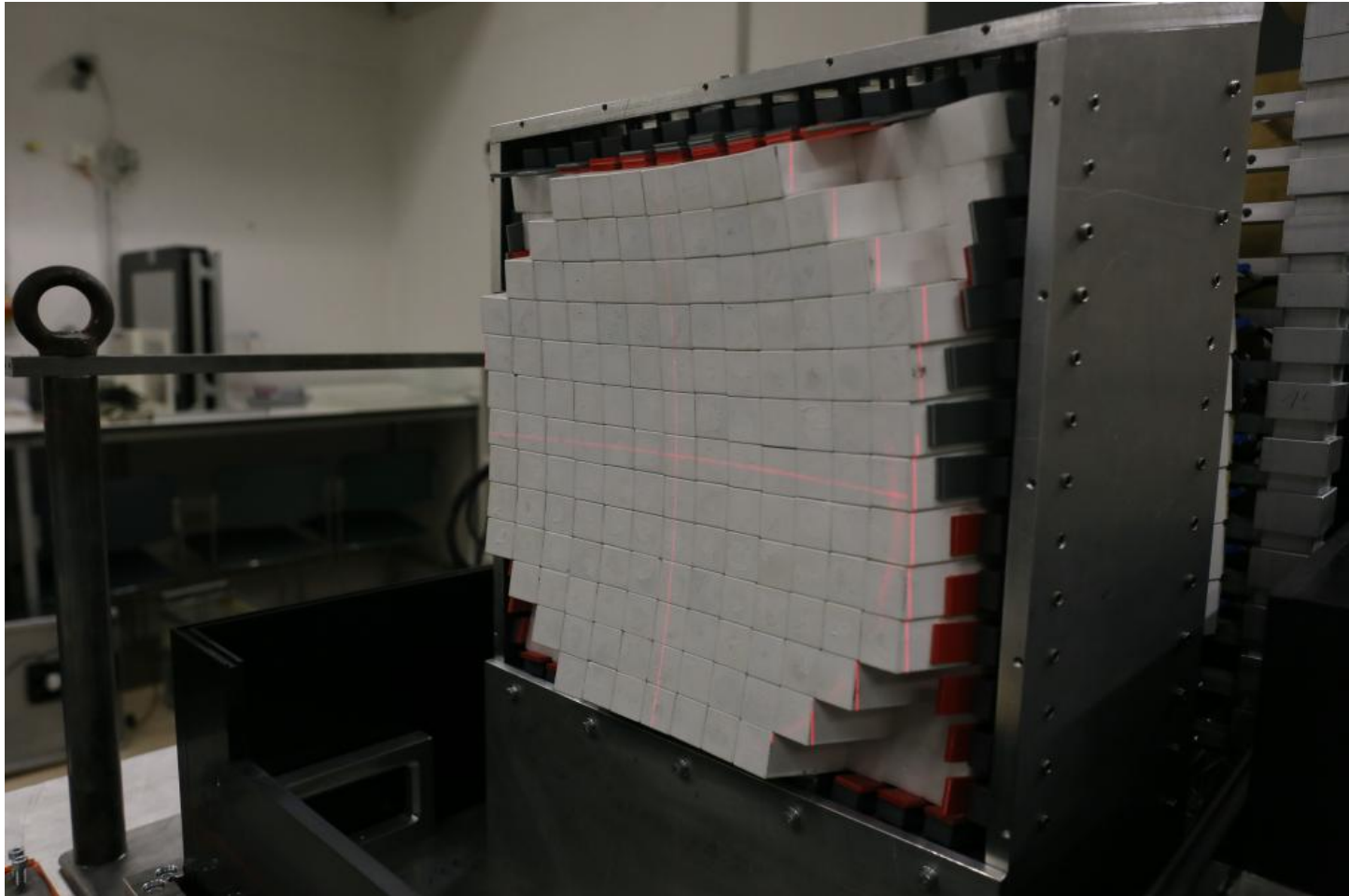


Preliminary test beam results of the Aachen calorimeter

Max Emde & Ronja Hetzel
Physics Institute III B, RWTH Aachen
Analysis of FOOT Performances Skype Meeting

Set-up



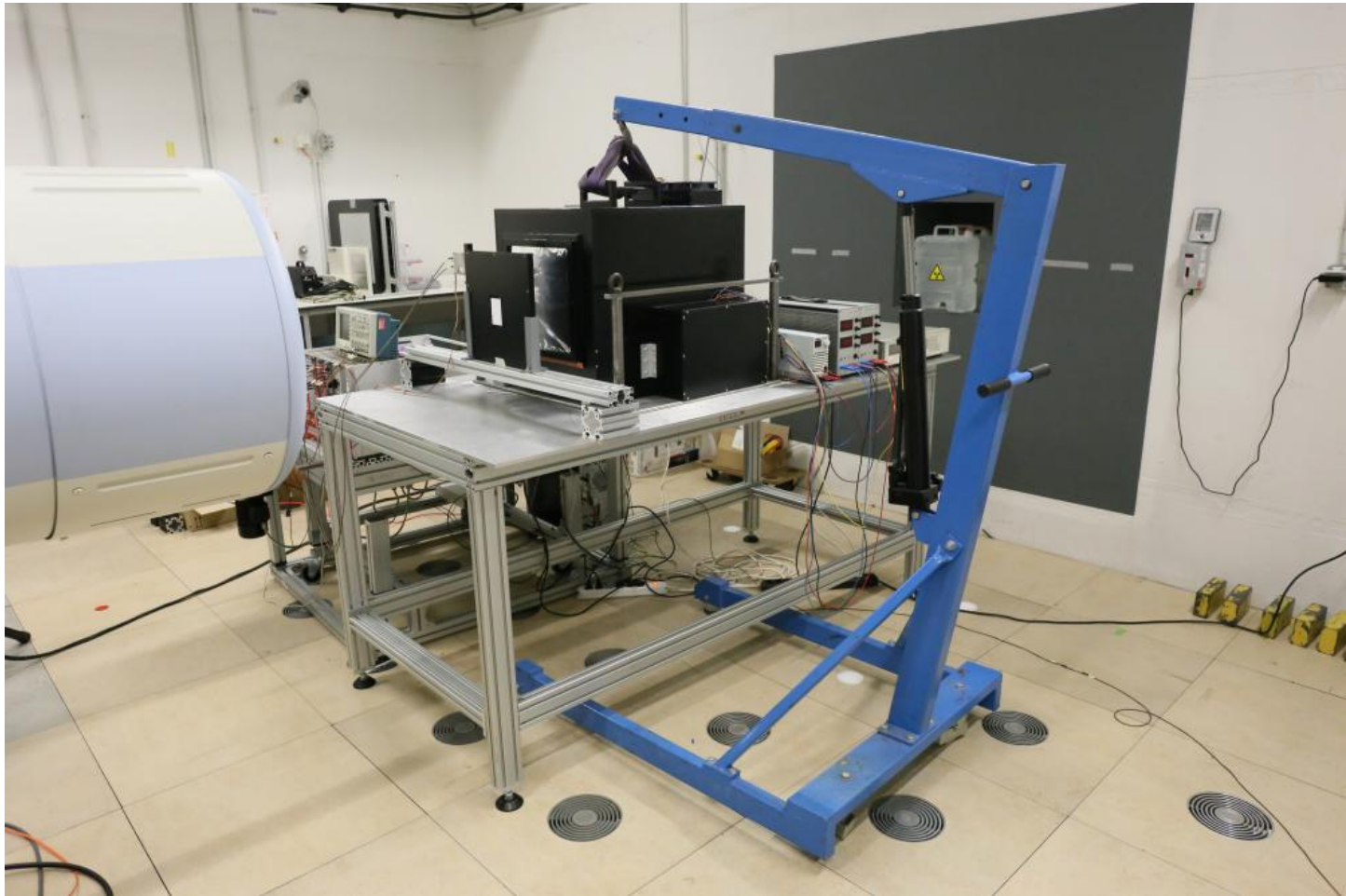
Calorimeter: 145 BGO crystals from L3

8 May 2018 Preliminary test beam results of the Aachen calorimeter

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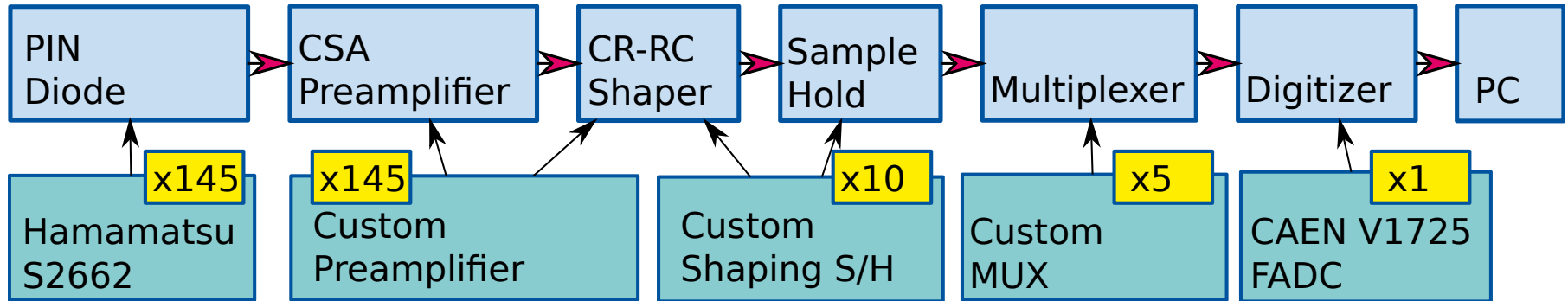
Max Emde & Ronja Hetzel

Set-up



Light tight box with entrance window from aluminium foil, external trigger

Read-out



Readout Scheme:

- One preamplifier board per cell, including high-pass filter
- 16 cells per sample-and-hold board, including low-pass filters
- 2 S/H boards connected to one multiplexer
- Up to 8 multiplexers per FADC with a CAEN V1725 digitizer
- Cell voltage reconstruction done in software

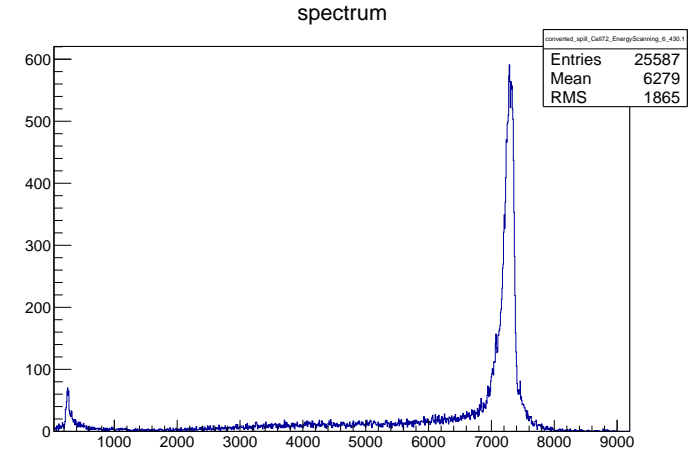
Measurements

Scan of all cells

- Hit each cell once
- Carbon beam with 200 MeV/u
- Study differences between cells

Energy and particle dependent response

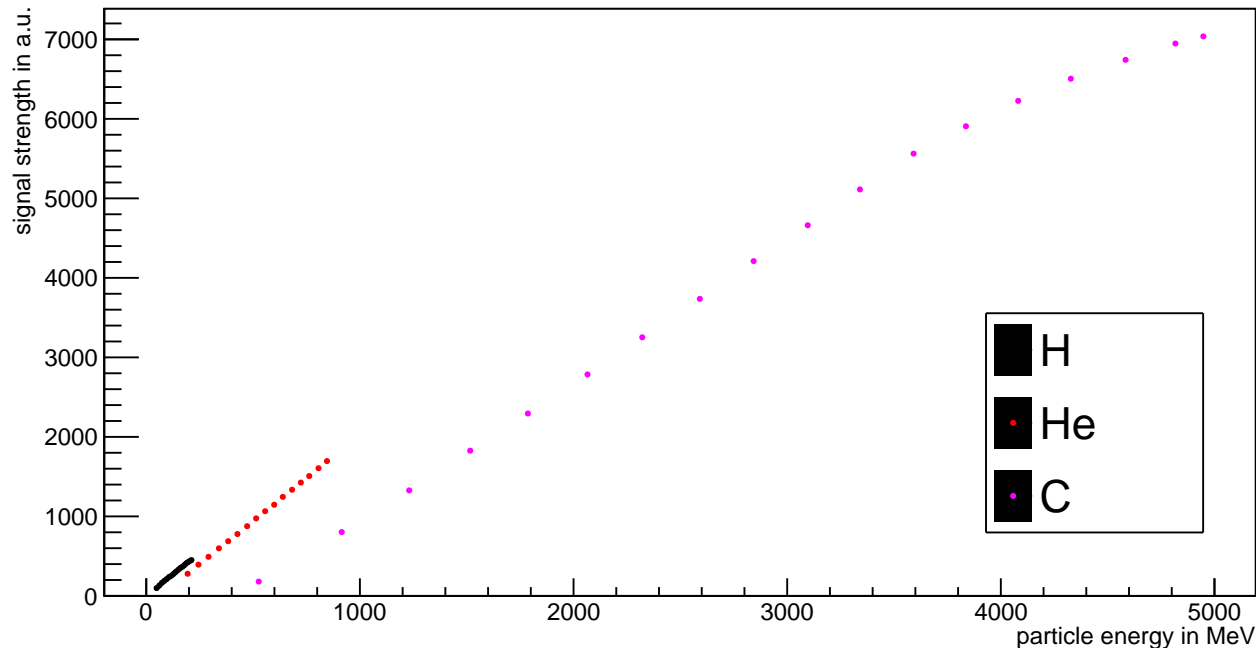
- Different particles with different energies on one cell
- Proton beams with 18 energies from 50 MeV/u to 220 MeV/u
- Helium beams with 18 energies from 50 MeV/u to 220 MeV/u
- Carbon beams with 18 energies from 100 MeV/u to 430 MeV/u
- Study differences in response and resolution depending on energy and particle type



Carbon with 430 MeV/u

Detector Response

- Energy corrected for losses before reaching calorimeter
- Differences for particles types
- Non-linearity especially for carbon
- High energies
- Does not reach 0 for low energies



Energy Resolution

- Energy corrected for losses before reaching calorimeter
- From peak width of spectra
- Includes contributions from beam energy spread, detector and electronics
- Reaches 1 % to 3 %

