

ECALp TB 2025 preliminary results

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Plan of the presentation

1. Data integrity
2. Noise measurement
3. Calibration
4. Plans

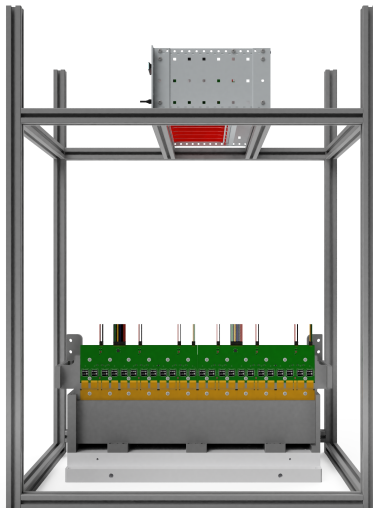


Test-beam 2025

In June 2025, we held a beam test at DESY in Hamburg.

Test-beam 2025 objectives:

- ▶ Evaluate the functionality of a new 256-channel silicon sensor prototype.
- ▶ Test performance of calorimeter equipped with 11 layers
- ▶ Test new DAQ
- ▶ Test mechanics



Data integrity - zero suppressed vs raw data

Our DAQ saves two type of data Zero Suppressed, with calculated signal amplitude and time of arrival of triggered channel and full raw ADC samples for all detector channel.

Raw data consumes around 250 times more storage space in comparison to ZS data.

Data integrity mainly focuses on comparison event to event, plane to plane and channel to channel reconstructed parameters for example amplitude from both type of data.

Noise analysis - raw data

The new mechanics and amount of cabling were a challenge from a noise management perspective.

- ▶ Noise structure
- ▶ Noise correlation map
- ▶ Faulty channels detection
- ▶ Common noise subtraction methods
- ▶ SN ratio around 12.5

Calibration - ZS data

Based on data obtained during runs with a 5 GeV electron beam and without a tungsten absorber between the detector layers, the most probable value of the Landau distribution was calculated for each measurement channel. This value corresponds to the most probable energy deposited by minimal ionizing particles, which should be uniform across all channels. The differences in this calculated value will serve as calibration parameters in future analyses.

Plans

Plans for the future analyses:

- ▶ Refining reconstruction methods from raw-data
- ▶ Calibration of all instrumented channels
- ▶ Merging calorimeter data with test-beam telescope
- ▶ Analysis of runs with different energy and angle
- ▶ Comparisons of test-beam results with simulations

Thank you for attention