ESRF	**Experiment title:** Monochromatic beam diffraction topographic study of the fan-ferromagnetic coexistence in MnP	**Experiment number;** HS-420
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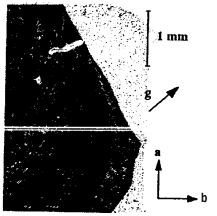
Report:

In a previous experiment, we observed in white beam an unusual interface between the ferromagnetic and fan phases in MnP. The aim of the experiment was to characterize more deeply this interface in monochromatic beam and to check for the existence of intermediate states.

The sample is a (001) platelet shaped crystal. The diffraction imaging experiments were performed using monochromatic produced by a double crystal Si (111) monochromator. We used a SOFRETEC CCD video camera, suited with a 15 mm thick 'Gadox' scintillator, for the real time observation of the phase coexistence. The sample was cooled in a helium closed circuit cryostat ('Displex'). A simple, remote controlled, film holder was set on the diffracted beam path to record a series of topographs without shutting the synchrotron beam. This appears necessary because the interruption of the experiment to open the hutch lead to a modification of the interface pattern. Kodak Industrex SR film was mainly used. The snapshot arrangement involved a distance of ≅ 50 cm between specimen and film. Exposures times were around 15 s.

This interface appears as a black strip or a series of black strips. The orientation of the strips is always parallel to the **a** axis, while the mean orientation of the series depends strongly on defects and temperature gradient. The figure was registered when only one strip was present in the sample. Then, the interface appears to be ≅ 500 mm wide. We could observe a continuous misorientation across the interface by rotating the sample and placing a different part of it on the peak of the rocking curve. However, it has well defined limits (fig.). The development under field is such that a black strip divides in several parts, giving rise to a series of strips. These parts, together with the joining regions, constitute a complex interface.

Therefore, the experiment clearly shows that the interface is an extended one. This is in contradiction to the standard view of magnetic interfaces, which are thin enough to be considered as planes for the topographic purposes. The variation of the Bragg angle appears as continuous in this experiment. Thus, the existence of intermediate states between the two phases is not proved. The vibrations of the displex reduced the true sensitivity of the technique. It appears clearly that this experiment should be repeated under improved experimental conditions (no vibrations, section topographs, which could be more suitable to check this point).



Figure