on Neutron Physics, Dubna, 1982).
1. Double crystal rocking curves of perfect Si single crystals were studied. The departure of the observed rocking curve form from the dynamical one increasing with the order of reflection is explained in terms of vertical beam divergence and vertical misorientation angle ϕ_0. Fig.1 displays the results obtained for the 440 reflection.
2. The study of neutron back-scattering on a bent Si crystal proved that the integrated reflectivity is enhanced only by the variation of the interplanar distance d_{hkl}. At higher orders of reflection a considerable gain in intensity (fig.2) can be achieved in this way without major losses in energy resolution.
3. Thermal diffuse scattering of neutrons on a thick perfect Si crystal affects most distinctly the intensity of higher order reflections (fig.3).

11.7–29 CREATION OF NEW WAVEFIELDS IN DISTORTED CRYSTALS.
By J. Gronkowski, University of Experimental Physics, Varsaw, Poland and C. Malgrange, Laboratoire de Minéralogie-Cristallographie, Université Pierre et Marie Curie, Paris, France.

Although well evidenced phenomenologically for quite a long time, the creation of new wavefields (interbranch scattering) in highly distorted crystals was accounted for analytically only quite recently (F. Balibar, F. Chukhovskii, C. Malgrange, Acta Cryst. (1983) A39,387) for a constant strain gradient using an expansion of the Green function in the reciprocal space. The most important results of that theoretical approach were :

1. a demonstration that a new wavefield is created only if the tie-point of the original wavefield passes through the apex of the dispersion surface.
2. a simple analytical formula for the intensity of the phenomenon.

Allowing a conjecture included in that paper, the present authors performed a computer experiment with Takagi's equations and were able to show that these results were readily extendable to variable strain gradients (J. Gronkowski, C. Malgrange (1984) submitted to Acta Cryst.). The intensity of the newly created wavefield was shown to depend only on the value of the strain-gradient in the immediate vicinity of the region where the creation takes place. Even for highly distorted crystals, the basic equations of geometrical optics were shown to be valid if one considers separately the original wavefield and the new one. The applicability of such a combined approach (geometrical optics and analytical formula for the creation of new wavefields) to practical cases, e.g. the contrast of dislocations, will also be highlighted.