Dr Josef Uher
CSIRO Process Science and Engineering,
Lucas Heights, NSW,
Josef.Uher@csiro.au

Medipix semiconductor pixel detectors: their properties and applications

The semiconductor imaging and particle tracking detectors of the Medipix family represent future generation of sensors for various scientific, medical and industrial applications. The Medipix2 detectors consist of a semiconductor diode divided into an array of 256x256 pixels. Each pixel (55x55 μm2 in size) is connected to its own electronics integrated in a readout chip. The electronics contains amplifier, energy discriminator and counter. A number of photons, or particles, which deposit energy above the set threshold, are registered in each individual pixel. The Medipix2 detector allows achieving virtually arbitrary dynamic range, enables energy resolving imaging, provides advantages for beam hardening correction, etc. A good per pixel-based detector characterization is needed for high quality imaging. Our results on detector energy calibration and characterization of the charge sharing between pixels will be shown as well as its implications for applications. Another member of the Medipix detector family is Timepix. This device offers similar properties as the Medipix2 detector, but allows in addition also direct measurement of amount of charge deposited in each pixel. Application of the Timepix device for fast neutron imaging and spectroscopy will be shown.

For further information, please contact Applied and Plasma Seminar Coordinator:
Dr Cenk Kocer (02) 903 66504, cenk.kocer@sydney.edu.au
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