

New sensors for particle detection with in-situ charge storage

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Image Sensors with In-situ Storage (ISIS) are being developed for use in future linear collider and fast imaging applications. The ISIS device consists of pixels each with a short charge storage register. Charge is collected by a photogate and stored in one of many in-pixel storage registers, for readout during quiet periods in the beam duty cycle. For an ILC application it is expected that 20 storage cells and a relatively low readout rate of 1MHz will be sufficient. I will present the results in testbeam of a CCD-based proof of principle device, with 16 x 16 ISIS cells with a buried channel CCD storage register in each.

A new device is currently being fabricated in a CMOS 0.18 micron process, and is due out at the time of the workshop. It incorporates interesting features of CCD-like buried channel and deep p+ shielding implants, which allow efficient charge collection and integration of readout structures on the same wafer.

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