

10th Beam Telescopes and Test Beams Workshop



Contribution ID: 30

Type: Talk

ATTRACT FASTPIX Monolithic Pixel Sensor Demonstrator for sub-Nanosecond Timing in Future Vertex and Tracking Applications

Wednesday 22 June 2022 12:40 (20 minutes)

Vertex and tracking detectors for future high-energy physics experiments face stringent requirements in view of their spatial and temporal measurement performance as well as the projected experimental conditions. Within the ATTRACT FASTPIX project, a monolithic pixel sensor demonstrator chip has been developed in a modified 180 nm CMOS imaging process technology, targeting sub-nanosecond timing precision for single ionising particles. It features a small collection-electrode design and contains 32 mini-matrices of 68 hexagonal pixels each, with pixel pitches ranging from 8.66 μm to 20 μm . Various design variations are explored, aiming at an increase in speed and uniformity of charge collection across the pixel area.

This contribution explores arising challenges in characterizing the state-of-the-art pixel sensor demonstrator FASTPIX by discussing the preparation, setup and results of beam tests at the CERN SPS. The talk will cover the CLICdp Timepix3-based beam telescope setup, including upgrades for picosecond time measurements as well as performance results from recent test-beam measurements.

Author: BRAACH, Justus (CERN, Hamburg University (DE))

Co-authors: DANNHEIM, Dominik (CERN); BUSCHMANN, Eric (CERN); DORT, Katharina (CERN, Justus-Liebig-Universitaet Giessen (DE)); MUNKER, Magdalena (CERN); VICENTE BARRETO PINTO, Mateus (Universite de Geneve (CH)); SVIHRA, Peter (CERN); KUGATHASAN, Thanushan (CERN); SNOEYS, Walter (CERN)

Presenter: BRAACH, Justus (CERN, Hamburg University (DE))

Session Classification: Timing