Report from the positron WG

ECALP beamtest - completed last week

1. The apparatus was a mechanically almost complete ECAL (9 out of 20 tungsten plates), with 2 (out of 6) partly instrumented towers (10 sensor layers each (with 20 for fully instrumented).

2. Without insertion of the tungsten plates the calibration of all read-out channels was performed by sweeping the electron beam spot over the tower surface

3. With tungsten plates (using additional tungsten plates from FCAL) the following studies have been done:

- Shining with the 5 GeV beam over a predefined grid of (x,y) points, data is taken to measure the homogeneity of the ECAL response
- High statistics data is taken at 5 GeV in the center of ECAL and the gap region.

- Directing the beam in two predefined positions in the center of the ECAL high statistics data is taken for shower profile measurements and comparison with MC. These measurements were supplemented with additional FCAL tungsten plates in front, study the tail of the showers.

- The latter measurements have been repeated in the energy range between 1 and almost 6 GeV

- Using roughly the same beam impact positions data is taken changing the ECAL angle by 5 and 10 degrees and energies
- of 5 and 2 GeV (realistic conditions in the current LUXE design)

4. All data is taken with the beam telescope. the statistics of each measurement is roughly 10**6 trigger, high statistics runs 10**7 trigger.
5. Data generally taken in raw format (all ADC samples readout out) and after preprocessing using FPGAs (to reduce the amount of data).

All systems worked almost perfectly!

ECALP mechanical structure in beamtest at DESY June 2025

9 new tungsten plates, one old in front



9 new tungsten plates, 11 old in front



25/06/2025

LUXE SB meeting, HA

Tracker status

1. Aftermath of direct hit on WIS

Our lab did not seem to be affected, this is based on the visual tests, though we did not have a chance to make a functional tests of all components.

We moved the components reserved for LUXE (staves and MOSAIC boards) to some safer place, hopefully there will be no mechanical stress tests of that kind and intensity anymore.

2. Current activity

We are exploring ALPIDE chips in E320, developing and testing track reconstruction procedures in high occupancy level, absolutely dominated by the background.

This is not directly related to LUXE, but can be well treated as an advanced beam test which helps us to learn the detector performance, including challenges in synchronization with other accelerator and laser systems.