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A Triggerless Readout System for Mimosa26 based Telescopes and A Python based test-beam analysis software

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A compact readout-system based on a single FPGA-based readout board (MMC3) and Python software (pymosa) was developed. It supports configuring and readout of up to 6 Mimosa26 planes.
Trigger-less and continuous data taking is implemented, allowing test beams with
high particle rates (> 20 kHz). In order to analyse test beam data a platform independent Python package with graphical-user-interface was developed. The package called "testbeam_analysis" features plane alignment using all translation and rotation axes, Kalman filter based track fitting, and track building from time-reference and high resolution planes. In the talk, the readout-system is presented and challenges from a trigger-less Mimosa26 readout for track building are discussed. Additionally, the basic structure and analysis flow of "testbeam_analysis" is presented, as well as the performance based on measured residuals of a Mimosa26 telescope in a 2.5 GeV electron beam at the new test beam area in Bonn.

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