Contribution ID: **207** Type: **Oral presentation**

Low-energy X-ray detection with an in-vacuum PILATUS detector

Monday 4 July 2011 14:55 (20 minutes)

The feasibility of using PILATUS single-X-ray-photon counting detectors for long-wavelength macromolecular crystallography was investigated by carrying out a series of experiments at the Diamond Light Source. Results on detection threshold equalization at low-energy (with 2.3 to 3.7 keV X-rays) obtained with a PILATUS operated in helium environment were presented in reference [1]. To complement this study, a PILATUS detector was recently tested in-vacuum on the test beamline B16 of the Diamond Light Source. The PILATUS detector was exposed to monochromatic X-rays with an energy of 2.5 keV and 3 keV. Effects of detector cooling on noise performance, energy calibration and threshold trimming were investigated. When detecting 3 keV X-rays, the electronic noise of the analogue output of pixel preamplifiers forces the threshold to be set at a higher level than the recommended 50% energy level which minimizes charge-sharing effects. The influence of non-optimum threshold setting at low X-ray energy was studied by characterizing the detector response to a collimated beam of 3 keV X-rays scanned across several pixels.

[1] J. Marchal and A. Wagner, "Performance of PILATUS detector technology for long wavelength macromolecular crystallography", Nucl. Meth. Phys. Res A (2010), doi:10.1016/j.nima.2010.06.142

Primary author: Dr MARCHAL, Julien (Diamond Light Source)

Co-authors: Dr WAGNER, Armin (Diamond Light Source); Dr LUETHI, Benjamin (Dectris); Dr MYKHAYLYK, Vitaliy (Diamond Light Source)

Presenter: Dr MARCHAL, Julien (Diamond Light Source)

Session Classification: Applications I

Track Classification: Applications