Poster Presentation

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A photon-counting, large-area detector – PHOTON III

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The appearance of significantly stronger third generation synchrotron sources at large scale facilities and microfocus technology using in-house sources has led to the replacement of imaging plates by CCD, CMOS and HPAD detectors. Current state-of-the-art CPAD detectors, such as the PHOTON II, deliver impressive results and have allowed the collection of the first in-house GPCR structure only a few months ago

Modern synchrotron beamlines show a preference for largest possible detectors, which provide a number of advantages:
• Increased sample-detector distance results in reduced background X-ray scattering with improved signal-to-noise measured from weakly diffracting samples
• More reflections are collected per frame, reducing the radiation dose and overall measurement time
• Efficient collection of complete data at high resolution
• Better signal separation from reflections of very long unit cell axes

The Detective Collection Efficiency (DCE) is an established measure to describe the productivity of an X-ray detector[1]. The new PHOTON III is a detector for structural biology, which improves the DCE from two ends:

• The detector has a large active area of 2800 cm2.
• The detector is operated in a newly developed photon counting mode.

The PHOTON III offers large active-area detectors to the home laboratory at affordable costs. Like all our CPAD detectors the PHOTON III has zero read out time, does not suffer from charge sharing effects and satisfies the Shannon-Nyquist theorem. Even better, this goes along with a remarkable improvement in background suppression using the newly developed photon counting mode.

Apart from a discussion of technical details the presentation will focus on first data sets collected with the new detector.
[1] Stanton M (1993) Nuc. Instrum. and Meth. in Phys. Res. A 325(3),550-557.
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