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The PERCIVAL 2-Megapixel soft X-ray CMOS Imager –Status and Prospects

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The PERCIVAL soft X-ray 2-Megapixel CMOS imager has been developed by a collaboration of light sources and RAL to meet experimental needs at todays Synchrotron and FEL soft X-ray sources. Systems have been in operation at two collaboration facilities, and are currently under commissioning at two more.

First user experiments at FLASH and Petra III's soft X-ray beamline P04 have demonstrated the system's potential, with new parameter space and experiments becoming accessible primarily thanks to Percival's high dynamic range (single-photon discrimination at 250eV to full well of 3.6Me-) and comparatively high frame rate (83 Hz achieved with current DAQ firmware, 300Hz aim) over a large area.

The first-generation sensor has some shortcomings, primarily due to crosstalk –these are currently being addressed in a redesign of the Silicon layout. In parallel, we are upgrading DAQ hard- and firmware and head mechanics, and addressing sensor nonlinearities in improved calibration.

We will report on the status of the project, give an overview of user experiments performed, and describe the sensor and system upgrades in progress.

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