

Status of the Test-Station for Silicon-Strip-Detectors in Bonn

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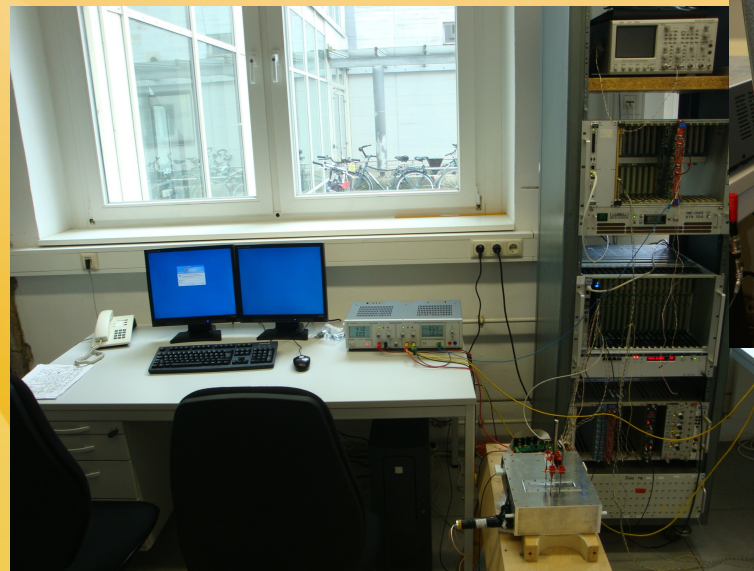
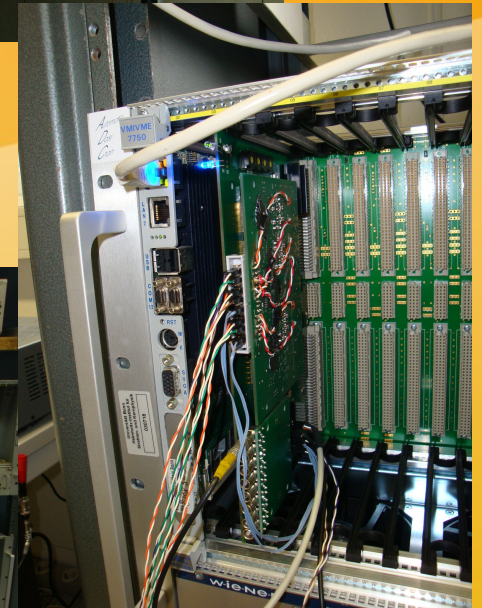
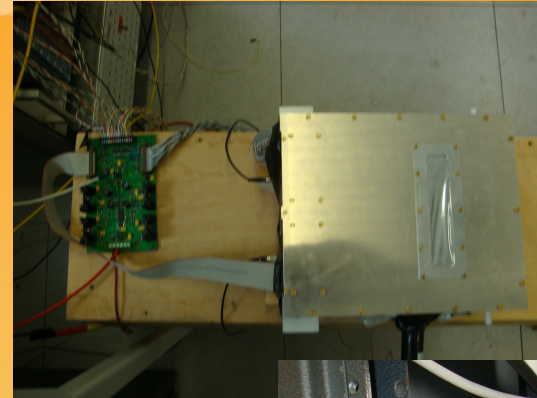
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Bonn Test-Station

Lab Setup in Bonn

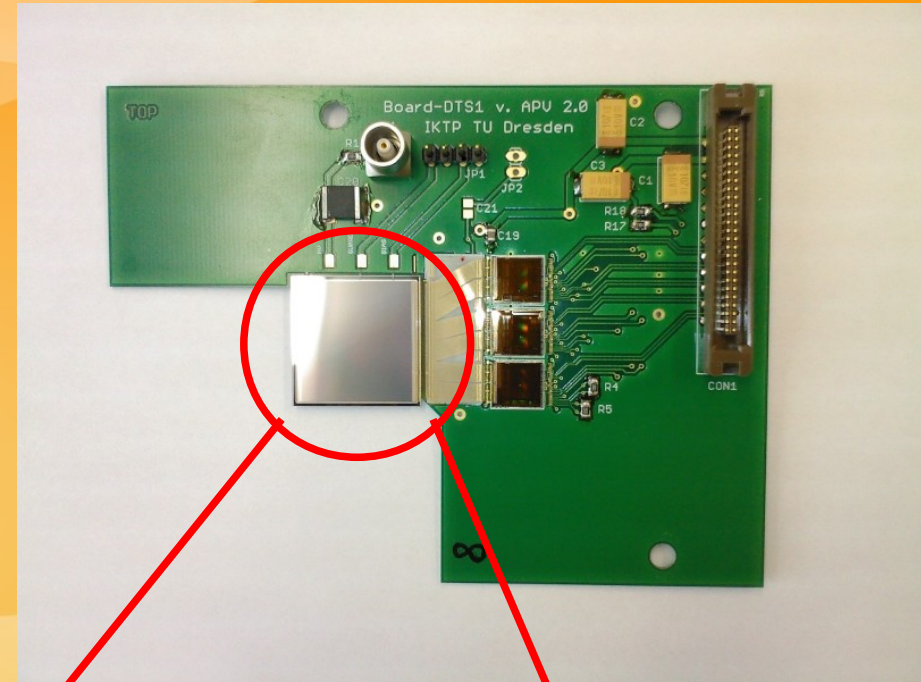
- Si-strip sensor box with Supply Board
- VME-Crate with FPGA Board
- New Mezzanine 65MSPS ADC
- PC



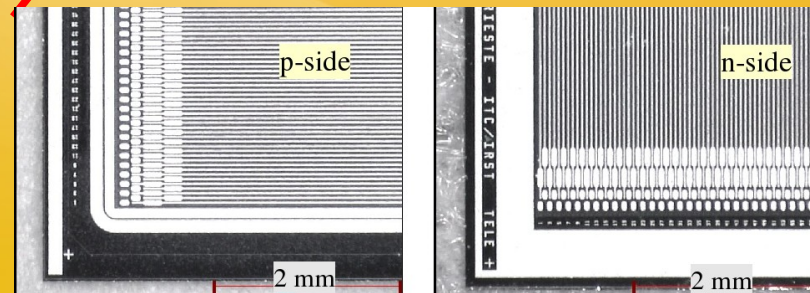
Bonn Test-Station

Sensor-L-Boards

- L-shape for double sided mounting
- Sensor ⇒ Pitch Adaptor
⇒ Front-Ends (APV25)



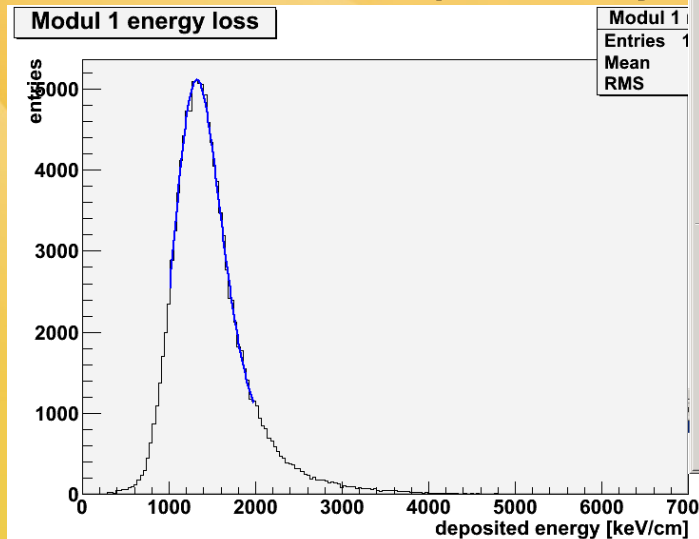
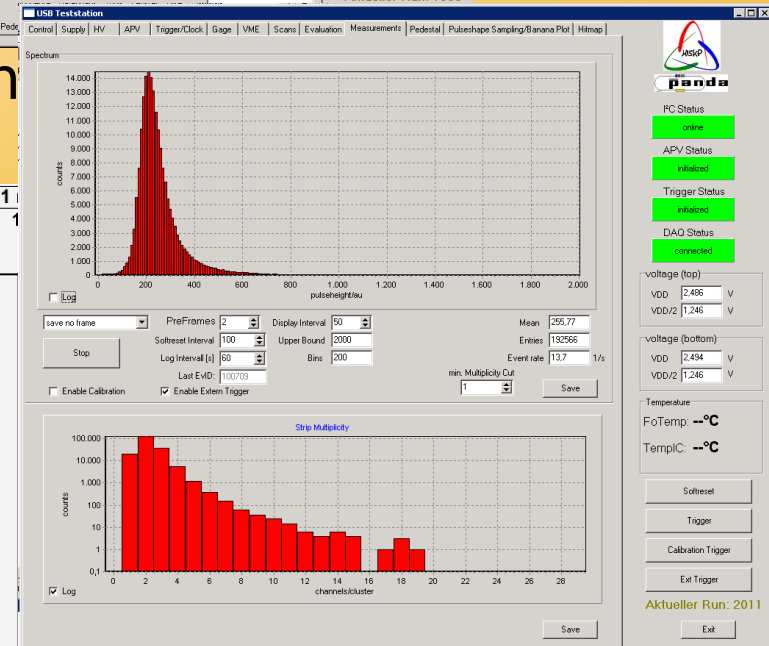
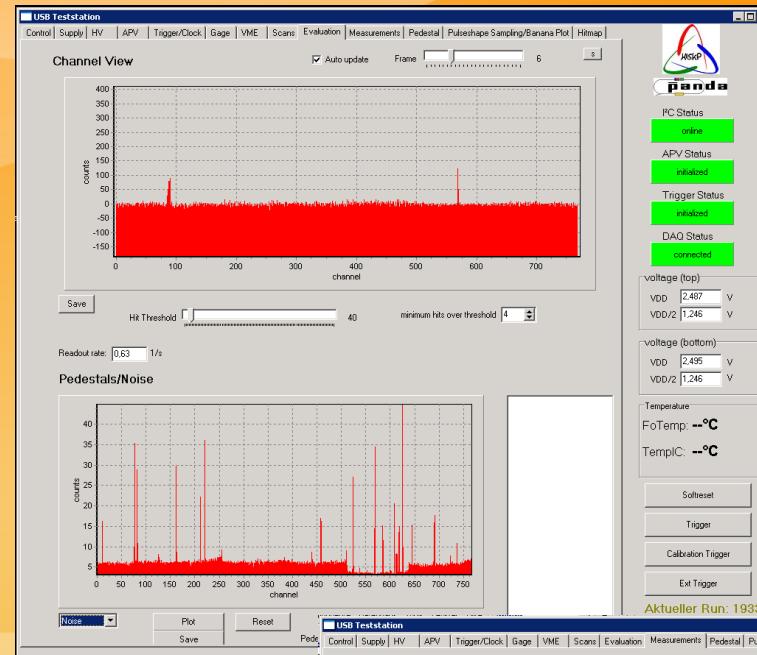
- Sensor: Size 2x2 cm², Pitch 50μm,
385 strips (n-side),
385 strips (p-side)



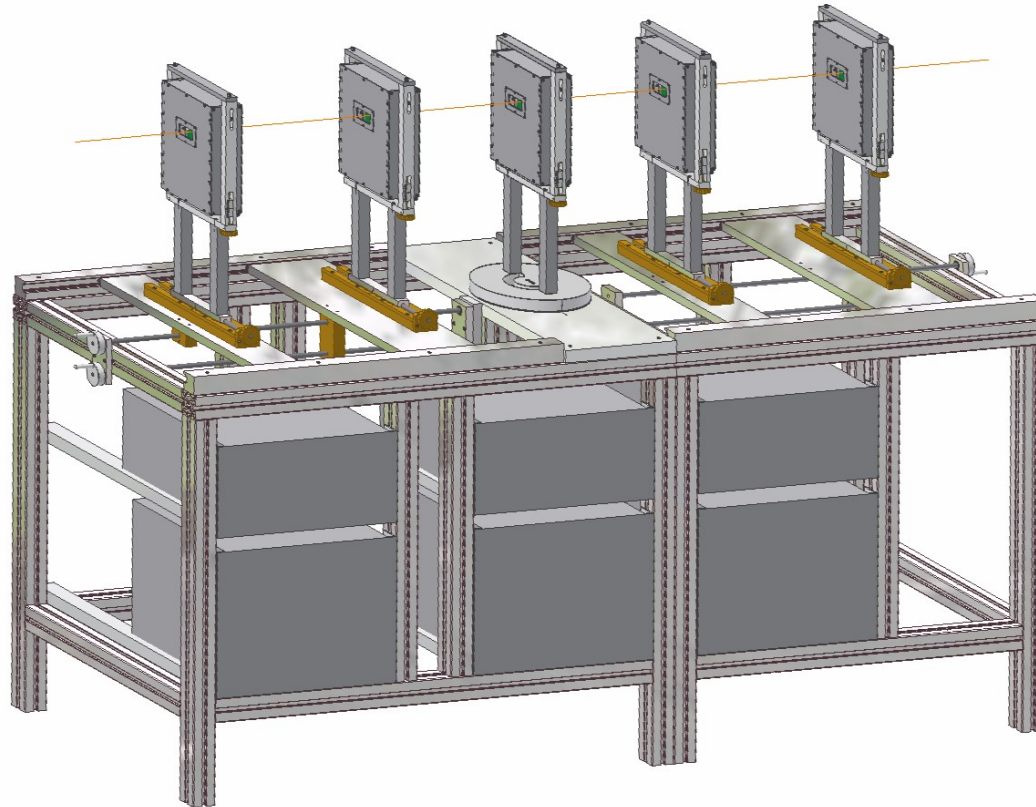
Bonn Test-Station

Data Analysis

- Supply Board voltages
- Front-End parameters
- Noise, pedestals, hit pattern
- Pulseheight-Spectrum
- Continuous updates from Bonn, Dresden & Mainz using common code repository

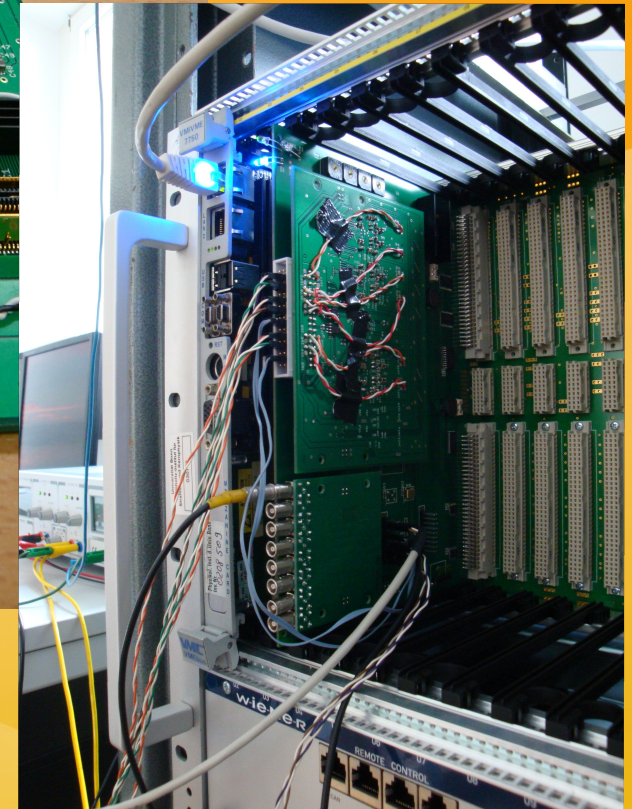
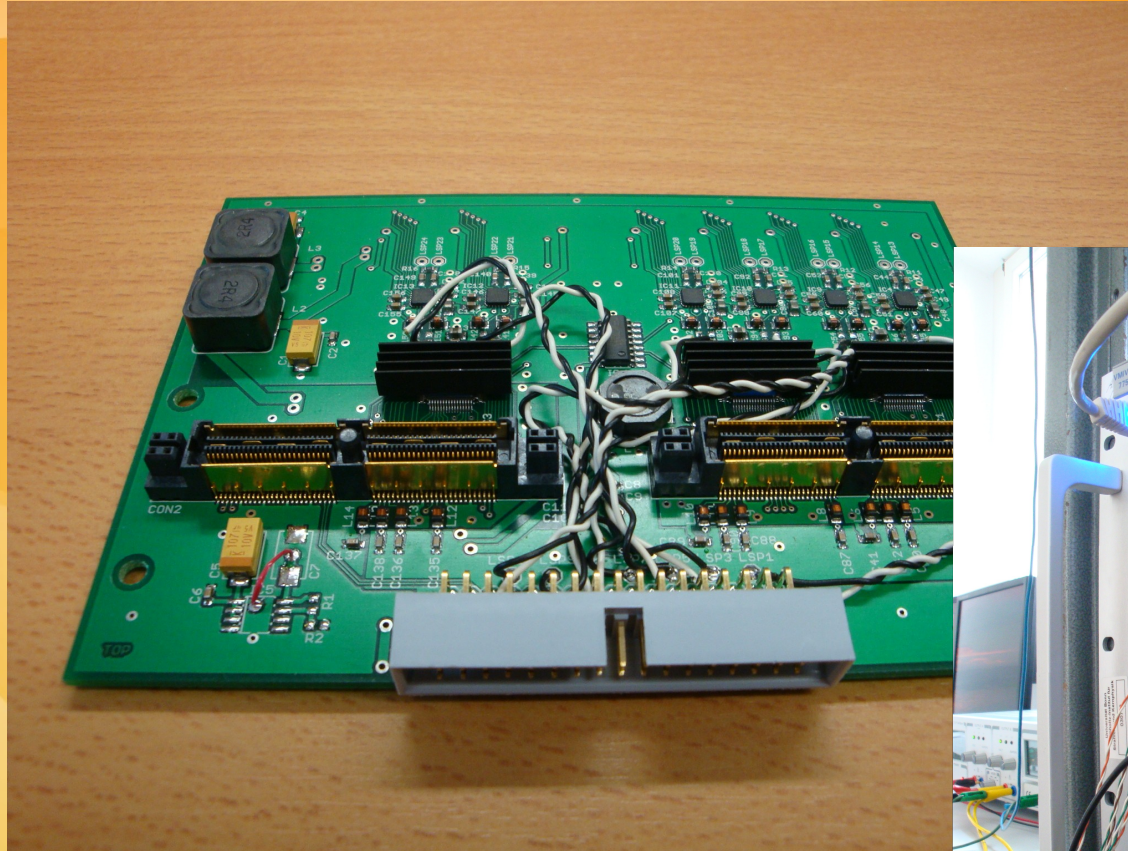


Tracking-Station



- Four sensor boxes for tracking
- x-y-z movement
- Measurement of multiple scattering for various materials
- Possible operation @ ELSA, COSY, GSI ...

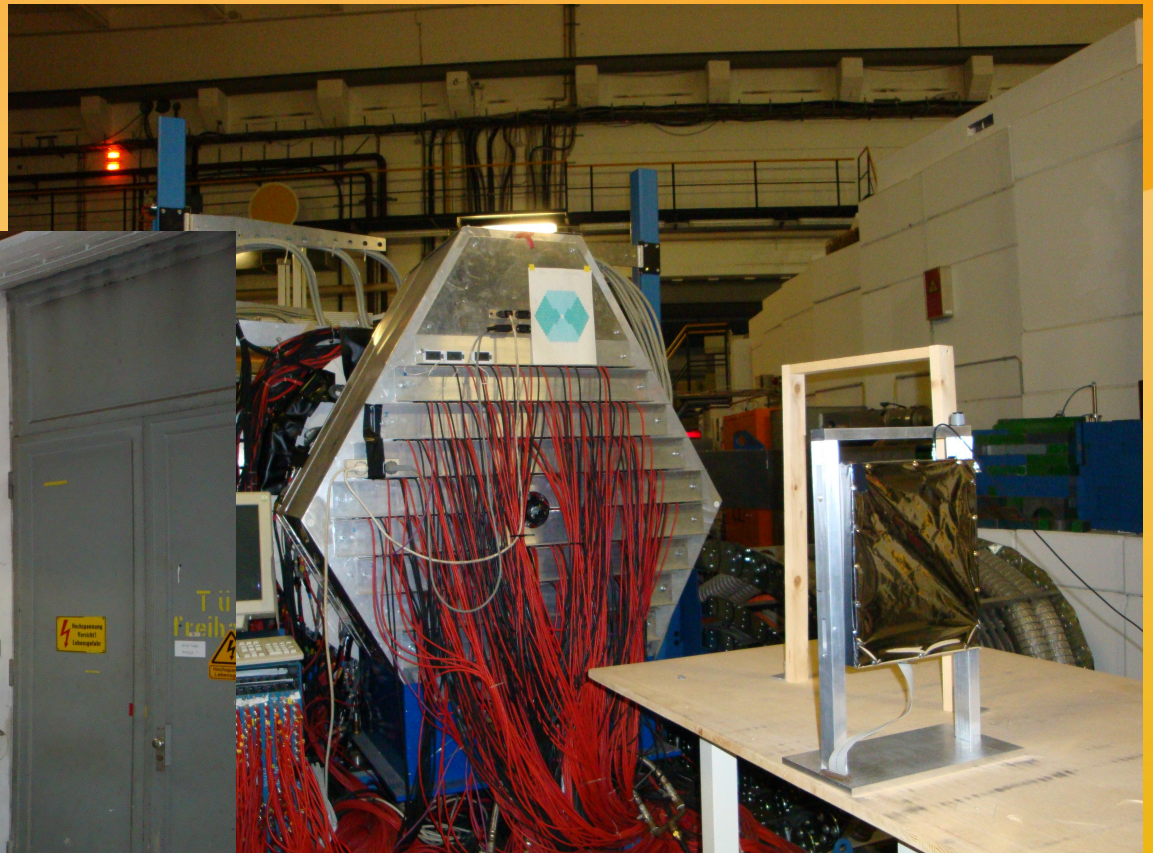
New Mezzanine ADC



- ADC output written to FIFOs in FPGA
- FPGA readout via VME
- Transfer from VME crate to PC via Ethernet
- Next: FPGA based pedestal subtraction, hitfinder, noise...

Sensor Test @ ELSA with photons

Setup behind Crystal Barrel



Sensor Test @ ELSA with photons

Goals:

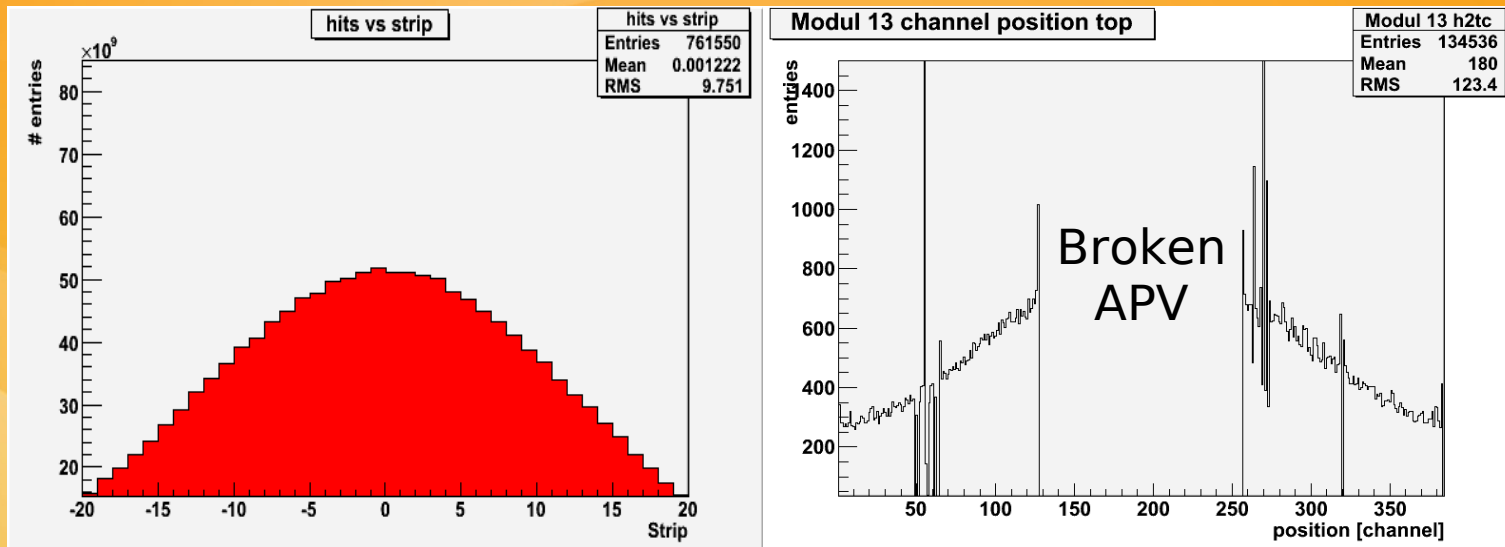
- First test with photons (up to 2.35GeV) from an accelerator
- Observation of the leakage current in the sensor (temperature - & photon flux dependency)
- Monitoring data outside the lab (Energy-loss, noise & channel positions with photons)

Results:

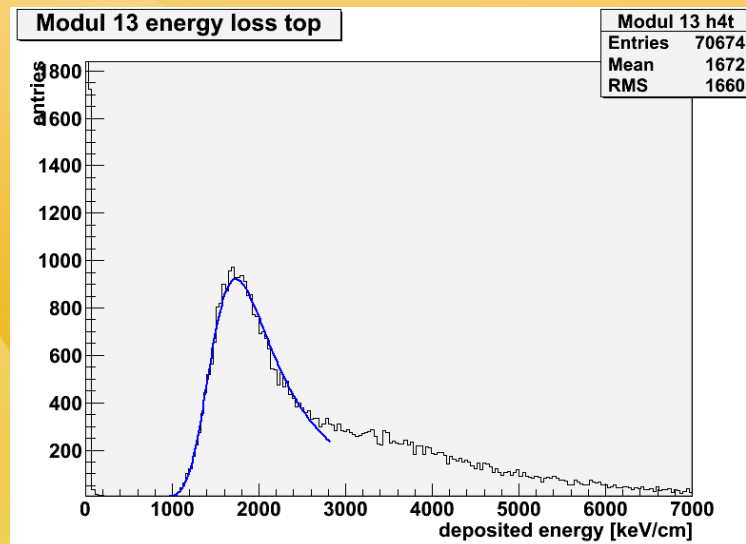
- Sensor survived & operated well
- Leakage current behaves as expected

Sensor Test @ ELSA with photons

Hits on the sensor: simulation vs. measurement



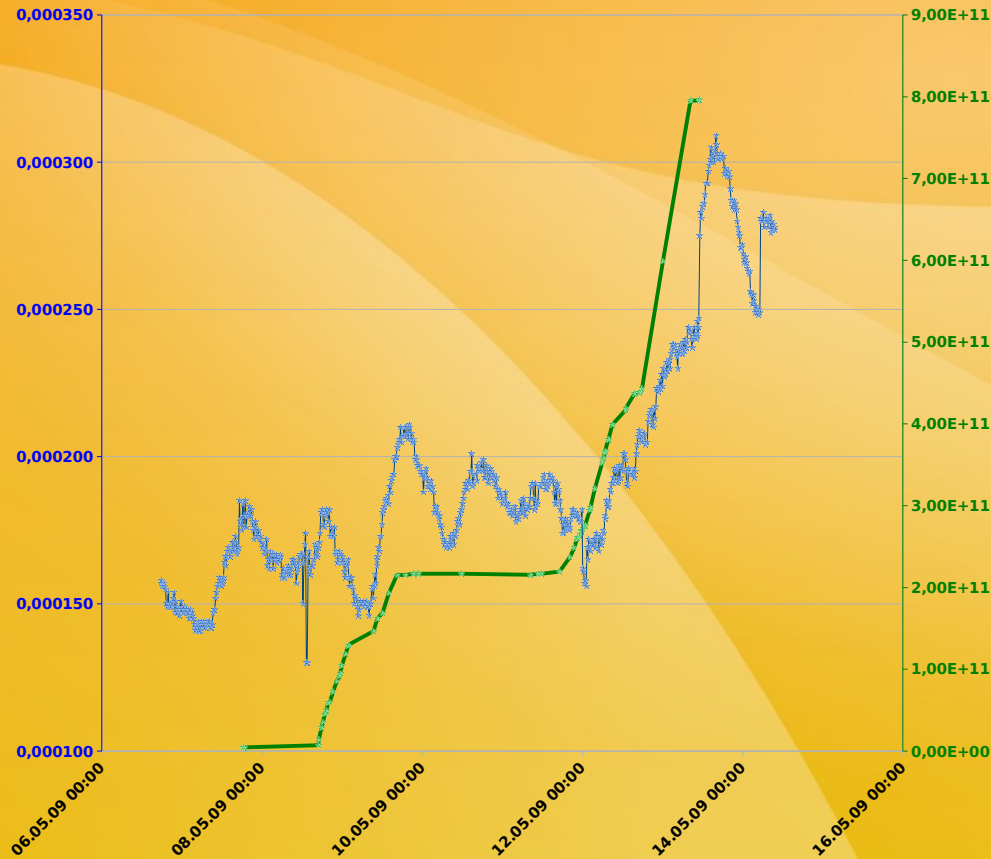
Measured energy loss:



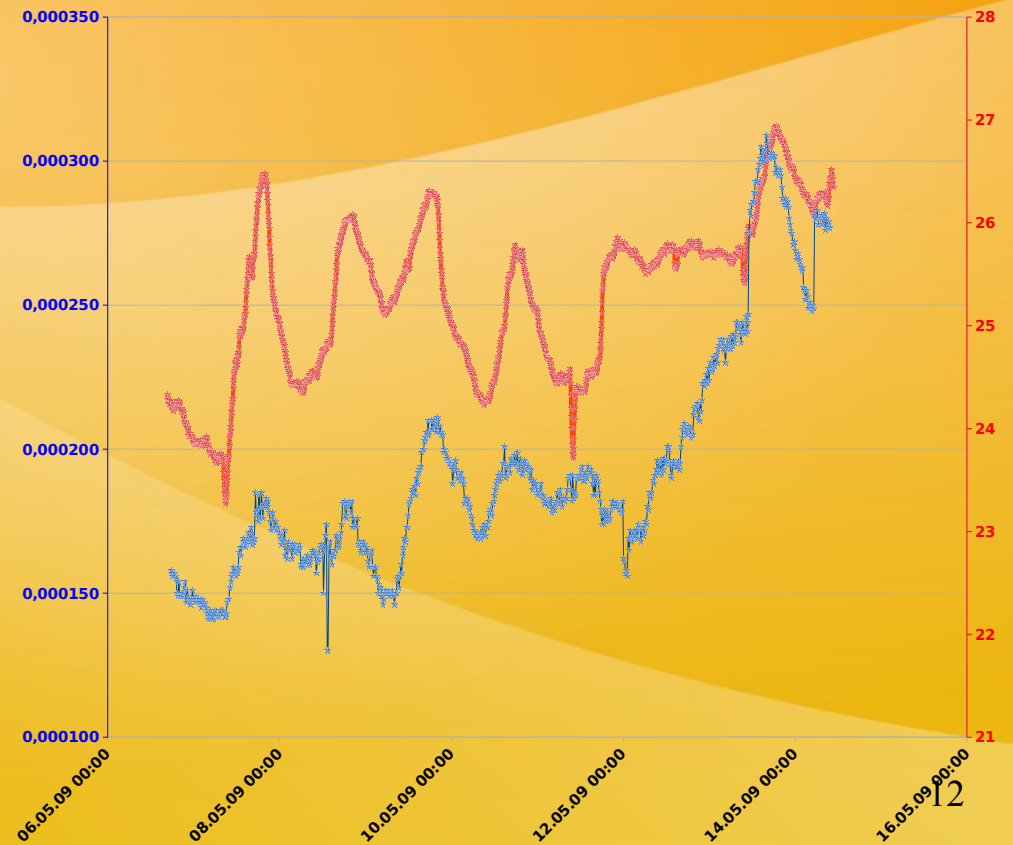
Sensor Test @ ELSA with photons

Leakage current and ...

...photon count



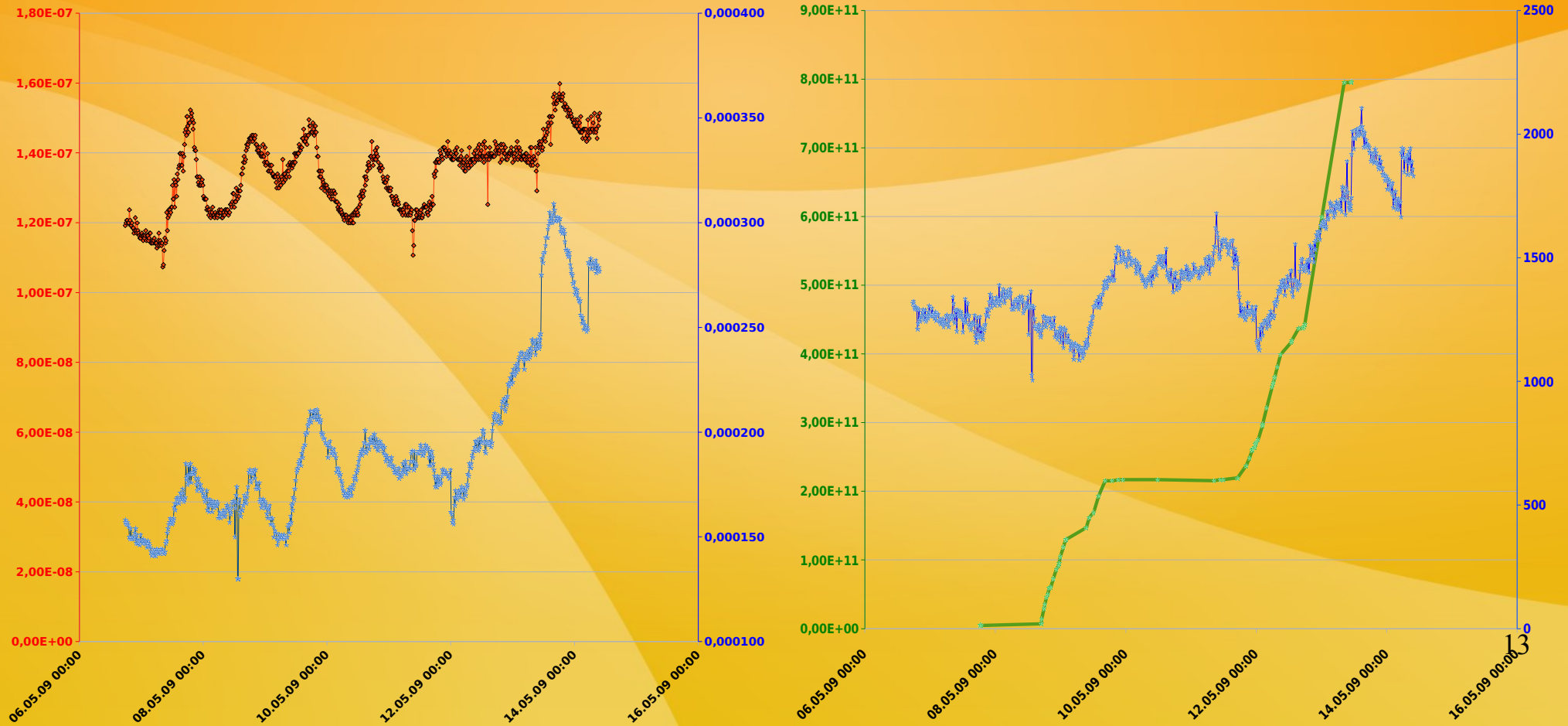
...temperature



Sensor Test @ ELSA with photons

Measured and predicted temperature
dependend part of leakage current

Normalized leakage current
and photon count



Summary / What's next?

Summary:

- Modular test setup for Si-strip sensors
- Full DAQ / preprocessing / reconstruction chain works

What's next?

- Implement double sided sensor boards in our test setup
- Construct a Tracking-Station & modify the DAQ for tracking