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INVITED: Design challenges of hybrid pixel detectors for spectral imaging

Monday 27 June 2022 14:00 (30 minutes)

Hybrid pixel detectors with spectral imaging capability have multiple energy bins in each pixel capable of creating 'colour' images of an incoming polychromatic X-ray beam. The energy information, which is extracted for each incoming photon, can be used for image contrast enhancement, improved material identification or reduction of beam hardening artifacts in Computed Tomography. One important field of application is medical radiology where clearer images with higher contrast can be produced with reduced dose to patients. Such applications typically require high-Z semiconductor detectors which have high detection efficiency in the range of 10's of keV but which exhibit non-ideal behaviour in terms of charge deposition and collection. Highly integrated CMOS pulse processing with interpixel communication can mitigate many of the sensor non-idealities. In this talk we will review the advantages and challenges of the pulse processing hybrid pixel detector technology for spectral imaging applications with a focus on the new Medipix4 ASIC.

Presenter: LLOPART CUDIE, Xavi (CERN)

Session Classification: Front End