

11th Beam Telescopes and Test Beams Workshop



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Beam test of a 180 nm CMOS Pixel Sensor for the CEPC vertex detector

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The proposed Circular Electron Positron Collider (CEPC) imposes new challenges for the vertex detector in terms of pixel size and material budget. A Monolithic Active Pixel Sensor (MAPS) prototype, TaichuPix, based on a data-driven structure and a column drain readout architecture, has been implemented to achieve high spatial resolution and fast readout. In order to verify the spatial resolution of the baseline vertex detector, a detector system consists of telescope and 2 DUTs with different process was setup based on TaichuPix-3 chips and tested at DESY TB21 beamline in December 2022. This talk will presents the characterization of TaichuPix-3 chip, which include the experimental setup, cluster size, spatial resolution, detection efficiency and the corresponding results in different threshold. The offline analysis results indicates the spatial resolution better than $5\mu\text{m}$ and the detection efficiency better than 98%.

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