

CMOS Flatpanel Detectors for SAXS/WAXS Experiments

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CMOS flatpanel detectors have been commercially available for some years. We tested these in several different synchrotron radiation applications [1,2], including X-ray diffraction and scattering experiments. Even with a passive-pixel device, which has a higher noise level, an R-merge value of 6% was obtained in the processing of diffraction from a lysozyme crystal [2].

In small-angle scattering experiments, the detector may eventually replace the CCD-based detectors that are currently used in combination with synchrotron radiation. Since the CMOS detector is very compact in size, it is considered especially useful as a wide-angle detector in small-angle diffraction experiments. Not only it is possible to place the detector very close to the specimen, it is also feasible to align the detector so that one edge of the sensor lies very close to the beam. A special detector was manufactured by Rad-icon Imaging Corp to pass X-rays between two detector sensors, which were separated by about 3 mm. With this detector, it is possible to record a two-dimensional wide-angle diffraction pattern while another detector at the downstream end of the camera records a small-angle diffraction pattern. An active-pixel CMOS detector from Hamamatsu Photonics is also suitable for this purpose.

[1] Yagi N., Yamamoto M., Uesugi K., Inoue K., *AIP Conference Proceeding*, 2004, **705**, 344. [2] Yagi N., Yamamoto M., Uesugi K., Inoue K., *J. Synchrotron Rad.* 2004, **11**, 347.

Keywords: detector properties, synchrotron radiation, small-angle x-ray scattering