

CRYSTAL STRAIN QUANTIFICATION USING X-RAY IMAGING TECHNIQUE

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X-ray micro diffraction is the usual method to obtain strain information in crystals down to μm resolution. However, some practical issues need to be addressed with this method. The aligning of X-ray micro beam with the feature in a crystal is a major concern, and normally mesh scans are performed for this purpose. As a consequence the measurements will be time consuming. We present here alternative imaging based techniques providing quantitative strain information in crystals with comparable spatial resolution.

The application of CCD camera in X-ray imaging makes it feasible to reach spatial resolution of $1\ \mu\text{m}$. Under diffraction conditions, strain information can be obtained from these images. We have developed a method based on azimuthal rotation on X-ray topography to obtain strain along the rotation axis direction. Furthermore by using the lattice refinement method with X-ray bright field imaging, full strain tensor can be determined. The results of a SiC micro-pipe using X-ray imaging technique are comparable to those of micro diffraction measurements. The improvement in the speed and easiness is obvious. These methods will be presented and the comparison will be discussed.

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