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The Quadropix DEPFET concept

Currently, several development activities for the European Solar Telescope, a next generation, large aperture solar telescope are ongoing. Among its observational capabilities, EST will provide high time resolution, high precision polarimetric imaging of the solar atmosphere that can be utilized to determine the magnetic fields within and their temporal evolution. For these measurements, a new kind of polarimetric camera system providing modulation frequencies of the order of several kHz, frame rates of 400 Hz and an intrinsic storage capability for up to 4 modulation images is currently in development.

At the MPG HLL we developed a sensor concept for such a system - the Quadropix DEPFET. This novel concept provides in-situ storage of the information for four images. According to simulations, switching between different storage nodes is done within 100 ns and orders of magnitudes faster than the foreseen modulation frequencies. Furthermore, the modulation is decoupled from the frame rate that is proposed to be 400 Hz for a 1 MPixel device. Within the scope of GREY and EST these devices can be used for high precision polarimetry. In this presentation we present the concept itself, a simulation study of Quadropix variants and the current development status.

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