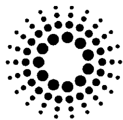

ESRF

Experiment title:

Microdefects in Silicon

Experiment number:

HC-542

Beamline: D5-BL10

Date of Experiment: from: 28-Mar-96 to: 03-Apr-96

Date of Report: 26-Aug-96

Shifts:

Local contact(s): J. Hartwig

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Report:

In the silicon wafers used in advanced memory circuits there are very few tiny microdefects, which have been observed using a special etching technique. The optical micrographs of the etched surfaces show images called flow patterns /1/.

Figure 1 shows a grazing-incidence topograph of an etched silicon wafer made at the ESRF topography beam line ID 19. A few images elongated in the direction of the diffraction vector result from the optical elements of the beam rather than from the sample. Figure 2 shows a grazing-incidence topograph of a similar sample made for comparison at the HASYLAB topography station F1. V-shaped rather large flow patterns and other small defect images which originate from the sample are clearly seen in this topograph made at the HASYLAB. In order to improve the imaging properties of the ESRF beam in this special application attention must be paid to its spectrum, windows and absorbers necessary for other topographic experiments.

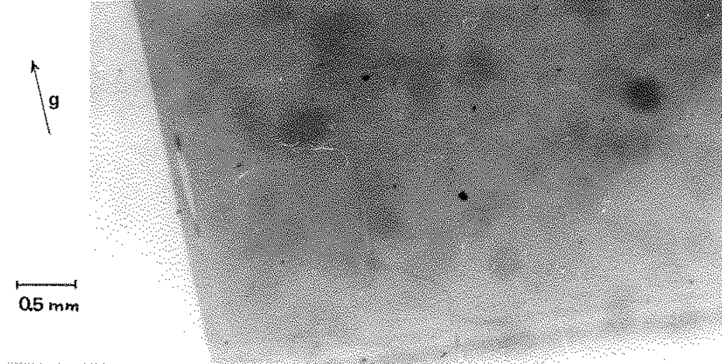

Fig. 1. Grazing-incidence topograph made at ESRF of a silicon wafer.

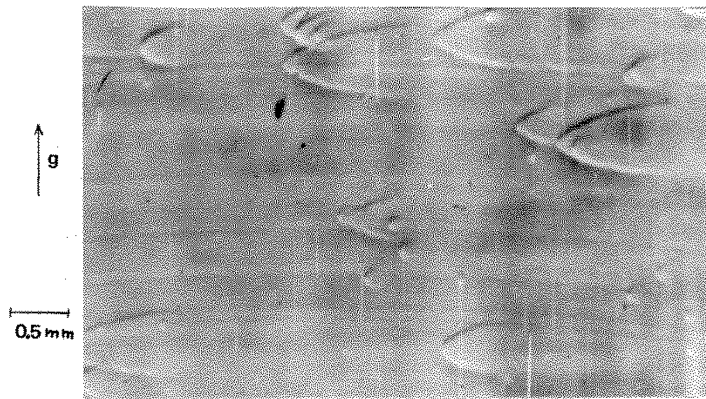

Fig. 2. Grazing-incidence topograph made at HASYLAB of a similar silicon wafer as that measured at ESRF.

/l/ R. Rantamaki, J. Molarius, M. Tilli and T. Tuomi,
Flow pattern defects in Czochralski-grown silicon crystals.
Physics Scripts (accepted for publication)