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# High Resolution X-ray Imaging Sensor with SOI CMOS Technology

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A monolithic pixel detector with a 0.2 um fully-depleted Silicon-On-Insulator (SOI) CMOS technology, called SOIPIX, is now being developed. These are utilizing thick handle wafer of SOI structure as a radiation sensor to detect charged particles and X-ray. Therefore, SOIPIX can be applied to the high-energy experiments, astrophysics, medical imaging and so on.
One of the detectors, called INTPIX4, is 10.3 x 15.5 mm in size having 512 x 832 (˜426 k) pixels each 17 um square. It has integration type pixels and implements a correlated double sampling (CDS) circuit in each pixel to suppress the reset noise. It has 13 analog outputs. The stored signals can be read out from them in parallel. The thickness of the sensor is 260 um. Recently, we succeeded to process very high resistivity (˜10 k Ohm•cm) FZ-SOI wafer instead of CZ-SOI wafer previously used. We could achieve full depletion of the sensor with relatively low apply voltage.
As a result of the experiments, we succeeded in the acquisition of a high resolution image with X-ray by back-illuminated. The chart pattern of 25 line pairs / mm (20 um) was clearly obtained in exposure time of several msec at room temperature. More detailed results including gain and energy resolution will be presented.

**Author:** Mr TAKEDA, Ayaki (SOKENDAI)

**Co-authors:** Dr ICHIMIYA, Ryo (KEK/IPNS); Dr MIYOSHI, Toshinobu (KEK/IPNS); Prof. ARAI, Yasuo (KEK/IPNS); Ms IKEMOTO, Yukiko (KEK/IPNS)

**Presenter:** Mr TAKEDA, Ayaki (SOKENDAI)

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