Contribution ID: **71** Type: **ORAL**

64-pixel linear-array Si-APD detector for X-ray time-resolved experiments

Tuesday 4 September 2012 09:20 (20 minutes)

We have developed a silicon avalanche-photodiode (Si-APD) array detector for time-resolved measurements using pulsed synchrotron X-rays. The Si-APD detector had 64 pixels of a linear array, where the pixel size was 100 μm by 200 μm with a 50-μm gap between pixels and a depleted thickness was 10 μm. The detector system was equipped with 64-channel front-end ASICs, FPGAs and SiTCP (a network processor). The prototype system resolved a 10-ns interval of X-ray pulses at a count rate of > 10ˆ7 cps per channel. The nanosecond response and the high count-rate property are extremely valuable for time-resolved X-ray diffraction measurements in pulsed synchrotron radiation. If a detector system can resolve a time interval of shorter than 2 ns, the system will be very efficient for recording an intensity- or position-change of X-ray diffraction spots in nanosecond-order period. We are now in progress of test for the 64-channel Si-APD array detector with synchrotron X-ray beam. The detail of the test results will be presented in the workshop.

Primary author: Prof. KISHIMOTO, Shunji (High Energy Accelerator Research Organization)

Co-authors: Dr YONEMURA, Hiroki (High Energy Accelerator Research Organization); Prof. TANAKA, Manobu (High Energy Accerelator Research Organization); Mr IKENO, Masahiro (High Energy Accelerator Research Organization); Mr SAITO, Masatoshi (High Energy Accelerator Research Organization); Prof. ADACHI, Shinnichi (High Energy Accelerator Research Organization); Mr SHIMAZAKI, Shoichi (High Energy Accelerator Research Organization); Dr TANIGUCHI, Takashi (High Energy Accelerator Research Organization)

Presenter: Prof. KISHIMOTO, Shunji (High Energy Accelerator Research Organization)

Session Classification: Session3

Track Classification: X-ray imaging applications - Material Science