



ID de Contribution: 103

Type: Oral presentation

Développement de spectro-imageurs X durs à haute densité de pixels pour l'imagerie directe de sources astrophysiques et d'éruptions solaires au-delà de 30 keV

jeudi 24 mars 2022 17:35 (10 minutes)

To understand the physical processes behind the most violent events in our Universe, a new generation of space telescopes evolving in the hard X-ray domain is required with enhanced performances in detection sensitivity and angular resolution. Emerging super mirror techniques allow the development of improved resolution and high-energy efficiency spectro-imagers, leading to large focal plane detectors with high pixel density. Modular packaged systems further provide complete front-end features with minimum dead area and tailored to detection plane requirements.

We present MC²-1K, a new generation of hybrid pixelated detectors, with a 32 x 32 pixels array consisting of a 250 μm pitched pixelated CdTe semiconductor detector point-to-point connected to the spectroscopic channels of a full-custom ASIC. The ASIC named D²R2 was produced in 2019 in the XFAB 0.18 μm . We demonstrated a median equivalent charge noise of 54 e⁻ RMS, equivalent to 654 eV at 31 keV for a CdTe detector and a triggering capability for 85% of the frame. We developed an acquisition system where the D2R2 ASIC data of 32 rows are encoded in parallel by the 32-channel ADC OWB-1 ASIC. The daughter board with the hybrid detector will be placed in a thermally controlled vacuum chamber for a moderate cooling in order to perform spectroscopic test of the system.

Field

Instrumentation

Day constraints

Auteur principal: ALLAIRE, Hugo (CEA)

Orateur: ALLAIRE, Hugo (CEA)

Classification de Session: Talk

Classification de thématique: Astrophysics