

Zyla - The Physicist's Choice

Technical Article

Zyla sCMOS has become a well established detector amongst physicists, biophysicists and astronomers, the advanced combination of speed, sensitivity and dynamic range enabling new ground to be broken.

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sCMOS image courtesy of Jin Ma, Xinglong Observatory National Astronomical Observatory of Chinese Academy of Sciences

Performance and adaptability...

- **Dual Amplifier** – novel pixel architecture means you don't need to pre-select gain. Access lowest read noise and full well depth simultaneously.
- **1000 fps** – Access extremely fast frame rates through user definable Region of Interest control, suited to many applications within the physical sciences.
- **GPU Express** – for real time processing.
- **Global Shutter** – Zyla 5.5 offers this important mode that completely avoids spatial distortion, and ensures temporal correlation across all regions of the sensor. Achieve sub-microsecond inter-frame gaps in PIV applications.
- **Low darkcurrent** – Low read noise is complimented by extremely competitive darkcurrent, also ensuring minimized hot pixel blemishes.
- **Cooling options** – Standard camera air cools to 0°C up to +30°C ambient. Water cooled option available on request.
- **Blemish correction maps and advanced control** – Upon request, Andor provide bespoke capability to turn off/on blemish correction, for those who prefer to perform this themselves. Blemish maps can be provided.
- **Compact and Light** – the extremely small volume footprint of Zyla renders it adaptable to intricate optical set-ups.

Example areas of application...

- **Lucky / Speckle Imaging** – Zyla's fast frame rate and large field of view are ideal for this resolution enhancing technique.
- **Adaptive Optics** – Accessing > 1000 fps using ROIs renders the Zyla and ideal Wavefront detector. Use with data splitter to enable direct data access.
- **Solar Astronomy** – Fast frame rates, wide dynamic range and great linearity present a very formidable solution to the specific detector needs of next generation large solar telescopes.
- **Fluorescence Correlation Spectroscopy** – superb temporal resolution from small ROIs are excellent for accurately measuring diffusion coefficients.
- **Bose Einstein Condensation** – the QE profile of Zyla is very good in the red/NIR region, ideal for BEC of Rb.
- **X-ray / Neutron Tomography** – The Zyla can be readily lens coupled to scintillators and phosphors, presenting a high resolution, sensitive and fast solution for tomography.*

Spectroscopy Mode (Zyla-S version only)

- **On-head asymmetric binning & multi-track** - Intelligent data processing from the sensor into Spectroscopyfriendly spectra or multi-channel data format, ahead of transfer through the 10-tap or USB interface; greatly reduces data post-processing and data set size at the user side.
- **User-definable bit depth** - Up to 32-bit data packaging option to overcome the limitation of the standard 16-bits data transfer through 10-tap or USB3 in extensive binning scenarios.
- **Hyperspectral Imaging & multitrack spectroscopy** - On-head FPGA functions can discriminate up to 256 individual channels (e.g. multi-leg fibre optic) with no acquisition rate sacrifice compared to CCDs. Takes great advantage of Andor's spectrograph portfolio imaging portfolio e.g. Andor Holospec.
- **Transient spectroscopy** - Samples highly dynamic chemical reactions or phenomena with spectral rates up to 27,000 sps with 10-tap Zyla 5.5 and 26,000 sps with 10-tap Zyla 4.2.