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Dectris - Photon Counting X-Ray Detectors for Applications in Inspection and Non-Destructive Testing

Monday, 23 April 2018 17:10 (10 minutes)

Speaker: David Murer

Abstract: Hybrid Photon Counting (HPC) X-ray detectors have revolutionized the fields of single crystal- and powder diffraction over the past 10 years, and are now also increasingly used for imaging applications in medicine and industry. HPC detectors are comprised of a sensor part and a readout part, with the sensor bump bonded to the readout ASIC. An appropriate ASIC design gives the detector noise-free photon counting, a near ideal modulation transfer function significantly superior to indirect detection systems and virtually unlimited dynamic range. The detectors employ multiple energy-calibrated thresholds for each pixel; and a counter is incremented for each event exceeding the respective thresholds. This enables the resolution of the X-rays in multiple energy bins.

This work will give a broad overview of different applications of HPC detectors for applications in industrial testing and inspection. Experimental results of application- and characterization tests with DECTRIS HPC detectors will be presented, with an emphasis on the spectral capabilities. The talk will conclude with a discussion on the future of photon counting detectors for testing and inspection applications. Which hurdles need to be overcome for a wider adoption? How can their advantages be exploited? What gaps need closing?

Presenter: MURER, David

Session Classification: Presentations with demos