

Monolithic Active Pixel Sensors for soft X-ray detector applications

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Grand Amphi SOLEIL

Séminaires

X-ray detectors are widely used in various applications: from crystallography in material science to imaging in medicine. In most of those applications semiconductor detectors (Si, CdTe, etc.) coupled with CMOS readout chips are used. Thanks to the continuous technology developments in the detector and CMOS manufacture processes, the quality of the data collected by such hybrid systems is improving. For example, the spatial resolution increases because detectors can be manufactured with finer pixels/strips.

However, connecting the detector with pixel sizes as small as $25 \times 25 \mu\text{m}^2$ to a readout chip becomes complicated and expensive. It would be ideal for such fine pitch applications to use the same device as a detector and readout electronics. This could be a niche for the Monolithic Active Pixel Sensors (MAPS) which, up to this day, are mainly used for charged particles detection. Due to the technology constraints their performances in X-ray detection applications were limited. However, recent developments in the field of CMOS production alleviate these difficulties and turn MAPS into an attractive alternative to the hybrid solution in the field of soft X-ray detection.

The presentation will start with the basics of X-ray detectors and the state of the art of the sensor chips hybridized with X-ray detectors. The main part of the talk will deal with Monolithic Active Pixel Sensors, their main features, especially compared to existing pixelated systems, and their applications. The MAPS X-ray detector concept and advantages will be presented together with the measurement results of the first test circuits.



Ce séminaire sera suivi d'une pause-café



Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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