

Characterization of the First Full Scale HYLITE, an XFEL Pixel Detector Readout Chip

Friday 19 July 2024 20:40 (20 minutes)

HYLITE is a charge-integration pixel detector readout chip designed for Shanghai high repetition rate XFEL and extreme light facility. With a dynamic range of $1 \sim 10000$ photons at 12 keV, the pixel of HYLITE includes an ADC with an automatic gain-switching function. The initial phase of HYLITE development focuses on creating a 64×64 -pixel chip with a $200\text{-}\mu\text{m}$ pixel pitch. The ultimate goal is to produce a chip with 128×128 pixels and a $100\text{-}\mu\text{m}$ pixel pitch.

HYLITE200F, the first full-scale chip of HYLITE, was manufactured using a 130 nm CMOS process. The frame rate of HYLITE200F is 6 kHz in successive readout mode, with plans to enhance it to 12 kHz in the final version. Moreover, HYLITE200F is bump-bonded with a specially designed PIN sensor for joint debugging. The test module comprises four HYLITE200F chips and one sensor and underwent preliminary testing using an X-ray tube. The test results demonstrate that the module can produce images clearly after flat-field correction.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

I read the instructions above

Yes

Primary author: LI, Mujin (IHEP)

Co-authors: ZHANG, Jie (Institute of High Energy Physics(IHEP), Chinese Academy of Sciences(CAS)); WEI, Wei

Presenter: LI, Mujin (IHEP)

Session Classification: Poster Session 2

Track Classification: 17. Technology Applications and Industrial Opportunities