Contribution ID: 65

Laboratory characterisation of TelePix2, the ROI triggering and timing sensor, for the DESY II Test Beam Facility

TelePix2 is a HV-CMOS based upgrade being used at the DESY II Test Beam facility. The fast monolithic sensor provides both region of interest triggering and precise track timing, overcoming ambiguities provided by multiple particles traversing the telescope within a single readout frame, which lasts up to 230 μ s for the MIMOSA26-based telescopes. At current beam intensities, this leads to an average of 6 tracks per event.

Within the project, the summer student shall work on the necessary steps to bring the sensor into regular full user operation. TelePix2 is now being used in test user operation, with only one chip fully qualified. The main objective is to qualify more TelePix2 sensors, to allow for full user operation of TelePix2 alongside further research studies.

The student shall check the functionality of these sensors including chsecking the operation of various functions such as pixel masking, charge injection and the fast output trigger. These studies can be done with an oscilloscope and single pixels or with a digital data stream for all pixels in parallel. The student shall also carry out characterisation to understand the working point of these sensors, including measurements of breakdown voltage, leakage current and power consumption.

The student will work within the existing DAQ and implement the required routines to calibrate the sensors and analyse the obtained data. If possible, sensors that then pass these tests will undergo tuning and have their efficiency and time resolution studied at the DESY II Test Beam facility.

Group

FH-FTX

Project Category

B2. Development of experimental equipment (hardware-oriented)

Special Qualifications

Experience with either Python or C++ at at least a beginners level

Primary authors: WINTLE, Arianna (DESY (Deutsches Elektronen Synchrotron)); HUTH, Lennart (DESY)