STOCK TAKING MEETING

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AG BIEBEL: LMU ATLAS

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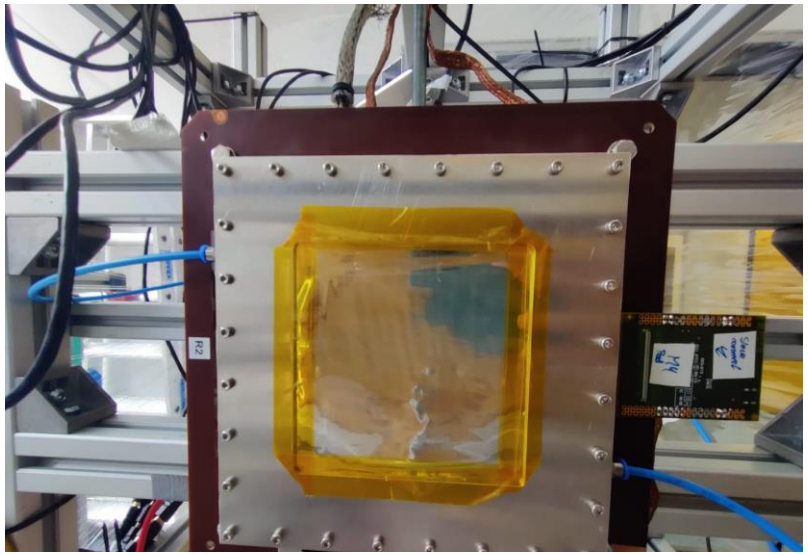
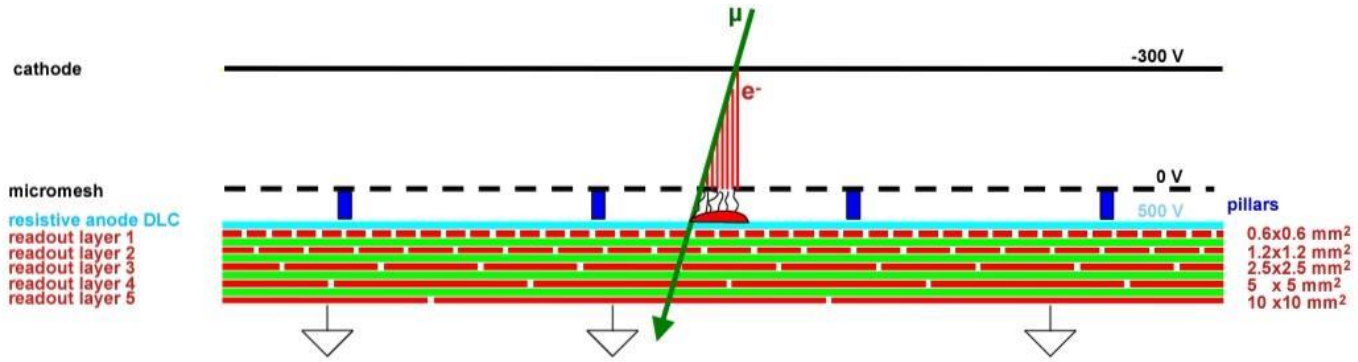
THESIS TOPIC: CHARGE SHARING MPGDs

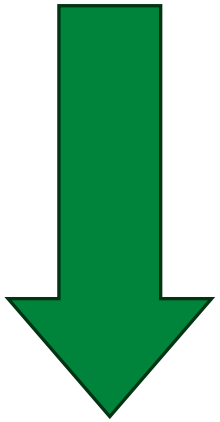
- Basic Idea:
  - Reduce the number of readout channels strongly by charge sharing on consecutive / stacked readout layers
  - Additionally, reduce the number further by novel strip-like readout (Master student)
- Motivation:
  - Spatial resolution around 100 µm
  - 2D resolution (X,Y) pixel detector with very low number of readout channels





Timeline

2024

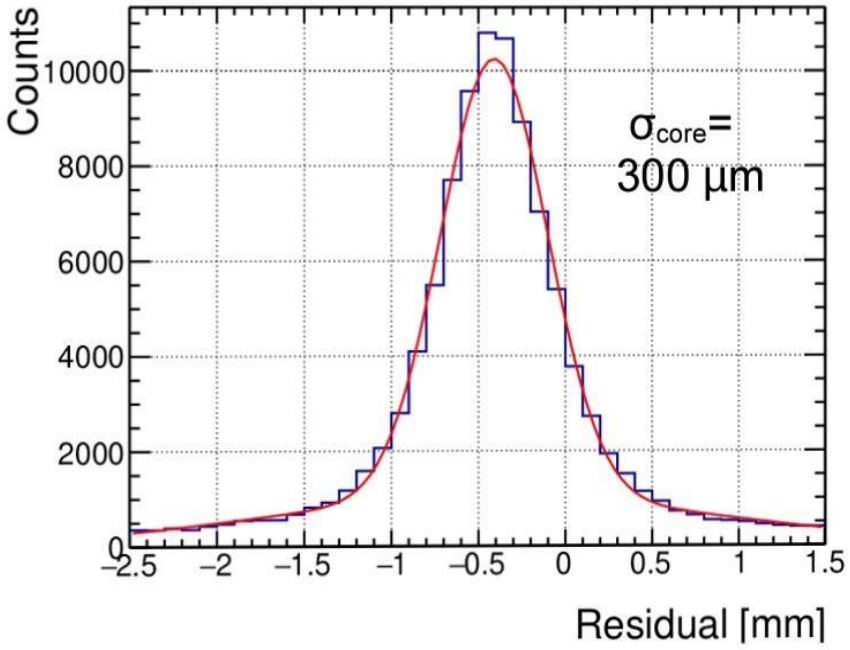


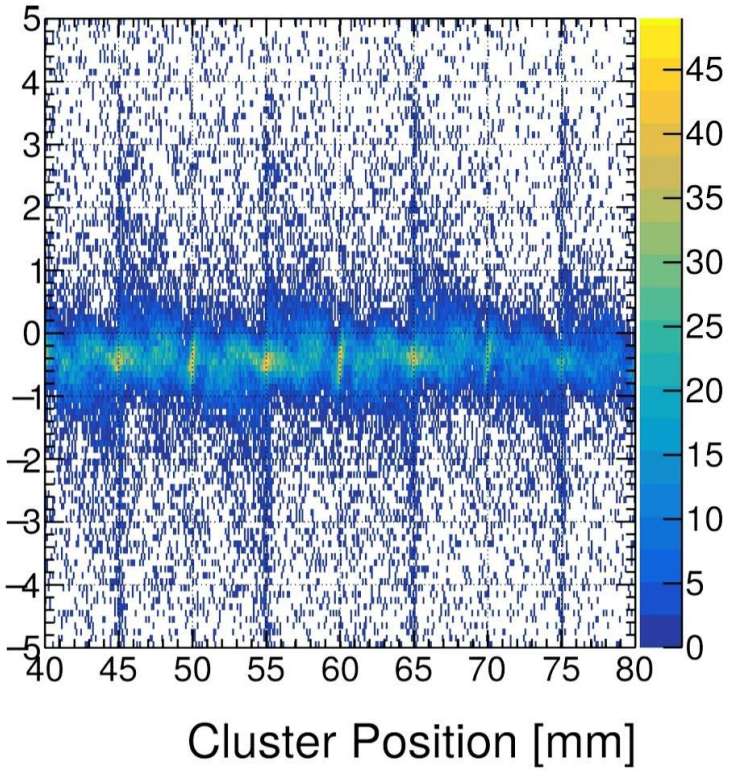
2025

- Qualification Task for ATLAS: Front end electronics upgrade of MDTs for the Cosmic Ray Facility in Garching
- Installation of the detectors in a telescope for energy resolution testing using 55Fe 8.9 keV gammas and muon measurements
- DAQ and data analysis for perpendicular and inclined tracks (including multiple particle tracks)
- Potential Beamtime in 2025 (with DRD1 collaboration group)
- Additionally taking part in conferences and schools (VCI, ISOTDAQ, DRD1 collaboration meetings)

Current Status

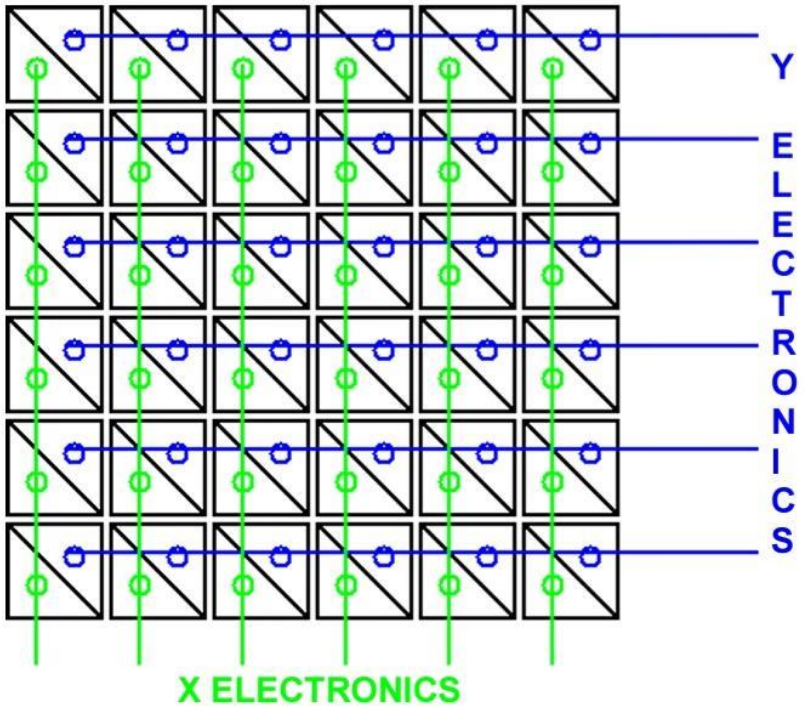
- Core residual = Postrack – Posdet
- Core resolution ~ 300 μm with broad tails
- Periodical substructure observed -> 5 layers might be too many



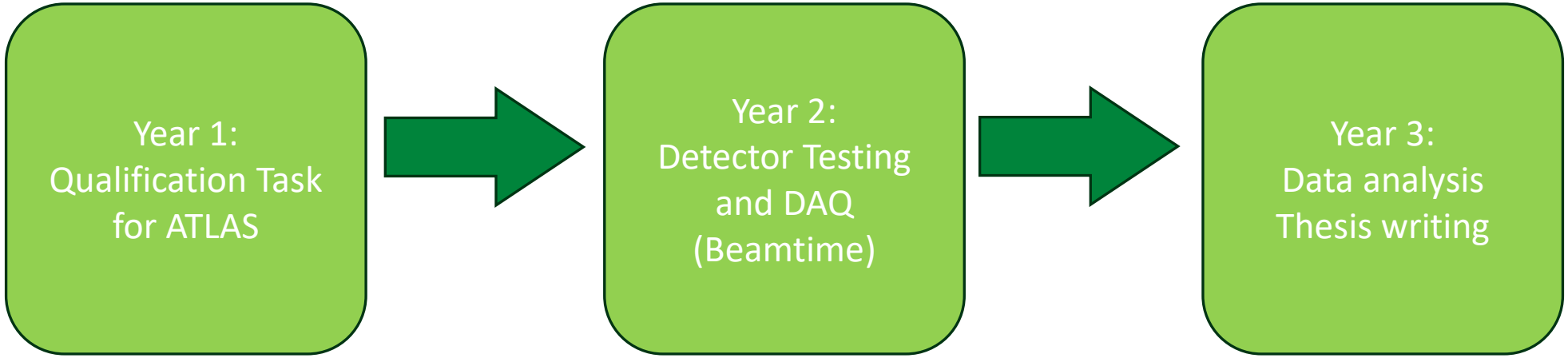


Current Status

- Five layers proved to be too many: a 3 layer pad detector with strip like readout developed
- 0.3 -> 0.6 -> 1.2 mm with pixel readout => 84 × 84 = 7056 readout channels
- With the strip like readout, it can be reduced to 84 + 84 = 168 readout channels



ROAD MAP


Year 1:
Qualification Task
for ATLAS
Year 2:
Detector Testing
and DAQ
(Beamtime)
Year 3:
Data analysis
Thesis writing