

Developments towards Soft and Tender X-rays at Dectris

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During the last two decades, Hybrid Photon-Counting (HPC) pixel detectors have significantly improved a large number of techniques performed at synchrotron light sources, and in many cases enabled new ones, due to their high frame-rate, dynamic range and stable operations. The impact of HPC detectors has however been limited mainly to the Tender and Hard X-ray range, while the Soft X-ray regime is not fully accessible yet. Dectris has been pushing the lower energy limit, mainly with the detectors of the PILATUS series, reaching thresholds as low as 1.6 keV [1].

This contribution will present the current efforts that are being made within Dectris in the pursuit of enabling the detection of lower energies, with photon-counting detectors. This goal is being addressed in different ways, including optimizing the current detector designs, exploring new sensor types with internal multiplication (LGADs), and developing a new high-energy resolution dedicated ASIC. Characterization results for various prototype systems obtained in-house, as well as during beamtime at synchrotrons, will be shown.

References:

[1] Wernecke, Jan, et al. "Characterization of an in-vacuum PILATUS 1M detector." *Synchrotron Radiation* 21.3 (2014): 529-536.

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