MATTER AND TECHNOLOGIES

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High frame rate X-ray imager for photon science

Over the next 5-10 years, new photon sources such as diffraction-limited synchrotrons and CW-mode superconducting FELs will require X-ray pixel detectors capable of operating with continuous frame rates of over 100 kHz. This frame rate requirement must be combined with a high dynamic range and sensitivity, a reasonably small pixel size (<100um) and a detector size of many megapixels. We present a conceptual design of such a high frame rate detector, showing that these specifications can be met on this timescale by adopting new technologies such as 65nm CMOS ASIC design and the latest optical and FPGA components. Additionally, we show this project's role in the European roadmap for detectors at photon sources.

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