Exploiting brilliance at SPring-8 to improve the performance of semiconductor devices

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The hard X-ray undulator beamline BL13XU at SPring-8 offers a 100 nm focused X-ray beam for scanning X-ray diffraction microscopy. The nano-beam X-ray diffraction has been applied for analyzing local strain in single crystalline semiconductors such as 25-nm wide locally strained Ge [1], strained SiGe in Fin field-effect transistor (FinFET) structures [2], or heteroepitaxial AlN thick film grown on a trench-patterned template [3], to mention some examples. Besides further downscaling, local strain is one of the most important keys to improve performance of semiconductor devices. We have users not only from universities but also from industries who pay for their beamtime. The beamline is equipped with easy sample alignment tools such that non-expert users can align their samples precisely with a goniometer and let the focused X-rays hit the desired position on the sample surface. An overview of experiments, recent results and future aspects [4] will be discussed.

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[4] SPring-8-II Conceptual Design Report (http://rsc.riken.jp/pdf/SPring-8-II.pdf)