

## EDET DH80k - Characterization of a DePFET based sensors for TEM Direct Electron Imaging

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The EDET DH80k is a 1 MPixel camera system, optimized for the direct detection of 300 keV electrons from a TEM equipped with a pulsed, high intensity electron source. It was designed to record stroboscopic movies of dynamic processes with unprecedented temporal and spatial resolution. The camera consists of four identical modules with the complete set of frontend and peripheral electronics required for standalone operation. The sensitive part of each module is a sensor array with 512 x 512 pixels of 60  $\mu\text{m}$  x 60  $\mu\text{m}$  each, which yields an overall sensitive area of 3 cm x 3 cm. The same area is back thinned to either 50  $\mu\text{m}$  or 30  $\mu\text{m}$  to minimize the multiple scattering of electrons. In combination with a beam-stop optimized for low backscattering of electrons, this results in an optimized line spread function. The sensor array is based on the DePFET pixel design, which is a highly modifiable combined sensor-amplifier structure, with an inherently high peak to background ratio and high speed readout capability. For the EDET DH80k camera a DePFET design with

- a nonlinear in-pixel signal compression,
- large ( $\sim 10^6$  electrons) dynamic range,
- and a specialized readout scheme that allows for an 80 kHz frame rate

was developed.

Detailed results from the first measurements on pixel level with low noise measurement setup (SPIX) will be presented.

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