

LABNOTE

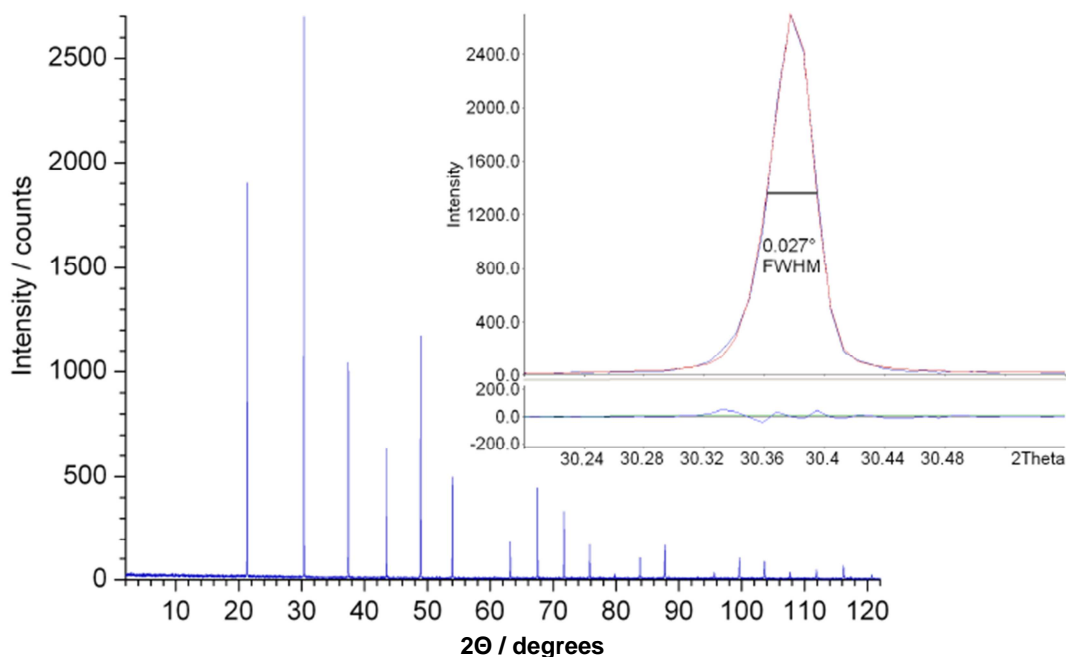
THE NEW MYTHEN 1K STRIP DETECTOR FROM DECTRIS:
PERFORMING ULTRA HIGH RESOLUTION MEASUREMENTS ON
STOE'S STADI P AND STADI MP DIFFRACTOMETER 1 | 2

CHARACTERISTICS AND SETUP

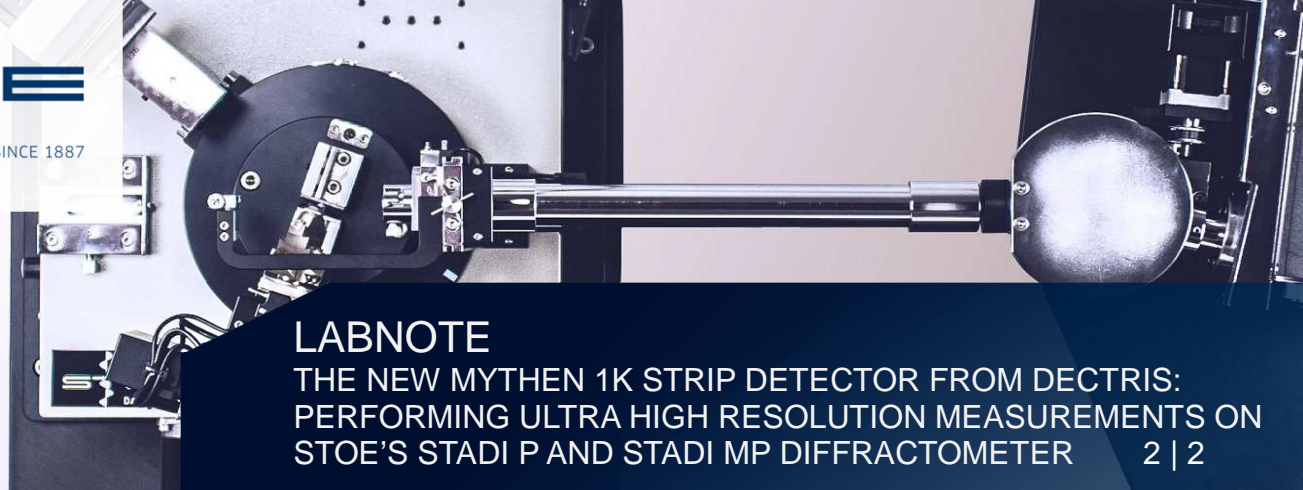
The new **MYTHEN 1K detector** from DECTRIS (Baden, Switzerland) has been implemented on STOE's Stadi P and MP diffractometer and used as the ultimate PSD for fast measurements with ultra high resolution.

With a *NIST SRM660a LaB6* standard powder sample, an angular resolution below $0.03^\circ 2\theta$ FWHM can be achieved.

In the optimized setup, the detector simultaneously collects an angular range of $12.5^\circ 2\theta$ with native data point intervals of $0.01^\circ 2\theta$. In the expert mode, patterns with data point intervals up to $0.005^\circ 2\theta$ can be measured. Due to its wide detector window, the MYTHEN 1K detector collects very fast, additionally keeping the outstanding angular resolution constant over the complete opening.

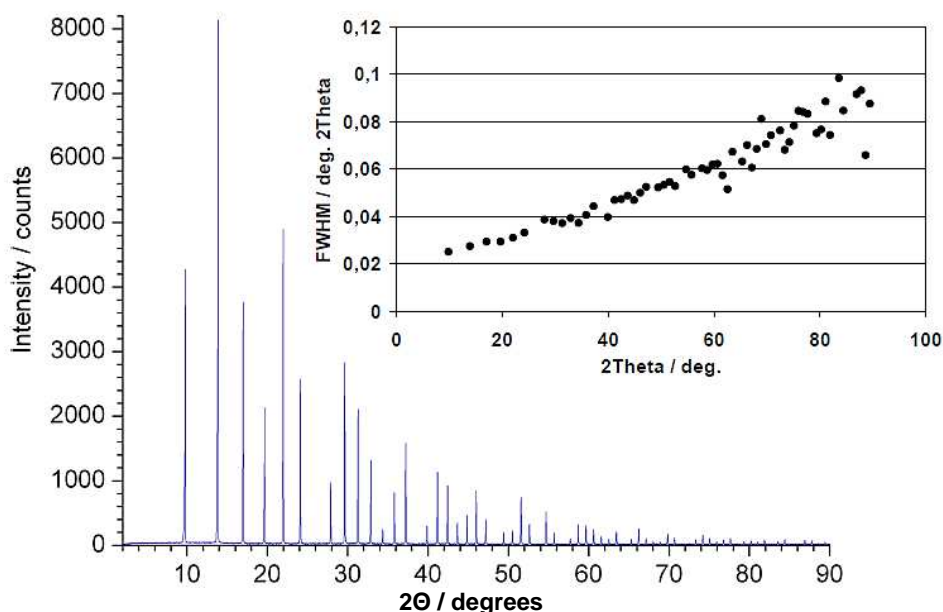


Powder pattern of *NIST SRM660a LaB6*, measured on a STOE Stadi MP with Cu radiation in transmission mode (data point interval 0.009°). Note the good fit and the high resolution shown by the (110) reflection (see inlay above).

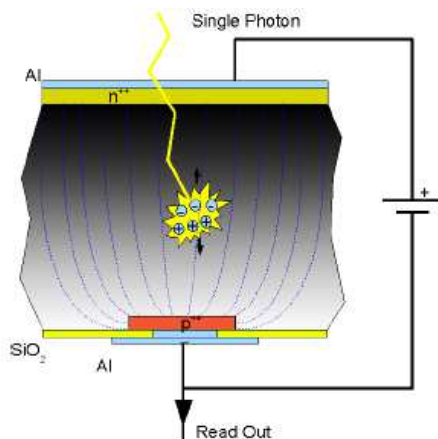


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Powder pattern of NIST SRM660a LaB6, measured in a 0.1 capillary on a STOE Stadi P with Mo radiation (data point interval 0.01°). Note the low background and the extraordinary FWHMs (for the latter see inlay above, shown as function of 2θ).



The MYTHEN 1K detects the X-rays just-in-time via an one-dimensional reverse-biased silicon strip array operating in single-photon counting mode. The new strip technology entails an exceedingly low background without dark current or readout noise, thus leading to an excellent signal to background ratio. Additionally, the adjustable threshold allows an effective suppression of fluorescence radiation.

As a result of its small dimensions, the MYTHEN 1K detector system is easy to handle. Moreover, it is completely free of maintenance, no cooling is needed.

Based on the full integration of the MYTHEN 1K detector in the STOE WinX^{POW} software, powder diagrams are collected either stationary or in configurable step widths as usual, the single range steps being automatically combined by the data collection program.

Technical specifications:

Sensor thickness	320 Mm
Strip size	50 Mm
Format	1280 strips
Active area	8 X 64 mm ²
Dynamic range	24 bits
Counting rate	> 2 x 10 ⁵ per strip
Energy rate	5 – 30 keV
Readout time	0.3 ms
Dimensions	72 x 100 x 25 mm ³



Working with all common wavelengths, the MYTHEN 1K can be installed on all currently available powder diffractometers from STOE, thus showing its versatile applicability.