

Laboratory and in-field X-ray applications with hybrid photon counting detectors

In only a decade, Hybrid Photon Counting (HPC) detectors have become the first choice for a variety of synchrotron X-ray applications. Nowadays, the broadened portfolio with a number of lab-specific product series is fulfilling all requirements of laboratory applications and PILATUS, EIGER and MYTHEN detectors are readily claiming their dominance in laboratory X-ray diffractometers and SAXS instrumentation.

High technical specs of HPC-detectors, combined with affordability, stability and low maintenance have made them attractive also for more exotic laboratory applications. For these reasons, it is not surprising that HPC detectors can be found in diffractometers dedicated to in-field analysis, high-resolution Pair Distribution Function studies or residual stress measurements.

This presentation covers several relatively new developments that rely on a combination of HPC-detector and a laboratory source. In particular, we demonstrate the accuracy, sensitivity and speed of three portable X-ray diffractometers optimized for: (a) analysis of minerals and metals (b) on-site study of cultural heritage (c) residual stress measurements. As last, we present a recently developed instrument, designed for collecting high-resolution Pair Distribution Function data.