MATTER AND TECHNOLOGIES

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# Continuous Readout Digitising Imager Array Detectorfor Synchrotrons and FELs

A modern X-ray sources are being upgraded - along with synchrotron rings which are being upgraded to become diffraction limited a high-brilliance FELs are also concerning changing the pulsed operation mode up to Continuous Wave (CW) operation. A common need emerges for detectors able to operate continuously at high rates, while having a high dynamic range and single photon sensitivity. The CoRDIA (COntinuous Readout Digitising Imager Array) detector is being developed to fulfil such needs, in a collaboration between DESY and Bonn University.
The detector is being built on our experience of charge-integrating detectors for FEL applications, extending operation to CW mode up to a maximum frame rate of about 150 kHz. On-chip Analog-to-Digital Conversion and a Continuous Writing-Reading scheme are foreseen to allow operation also during detector readout. The ASIC is designed to be compatible with several sensor types in order to cover different energy ranges. Its goal is to achieve single photon resolution and at the same time extend the dynamic range to several thousands of photons by use of adaptive gain selection.
An ASIC prototype containing the whole read-out pipeline circuitry in 65nm technology is presented. The Caribou test environment is used for the prototype testing.

## Speed Talks

Normal

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