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Beam tests of pixel-detector prototypes for the CLIC vertex detector

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Hybrid pixel-detector prototypes with small pitch (25-55 microns) and thin sensors (50-300 microns) are currently under study for the vertex detector at the proposed high-energy CLIC electron-positron collider. Test-beam campaigns with hybrid assemblies of planar and active HV-CMOS sensors on CLICpix ASICs and with active edge sensors on Timepix3 ASICs have been performed at the CERN SPS H6 beam line using the Mimosa-based AIDA telescope with rolling-shutter readout as well as a new Timepix3-based telescope with data-driven readout. The performance of the assemblies is evaluated for different operating conditions (bias voltage, detection threshold, rotation angle). We present the status of the reconstruction, alignment and subsequent data analysis. Emphasis will be put on the discussion of a new event model adapted to the data-driven readout scheme of the Timepix3 telescope.

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