



Contribution ID: 43

Type: ORAL

Large area low-power Monolithic CMOS Tracking Detectors for FCC-ee

Wednesday 9 October 2024 11:48 (20 minutes)

High voltage CMOS pixel sensors are proposed to be used in future particle physics experiment such as FCC-ee. The ATLASPIX3 chip consists of 49000 pixels of dimension $50\mu\text{m} \times 150\mu\text{m}$, realised in TSI 180nm HVCMOS technology. It was the first full reticle size monolithic HVCMOS sensor suitable for construction of multi-chip modules and supporting serial powering through shunt-LDO regulators. The readout architecture supports both triggered and triggerless readout with zero-suppression.

With the ability to be operated in a multi-chip setting, a 4-layer telescope made of ATLASPix 3.1 was developed, using the GECCO readout system as for the single chip setup. To demonstrate the multi-chip capability and for its characterisation, a beam test was conducted at DESY using 3–6 GeV positron beams with the chips operated in triggerless readout mode with zero-suppression. The detector performance have also been tested with hadron beams and operating both with and without the built-in power regulators. Multichip modules have been operated and behaviour in a serial powering configuration has been tested.

Primary authors: Prof. ANDREAZZA, Attilio (Università degli Studi e INFN Milano); Mr SABATINI, Fabrizio (Università degli Studi e INFN Milano); Mr USTUNER, Fuat (University of Edinburgh); Dr FOX, Harald (Lancaster University); Prof. PERIC, Ivan (KIT); Dr MENG, Lingxin (Lancaster University); Mr GHEEWALLA, Pratik (University of Edinburgh); Mr ZANZOTTERA, Riccardo (Università degli Studi e INFN Milano); Dr DONG, Ruoshi (KIT); GAO, Yanyan (University of Edinburgh)

Presenter: GAO, Yanyan (University of Edinburgh)

Session Classification: Parallel - WG3

Track Classification: WG3: WG3 - Detector R&D