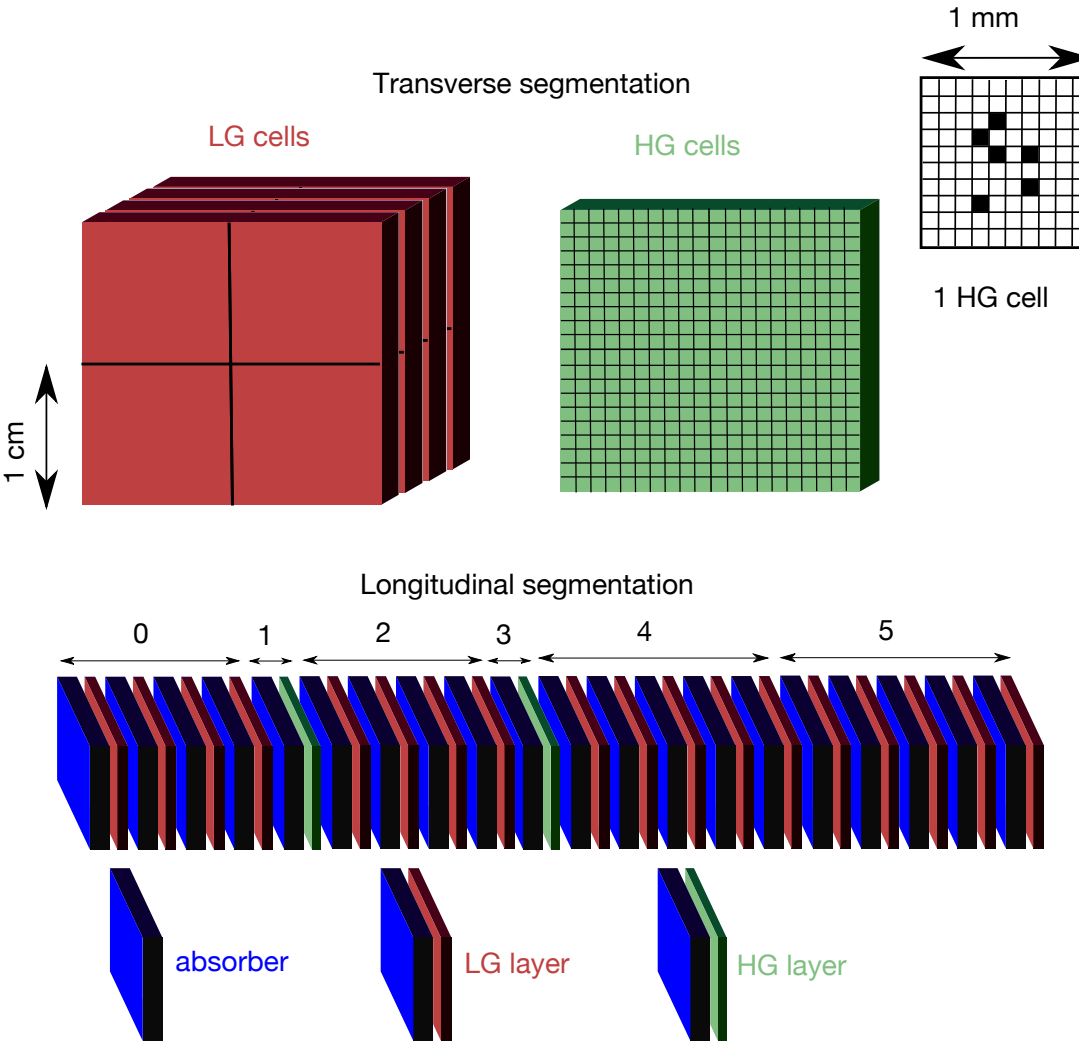
ALICE-FoCal Testbeam @ PS/SPS

Norbert Novitzky for the FoCal team

The FoCal concept



The detector is a **sampling detector** using alternating W and Si layers. To meet the required **two shower separation** a novel design is explored, using two different technologies of the Si layers:

- The Low Granularity (LG) layer

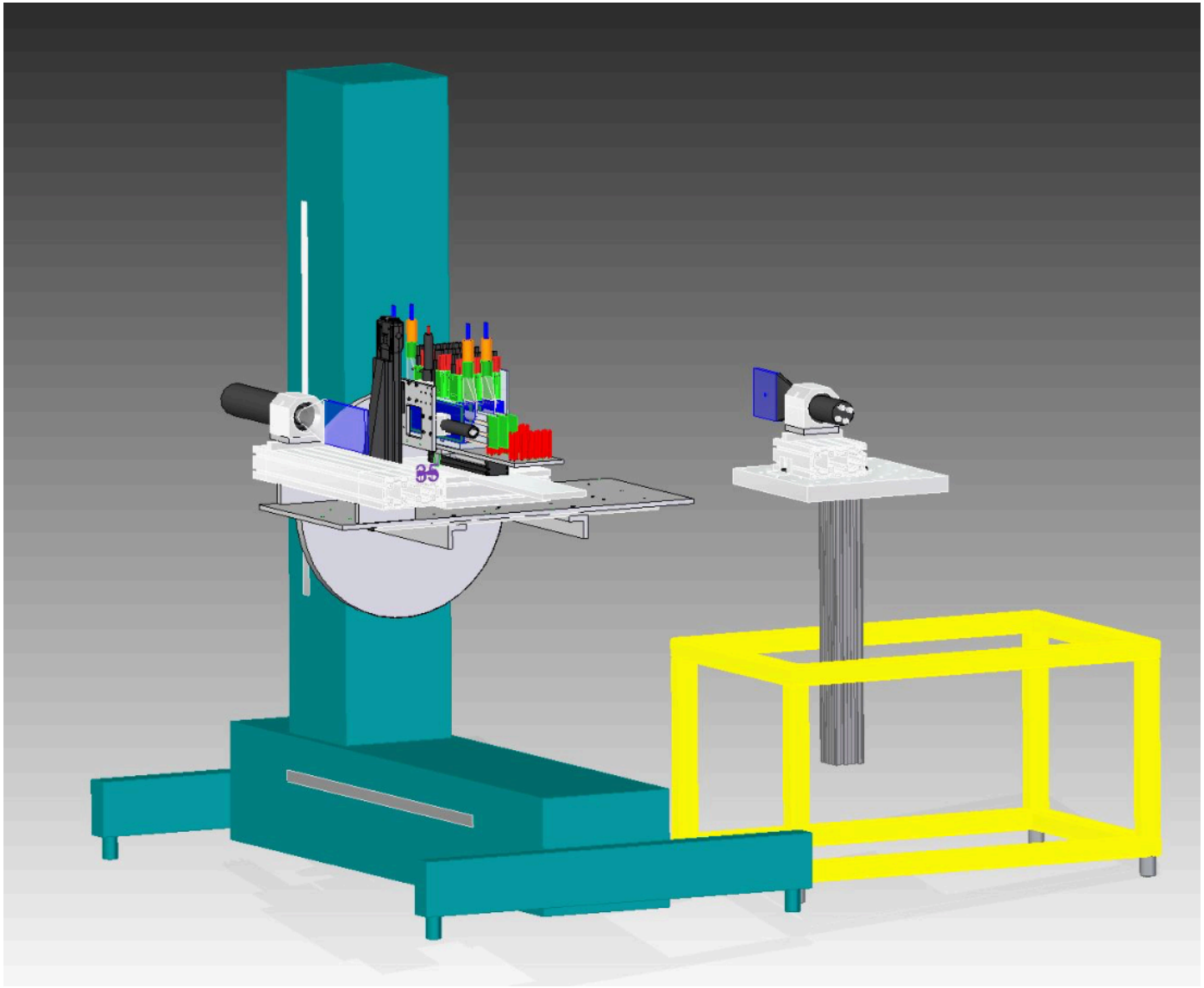
  Advantage of very good **energy** measurement

- High Granularity (HG) layers

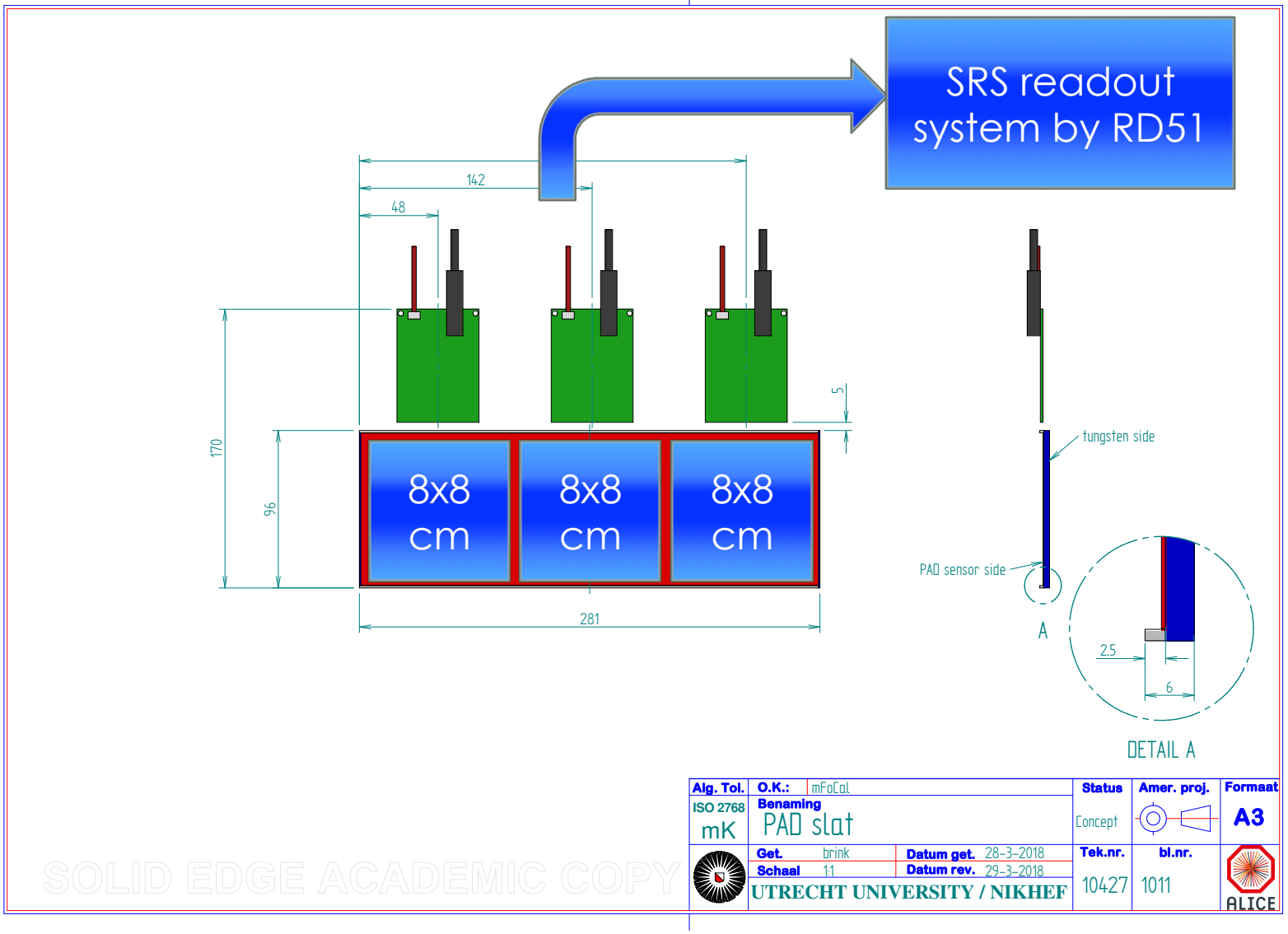
  Advantage very good **position** measurement

To be installed in ALICE in 2024

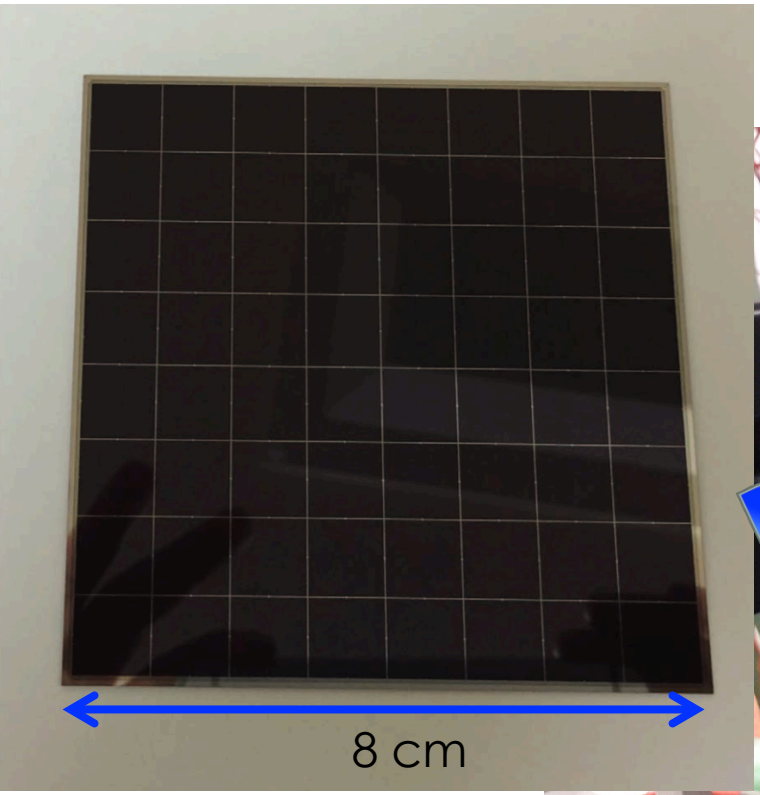
Testbeam setup schematics

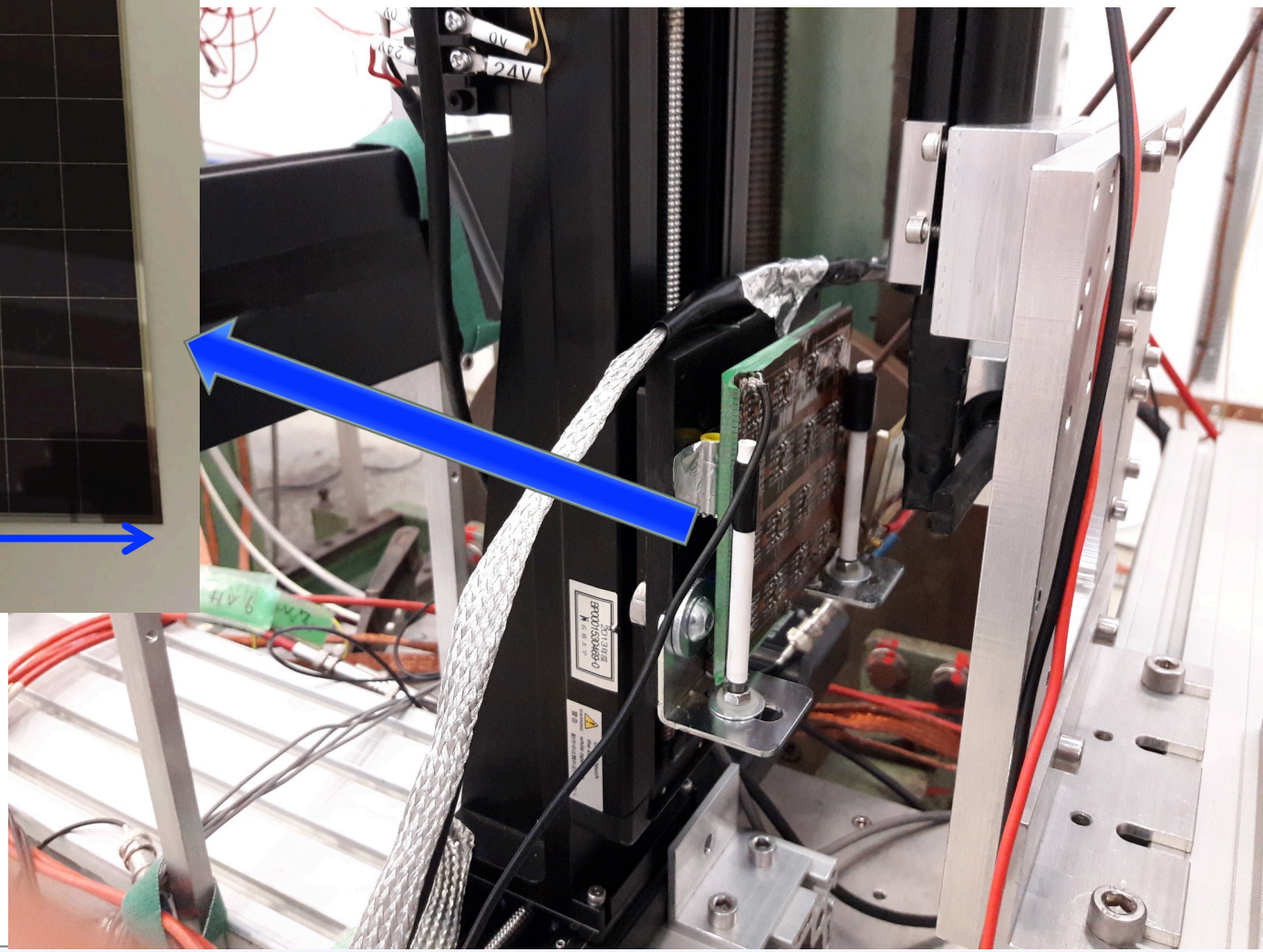


Basic building block

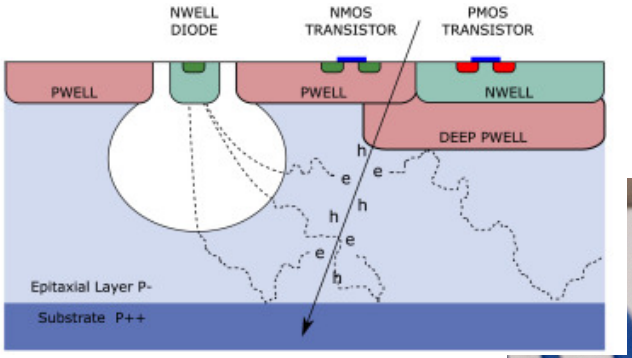


LG prototype



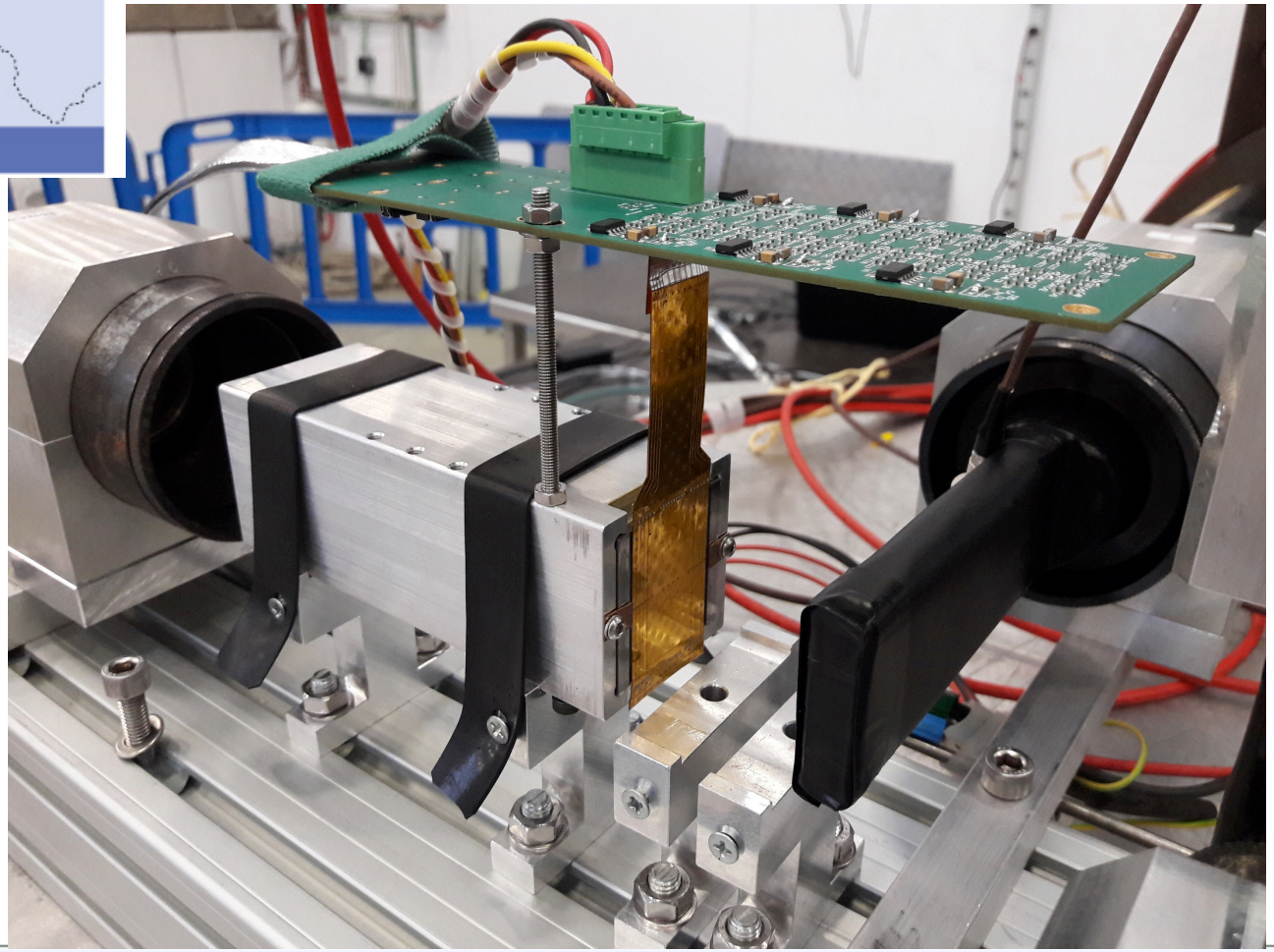


HG layer prototype

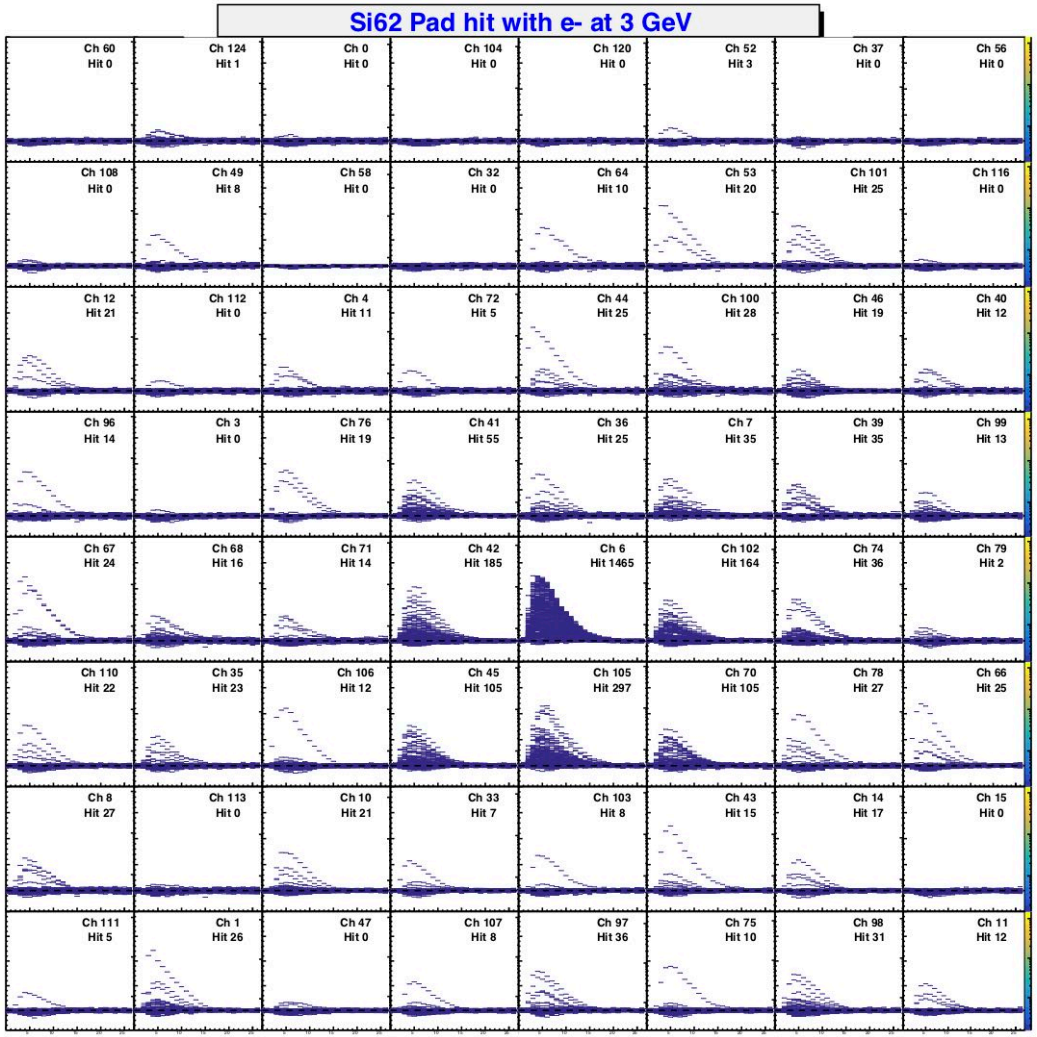


Developed for the ALICE-ITS upgrade

Very small pads !
30μm for the shower separation



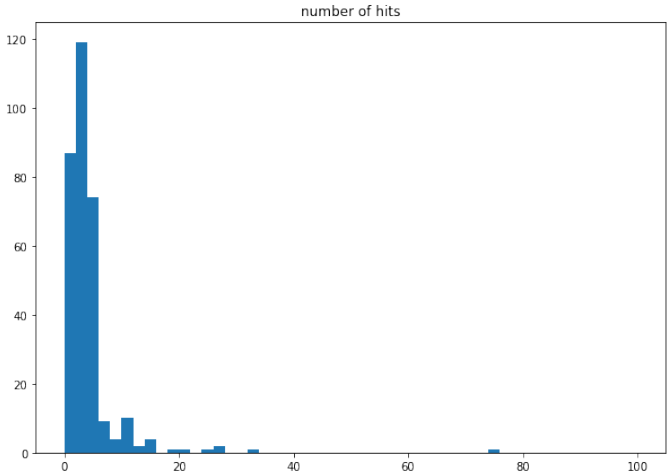
LG layer readout example

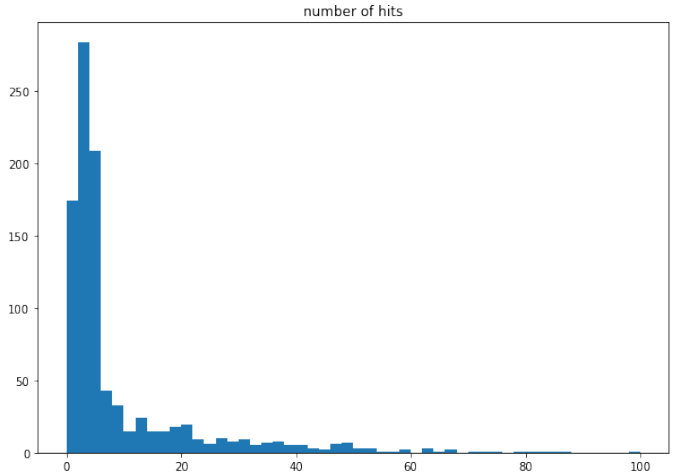


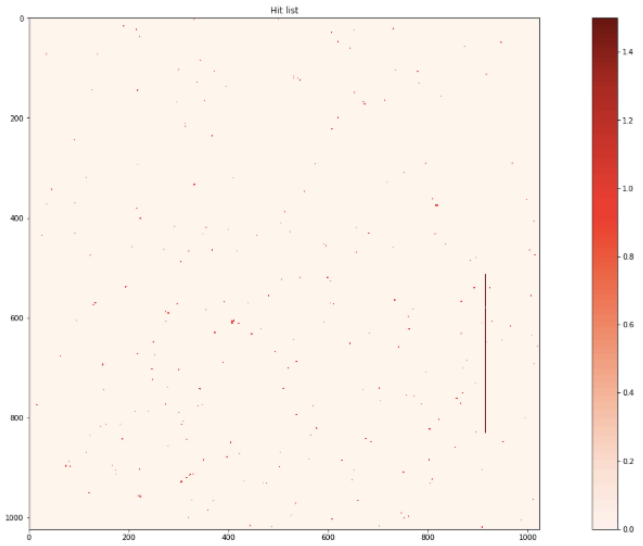
Apologies for the low-resolution (too large in pdf format)

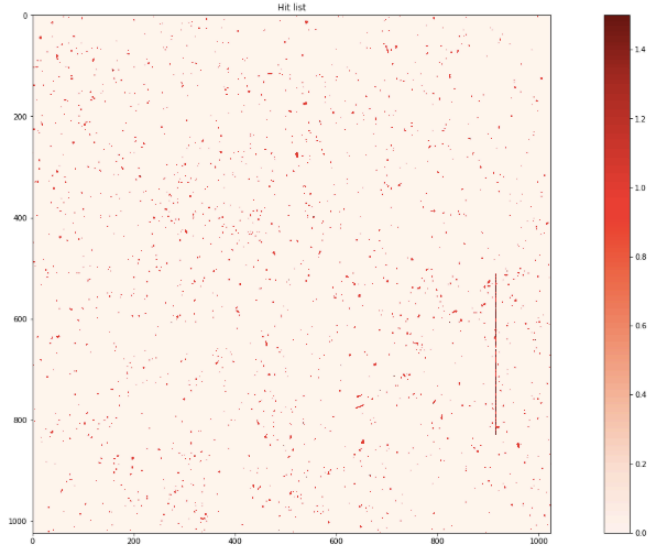
- Basic mapping done
- 3 GeV electron beam shooting to the [4, 3] position (ch = 6)
- Couple hundred accumulated hits with 3 tungsten layers in front

HG layer readout example









9 GeV hadron beam

Two event examples from the ALPIDE chips

This is a first test with the ALPIDE in calorimeter setup.

Summary, preparation for SPS

- Successful testing of the sensor in PS:
  - Measurement of the MIP peak in different locations:
    - We can estimate the charge sharing between pads and calibrate the detector
  - Measurement of the EM shower with different tungsten layers in front:
    - Energy range 1-5 GeV
  - First testing of the ALPIDE chip for the calorimeter setup
- Preparation for the SPS:
  - 6 layers should arrive next week:
    - 6x3 sensors (18 times more what we had in PS)
  - 13 layers should arrive later, making in total 19 layers, plus the sensor from PS (first layer)
  - Continuing test with the ALPIDE chip setup

Thanks to all

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Tsukuba: Tatsuya Chujo, Motoi Inaba, myself

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