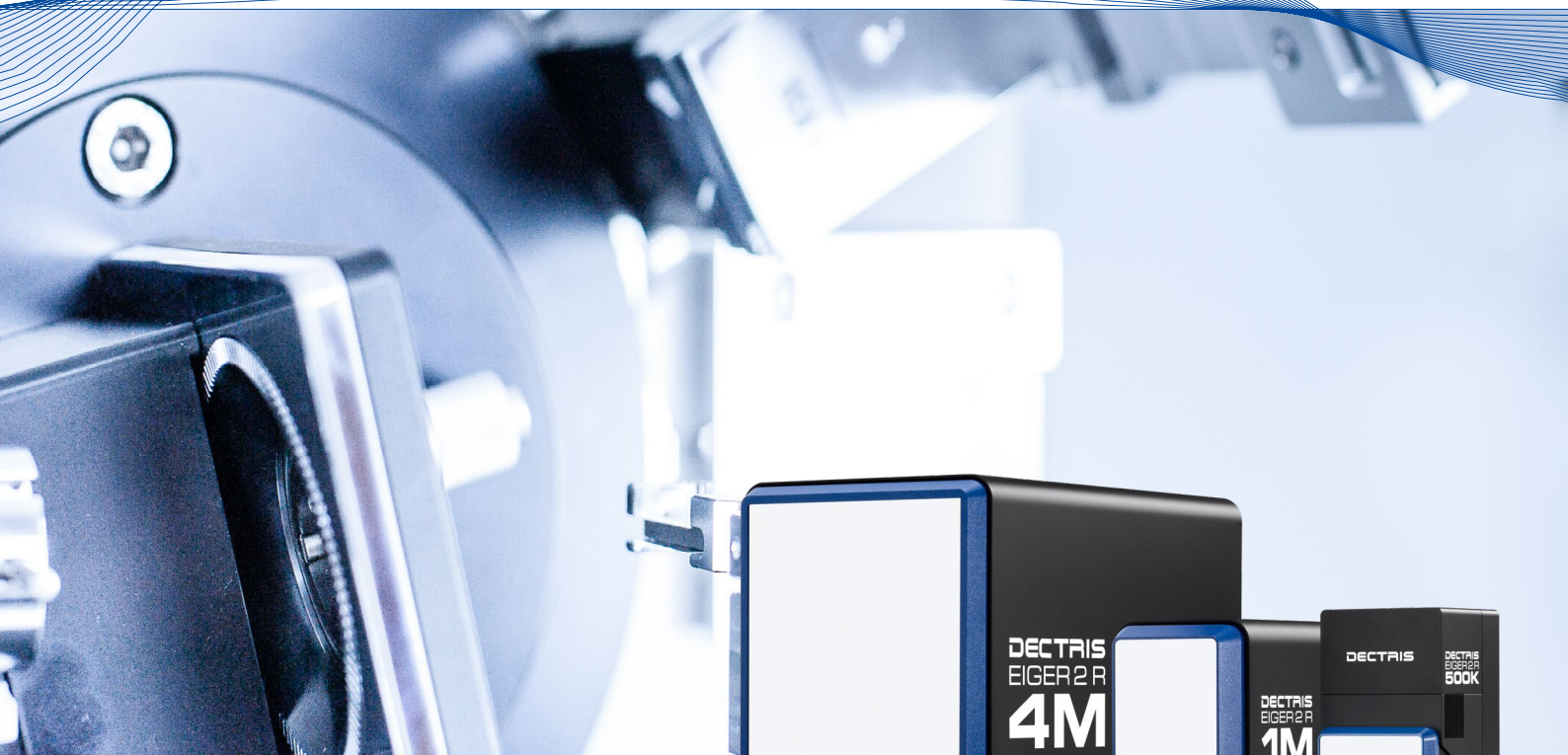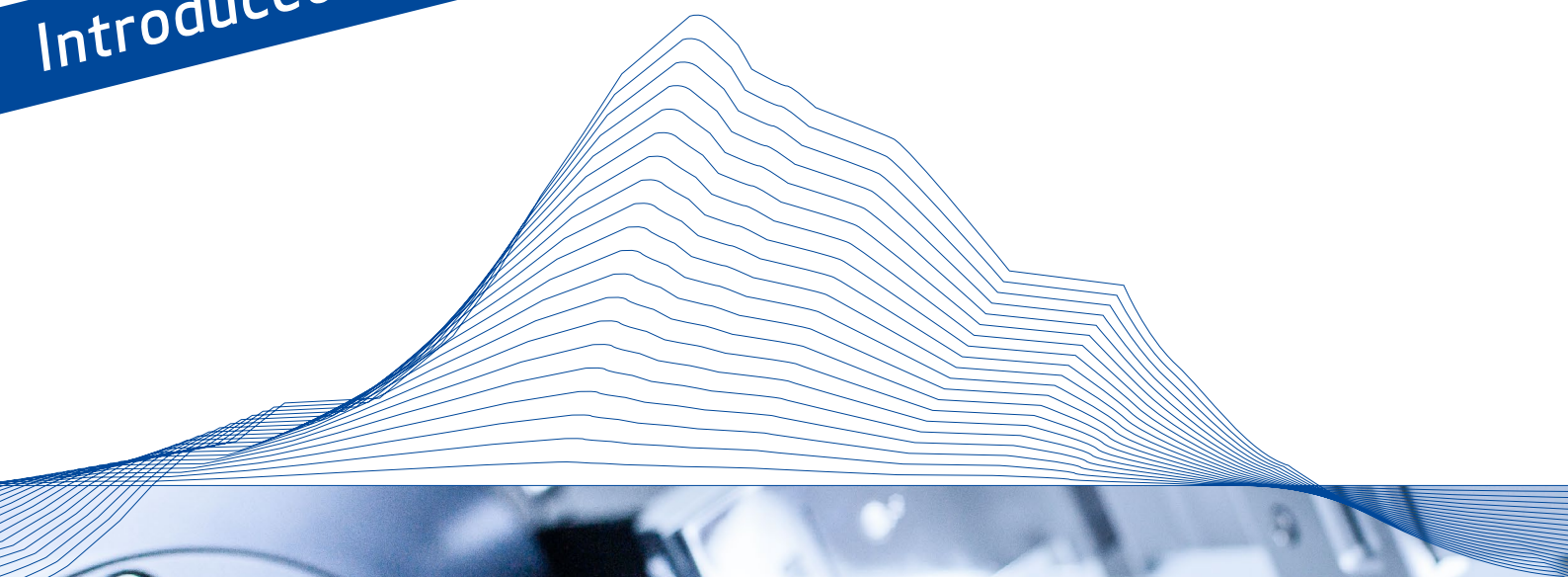Introduced at SAS 2018

DECTRIS
detecting the future

EIGER2 R

Dual energy discrimination for lowest background

## The laboratory detector series

EIGER2 R combines all state-of-the art features of HPC technology in our most advanced detector series for laboratory applications. Dual energy discrimination allows for extensive background suppression and improves signal-to-noise in particular for weak signals and long exposure times. Superior count rate performance enables accurate measurements of highest intensities. Take full advantage of the detector series' vast dynamic range even during long exposures using simultaneous read/write with zero dead time. Thanks to the optional vacuum compatibility, absorption and scatter from air and windows can be minimized. Small pixels in combination with direct detection achieve high spatial and angular resolution and give you the benefit of fine sampling and wide coverage of reciprocal space. Choose from three different models to match your needs.

Key Advantages

– Suppresion of low and high energy background thanks to dual energy discrimination
– Highest dynamic range thanks to zero detector background and simultaneous read/write
– Small pixels and narrow point-spread function for high resolution
– Optional vacuum compatibility
– Service- and maintenance-free detector system

Applications

– SAXS/WAXS
– Macromolecular crystallography
– Chemical crystallography
– X-ray powder diffraction
– X-ray reflectometry
– Diffuse scattering
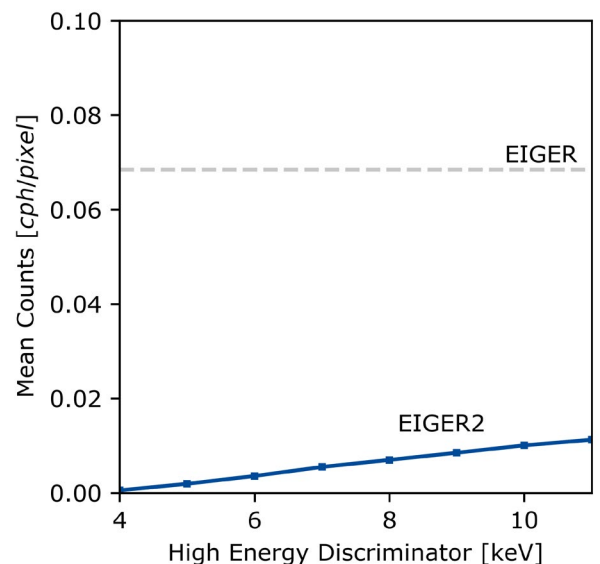
Dark count suppression thanks to dual energy discrimination. Grey: Dark counts for EIGER with single energy discriminator set to 4 keV. Blue: Dark counts for EIGER2 R 500K with low energy discriminator at 4 keV as function of high energy discriminator setting. Dual energy discrimination achieves fivefold reduction of the environmental background.
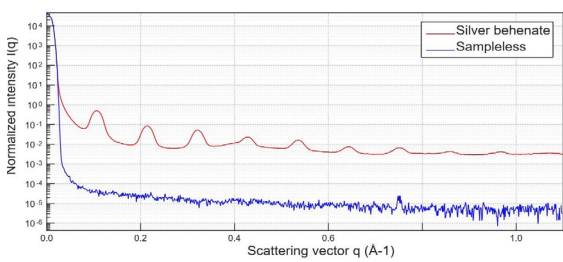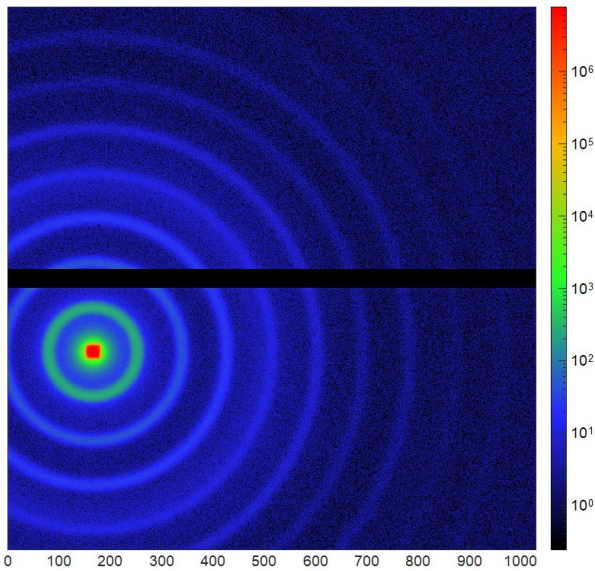
WAXS signal of Silver behenate (AgBH). Top: Raw data acquired with an EIGER2 R 1M in a Xeuss3.0 SAXS/ WAXS instrument from Xenocs. AgBH is a well know standard in SAXS due to its strong scattering peaks. I(q) is measured over seven orders of magnitude. The x axis indicates the detector pixels, the scale on the right shows how intensity (in photons) is mapped to color. Bottom: The dual plot of AgBH signal and negative control shows that the dynamic range of the EIGER2 R detectors easily covers the more than ten orders of magnitude needed for weakly scattering samples.
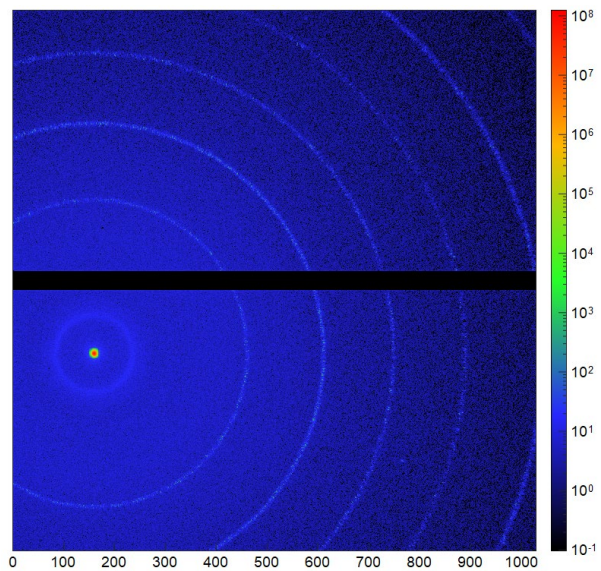
WAXS signal of lanthanum hexaboride (LaB6). Thanks to direct detection and small pixel size, the sharp scattering rings are captured with high angular resolution. The large sensitive area of the EIGER2 R 1M enables the acquisition of multiple scattering rings in a single image. The x axis indicates the detector pixels, the scale on the right shows how intensity (in photons) is mapped to color.

Technical specifications

EIGER2 R	500K	1M	4M
Number of detector modules	1	1 × 2	2 × 4
Sensitive area, width × height [mm²]	77.2 × 38.6	77.2 × 79.9	155.2 × 162.5
Pixel size [µm²]		75 × 75	
Point-spread function		1 pixel (FWHM)	
Energy discriminating thresholds		2	
Threshold range [keV]	4 - 11	3.5 - 30	3.5 - 30
Maximum count rate [cps/mm²]		3.6×10^8	
Counter depth [bit/threshold]		2 × 16	
Acquisition mode		simultaneous read/write with zero dead time	
Image bit depth [bit]		32	
Optional vacuum compatibility		yes	
Cooling	Air-cooled	Water-cooled	Water-cooled
Dimensions (WHD) [mm³]	100 × 140 × 93	114 × 133 × 240	235 × 237 × 372
Weight [kg]	1.8	3.9	15

All specifications are subject to change without notice.