# DESY TPC Activities

LCTPC WP 256
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Testbeam Setup and Large Prototype
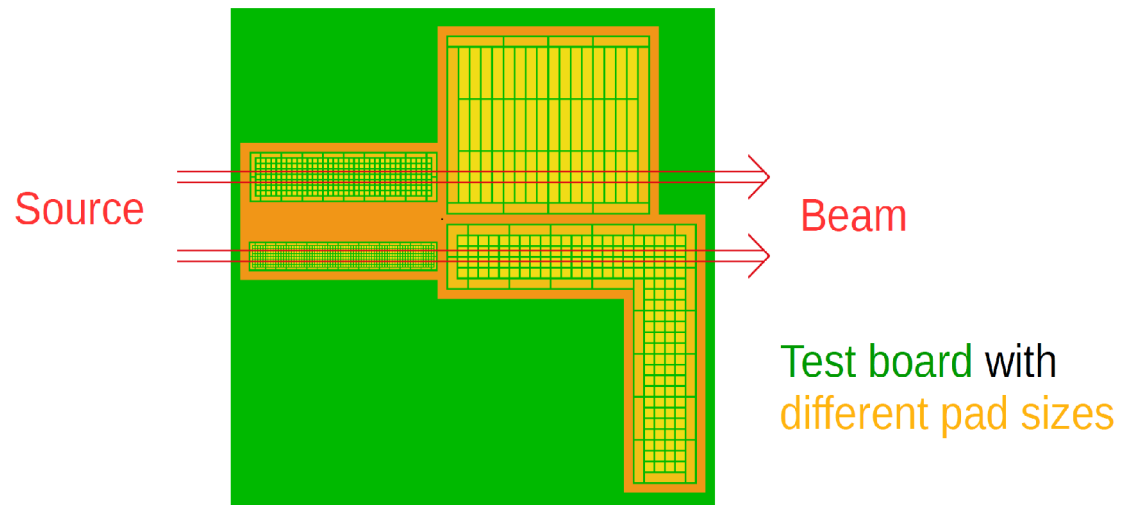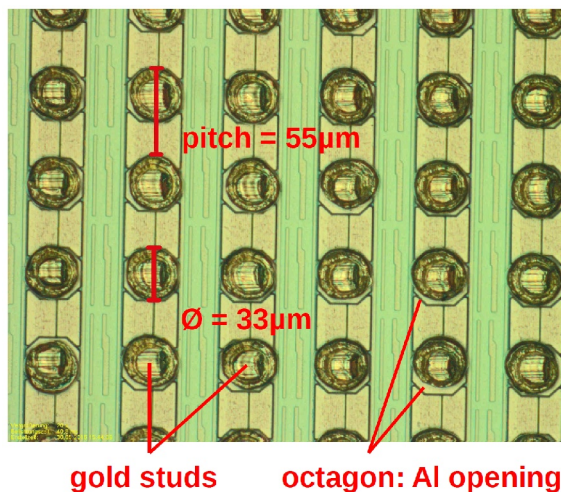
- PCMAG and Stage

  - Brake for "ghost" rotation (in magnetic field)

  - New screw drive for horizontal movement (higher precision, no brake necessary)

- External Silicon reference tracker

  - Decision to use KPix and Si-strip sensors

    - Sensors ordered, delivery in late spring

  - Design of mounting structure

  - DAQ integration and trigger in progress

- Oil filter for ALTRO cooling air

- Large Prototype

  - 2nd field cage: design of mandrel final, production preparation in progress

  - Improving module mounting tool

GridGEM Module

- GEM Mounting

  - Improved mounting/stretching/gluing procedure
    → consistently 2 times better flatness
    (RMS: 50-90µm → 30-50µm)

  - Production process well under control

- Readout

  - Improved connector "clamps" → improved on dead channels

  - Electronics calibration by pulsing lowest GEM

- Successful testbeam in December

  - Standard runs including larger angles

  - Double track: ½ X_0 target in front of LP

  - Runs at minimal ion backflow settings

- Long term GEM stability

  - Tests with baked GEMs (Cu-oxide layer):
    good gain + improved trip stability

  - Further tests in the next months
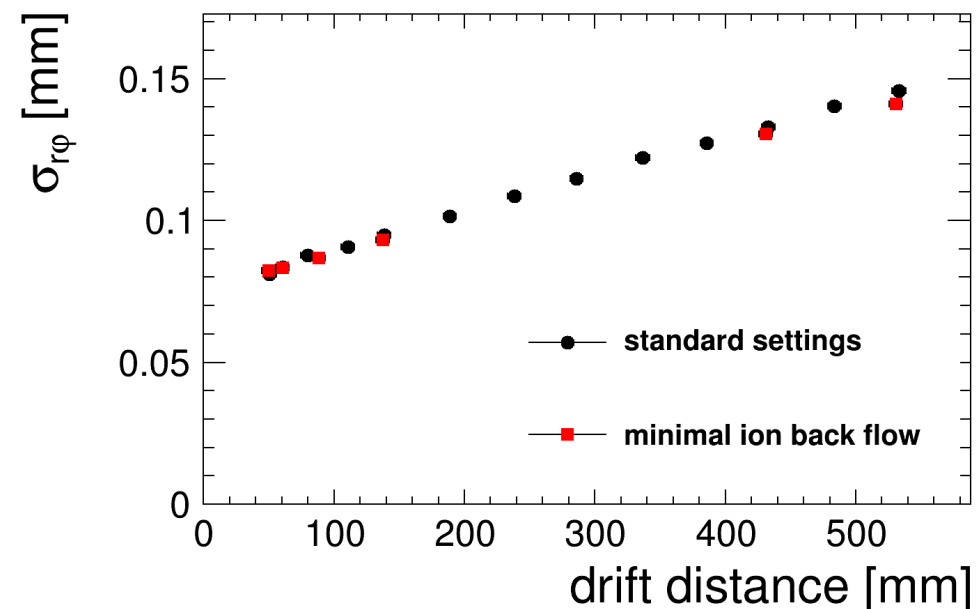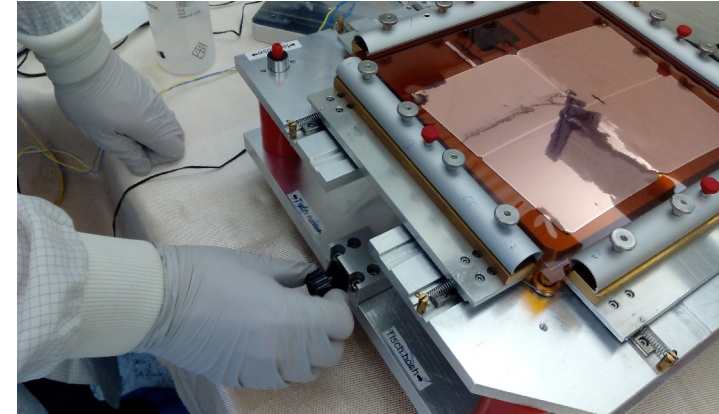
- Using pixel chip with pads

  - High flexibility in pad sizes → cluster counting

- R&D if pads can be read out with Timepix

  - Highly integrated readout

- Small prototype testing: proof-of-principle

  - Test board in production, expected end of January

  - → Bonding (tests successful)

pitch = 55μm

Ø = 33μm

gold studs   octagon: Al opening

Source

Beam

Test board with
different pad sizes

- Work on double track and double hit reconstruction and analysis

- Timepix and Pads:

  - Work on detailed TPC simulation and reconstruction ongoing

  - Using astro-physics "source extractor" package to identify clusters

- "Local Road Search" track finder for Timepix

  - Adjustment for pad based data in progress

- ILD simulation

  - Improving and testing DD4Hep ILD TPC detector model

- Staff
  Ties Behnke (head), Ralf Diener, Oliver Schäfer, Claus Kleinwort

- Postdocs
  Felix Müller (TB, module, analysis), Dimitra Tsionou (ext. Si reference)

- PhD students
  Ulrich Einhaus (Timepix, simulation), Oleksiy Fedorchuk (HV, Garfield, analysis),
  Uwe Krämer (ext. Si reference), Paul Malek (GEM module, analysis)

- Bachelor student
  Lisa Waldmüller (baked GEM tests)

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