

## **SR X-Ray Microdiffraction Systems at SPring-8: Present Status and Applications**

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In Hyogo beamline of SPring-8, we are developing research programs using an x-ray microbeam for applications to the wide range of science. Two types of the x-ray microbeam system have been developed; one is for a high spatial resolution and the other is for a high angular resolution. The former uses a Fresnel zone plate (FZP) for the x-ray focusing element, and the sub-micrometer beam is available [1]. By adopting a narrow slit in front of the FZP, a microbeam with a relatively small angular divergence can be also available [2]. The system is used, for example, for measurements of strain distribution in laser diodes with a  $\theta$ - $2\theta$  diffractometer and structural analysis of polymers with a diffractometer using imaging plate detectors. The smallest beam size ever achieved is 70 nm in FWHM at 10 keV. The latter system uses a total reflection focusing mirror with a bent-cylindrical shape and the microbeam possesses very a small angular divergence of several arcsec with the beam size of a few micrometers [3]. The system is used for the estimation of local crystallinity of various semiconductor crystals for electronic devices. The both systems are opened for many kinds of users.

[1] Kagoshima Y., et al., *Synchrotron Radiation Instrumentation, AIP Conference Proceedings*, 2004, **705**, 1263. [2] Kimura S., et al., *ibid.*, 1275. [3] Matsui J. et al., *Proceedings of the 4th International Conference on Advanced Science and Technology of Si Materials*, 2004, 237.

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