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EIGER a new single photon counting detector for X Ray applications: performance of the chip.

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EIGER is the next generation of single photon counting detector for synchrotron radiation designed by the PSI-SLS detector group. It features a pixel size of $75 \times 75 \mu\text{m}^2$ and frame rates up to 22kHz. An array of 256×256 pixels fits on a $2 \text{cm} \times 2 \text{cm}$ chip. The chip provides 4, 8 and 12 bit counting modes and practically an infinite dynamic range (32 bits) due to the continuous read/write and the summation of frames on the fly in firmware. Along with the first X Ray absorption images, the characterization and performance of the chip will be presented. The most important parameters i.e. energy calibration, noise, minimum energy threshold and rate capability were measured on a single chip system with an X Ray tube and at the SLS-PSI synchrotron. Trimming and irradiation studies will be discussed. Tests so far have shown that the EIGER system meets its specifications. A report on the status and plan for a full module (2x4 chips) and 4M pixel EIGER detector will also be given.

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