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