MUNI SCI Department of Condensed Matter Physics

Application Example

Profilometry for semiconductor technology

INTRODUCTION

This application list shows the possibilities of examining surface topology of semiconductor wafers after various technology steps, especially those of wide bandgap materials (e.g., SiC). Used is a commercial measuring instrument and specialized software for data evaluation.

The profilometry is useful for measurements of areas that are too large for the common AFM technique, and also for large heights of surface profiles. The operational ranges are well suited for rather rough surfaces occurring in the initial stages of wafering steps.

EQUIPMENT

Fig. 1 shows the Veeco Dektak profilometer, enabling to scan surface profiles along selected lines and rectangular areas. The heights (*z*) are collected in the horizontal plane (*x*,*y*), in preselected ranges. Measurement tips of different radii (typically 15 or 5 microns are available.

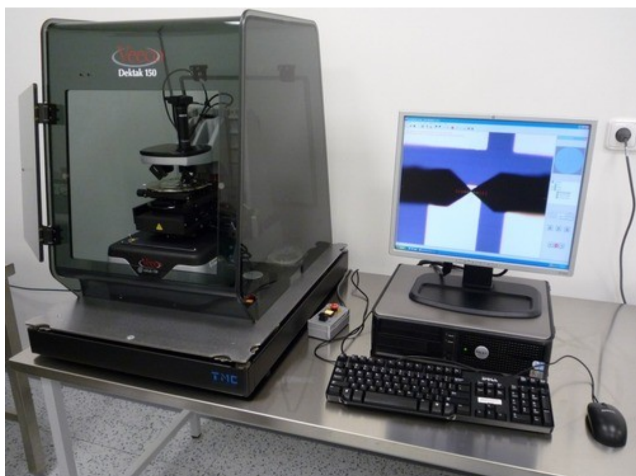

Fig. 1: Profilometer Veeco Dektak 150

EXAMPLES

Fig 2 shows height patterns observed on a surface split from a SiC crystal using a laser tool. The length of the profile (along *x*) is 12 mm, the distance between the lowest and highest value of *z* is 35.3 microns.

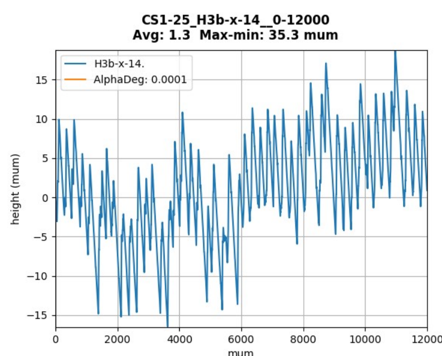

Fig. 2: Measured surface profile.

Shown in Fig 3 is an example of transformed profile, revealing flat portions inclined with respect to the (*x*,*y*) plane, and steeper transitions between them.

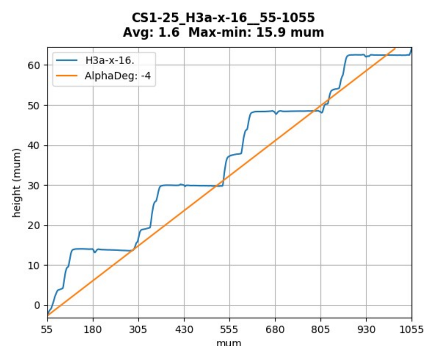

Fig. 3: A part of measured profile, shown with the baseline inclined by -4 degrees with respect to the (x,y) plane.

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MORE INFO

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