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Princeton Instruments Enhances ProEM EMCCD Camera Performance by Incorporating Breakthrough eXcelon Back-Illuminated Sensor Technology

Trenton, NJ — Princeton Instruments is pleased to announce the addition of proprietary eXcelon back-illuminated sensors to its popular ProEM deep-cooled EMCCD camera platform. New eXcelon-enabled ProEM cameras provide significant improvements in sensitivity and fringe suppression. Available in 512x512 and 1024x1024 frame-transfer pixel array formats, these next-generation ProEM cameras offer superior performance for a variety of applications, including single-molecule fluorescence imaging, time-resolved astronomy, and plasma diagnostics.

Developed jointly with e2v, eXcelon EMCCD sensors deliver excellent photon-detection capabilities across a wide spectrum (200–1100nm) and are particularly beneficial for applications requiring enhanced sensitivity in the blue and near-infrared (NIR) regions. Additionally, these eXcelon back-illuminated sensors greatly reduce etaloning, the problematic appearance of fringes due to constructive and destructive interference in the device's back-thinned silicon when imaging in the NIR region (750–1100nm).

"Until now, researchers looking for fast frame rates and high sensitivity in the NIR region had to choose between standard front-illuminated and back-illuminated EMCCD architectures, each of which is hindered by severe drawbacks," says Ravi Guntupalli, Product Manager at Princeton Instruments. "Front-illuminated sensors, for instance, have 2x to 3x lower sensitivity than their back-illuminated counterparts, whereas back-illuminated EMCCDs suffer from etaloning in the NIR region. By contrast, eXcelon EMCCD sensors not only counter etaloning, they also boast ~90% peak quantum efficiency. For the first time, researchers can select an EMCCD camera that gives them single-photon detection capabilities over a broad spectrum."

Since being introduced in January 2009, the ProEM series from Princeton Instruments has quickly become the reference standard for scientific EMCCD cameras. ProEM cameras offer novel high-performance features such as OptiCAL (for precise EM gain calibration), along with the lowest read noise on the market, detector cooling to below -90°C, an all-metal sealed design backed by a permanent-vacuum guarantee, and a Gigabit Ethernet (GigE) interface that ensures fast data throughput. Furthermore, the availability of 100kHz "non-EM" mode operation means that the cameras can also be used for steady-state applications with read noise as low as 2 e^- rms. New eXcelon sensor technology further extends the impressive utility of ProEM cameras for time-resolved, low-light applications.

About Princeton Instruments

Princeton Instruments designs and manufactures high-performance CCD, ICCD, and EMCCD cameras; spectrographs; and optics-based solutions for the scientific research, industrial imaging, and OEM communities. We take pride in partnering with our customers to solve their most challenging problems in unique, innovative ways. Princeton Instruments is a registered ISO 9001:2008 company. For more information on Princeton Instruments products, please visit www.princetoninstruments.com.

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