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Photon detection with CMOS sensors for fast imaging

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CMOS sensors are developed for high energy physics. They offer a unique optimization with respect to granularity, thickness, readout speed, radiation tolerance and power consumption. We focus here on photon imaging.

After a presentation of the general achievements of the MIMOSA sensors, we discuss the sensor ability to detect X rays of a few keV. We then turn to the back-thinned version of CMOS sensors associated with a photocathode. This new hybrid photo-detector, called EBCMOS, provides single visible photon counting and positioning with high resolution at large frame rates. Results obtained with the first EBCMOS produced in 2007 are shown and its first operations in fluorescence microscopy for biology reported. We conclude on the current developments to reach 1000 frames per second and beyond.

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