Contribution ID: **250** Type: **Oral**

CSPAD-140k - a versatile detector for LCLS experiments

Friday, 25 May 2012 17:25 (20 minutes)

With the successful operation of three 2.3 megapixel, 120Hz readout rate, hybrid pixel array detectors at the Linac Coherent Light Source (LCLS), the SLAC detector group is now exploring further applications based on the same detector platform. These megapixel cameras are based on the Cornell-SLAC hybrid Pixel Array Detector (CSPAD).
One of the first spin-off detectors based on the proven CSPAD platform is the CSPAD-140k: a 140 kilopixel detector, with an active area of ca. 4x4cm^2 and four ASICs, in a small, inexpensive and easy-to-deploy package. The CSPAD platform is developed around the CSPAD ASIC with 36 kilopixel of 110x110 μm^2 size. Important characteristics of the CSPAD such as room temperature operation, 14bit on chip digitization with a purely digital data interface, and scaling modularity, make it an effective choice for designing detector variants which are optimized for a range of experiments and applications. Improvements on the ASIC operation derived from the experience at LCLS will be discussed.
Another relevant component of this platform is the support electronics in the camera head, which has been optimized in the new implementation of the 140K.
In addition, the LCLS-DAQ system allows for easy integration of several data formats as well as different data sources and handles the readout of multiple detectors into one single experiment-database.
Examples of applications and performance figures of the CSPAD-140k operated at LCLS will be shown.

Primary author: HERRMANN, Sven (SLAC National Accelerator Laboratory)

Co-authors: DUDA, Brian (SLAC National Accelerator Laboratory); KENNEY, Christopher (SLAC National Accelerator Laboratory); WILLIAMS, Garth (SLAC National Accelerator Laboratory); HALLER, Gunther (SLAC National Accelerator Laboratory); PINES, Jack (SLAC National Accelerator Laboratory); HART, Philip Adam (SLAC National Accelerator Laboratory); HERBST, Ryan (SLAC National Accelerator Laboratory); BOUTET, Sébastien (SLAC National Accelerator Laboratory)

Presenter: HERRMANN, Sven (SLAC National Accelerator Laboratory)

Session Classification: PID and Photo Detectors

Track Classification: S3 - PID and Photo Detectors