

Medipix – for the educational market

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Technical Description:

The Medipix2 ASIC is a high spatial, high contrast resolving CMOS pixel read-out chip working in single photon counting mode. It can be combined with different semiconductor sensors which convert the X-rays *directly* into detectable electric signals. This represents a new solution for various X-ray and gamma-ray imaging applications. Direct X-ray conversion in a semiconductor sensor minimizes image blurring and avoids an extra conversion stage from X-rays into visible lights. The Medipix2 technology is successfully applied in material analysis (XRD, XRF), Nondestructive testing using X-rays, imaging of small animals, mass spectrometry, and radiation detection. A prototype for a small, portable system has been made, capable of real time measuring of radiation.

Pros:

- Count photons within a given energy region.
- High speed imaging and readout – 20 frames per second.
- High sensitivity, large dynamic range and low contrast detectability, exceeding present charge integrating techniques; dose reduction is a consequence of these features.
- High maximum count rates, allowing for high intensity illumination up to the order of 0.4 GHz/mm².
- No sensitivity to dark currents, allowing for long exposure times under very low intensity illumination.

Cons

- The chip is limited to 256x256 pixels (1.4x1.4 cm). However, the chip is 3-side buttable so an array of 2*n chips is feasible. For instance, a detector comprising four Medipix2 chips gives an active area of 2.8x2.8 cm.

IP Status:

Technology maturity: Currently exclusively licensed for use in medical imaging and material analysis.

Patent status and reference: Not patented.

Accessibility: License available from CERN for other domains.

Market/Application suggestions:

The educational market has been suggested as a niche. The business case of entering the educational market with hardware, software and an educational program would be highly interesting.