

# Micromegas TPC test in a high intensity beam

D. Attié, P. Colas, M. Dixit, M. Riallot, W. Wang

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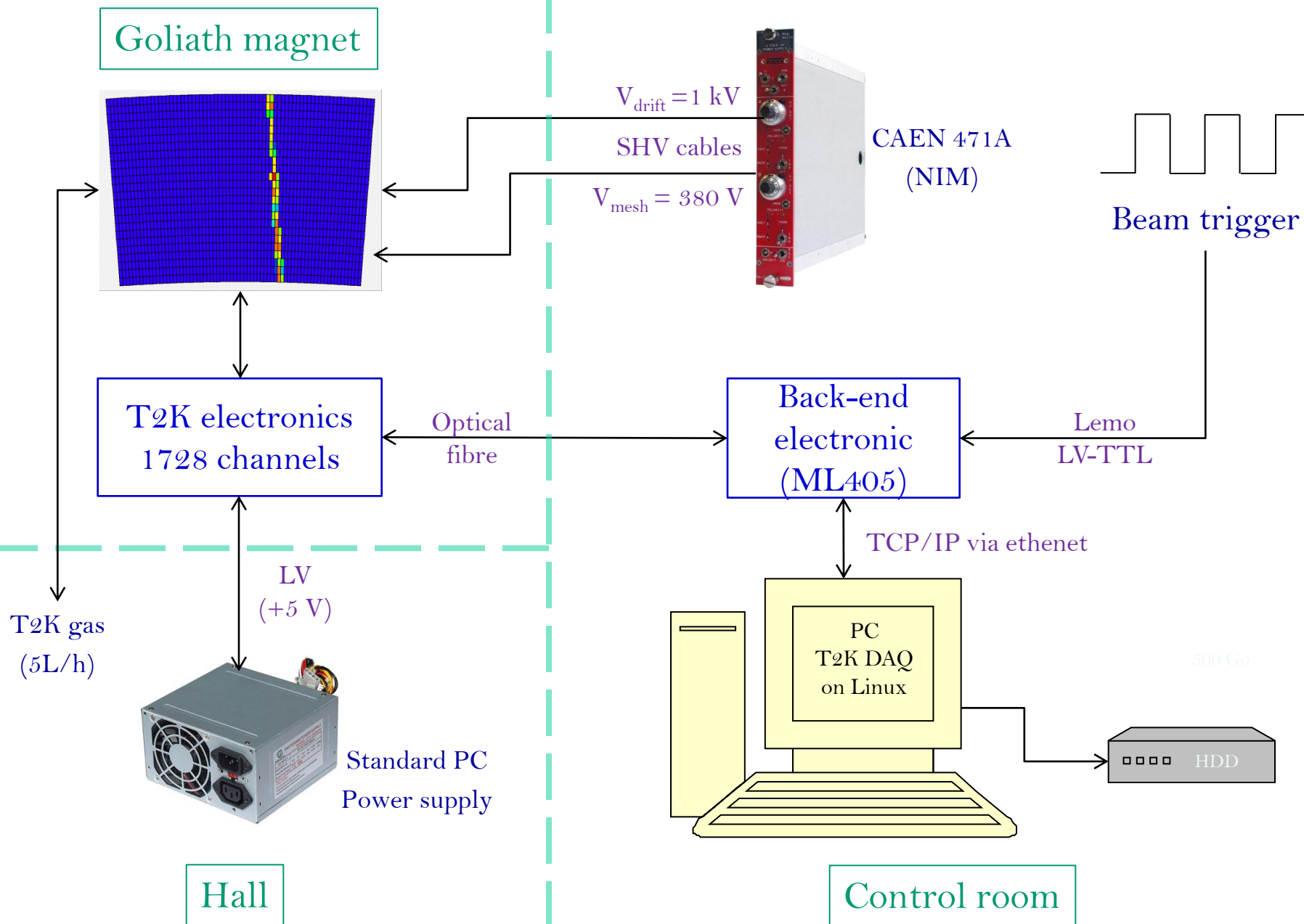
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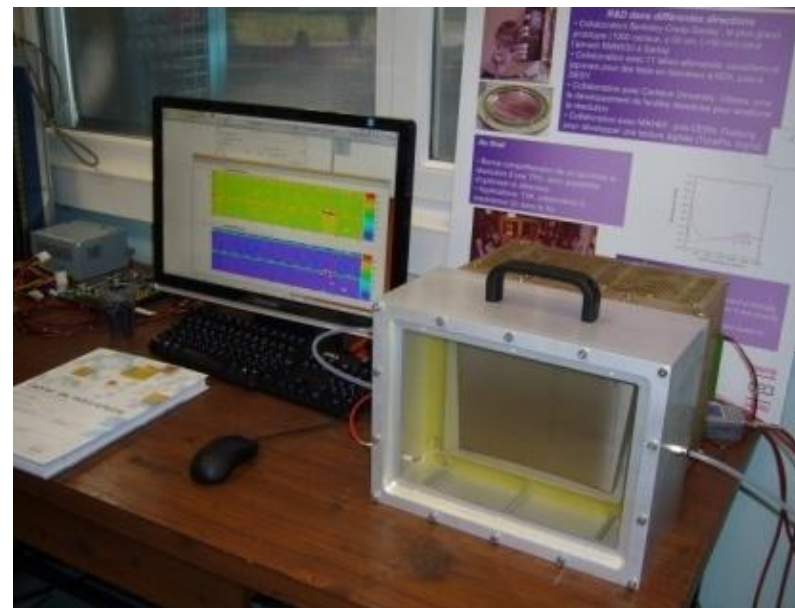
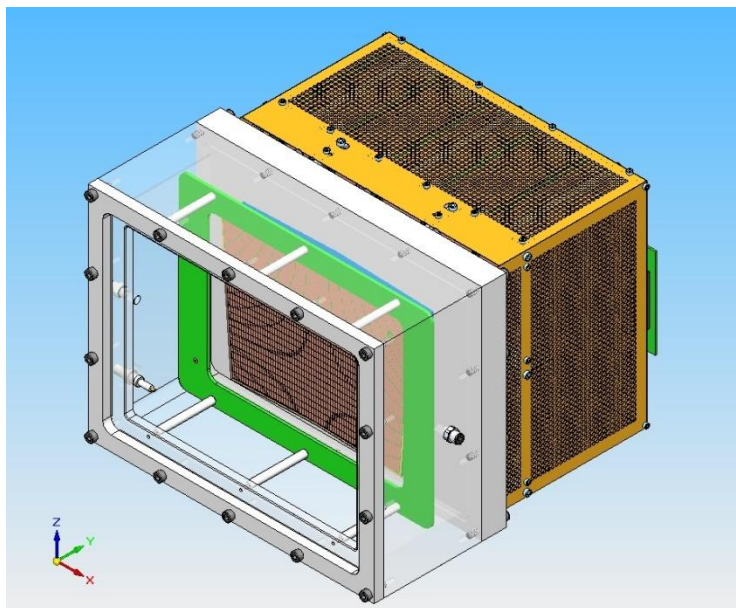
saclay

Miniweek, WG7, July 20, 2010

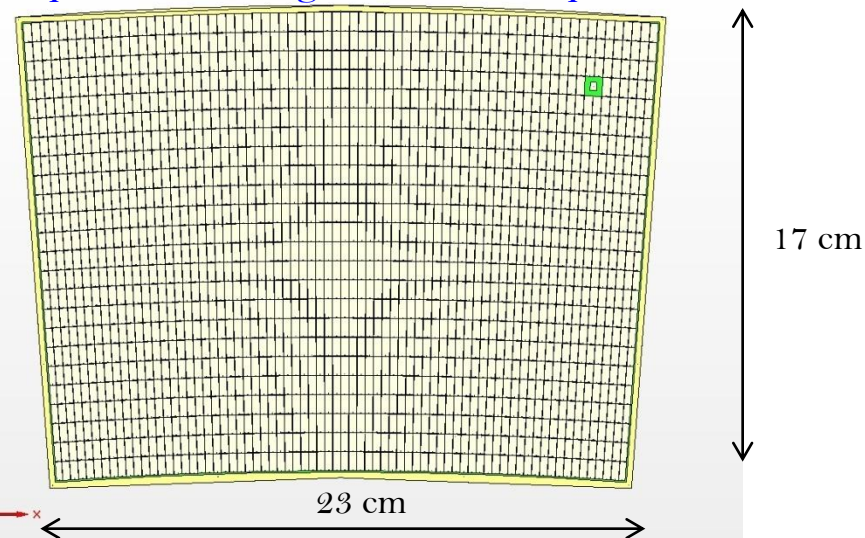


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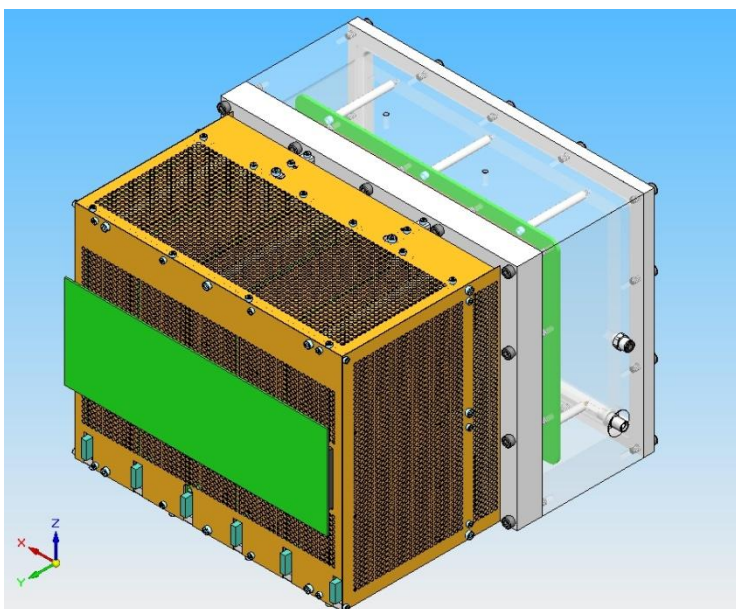




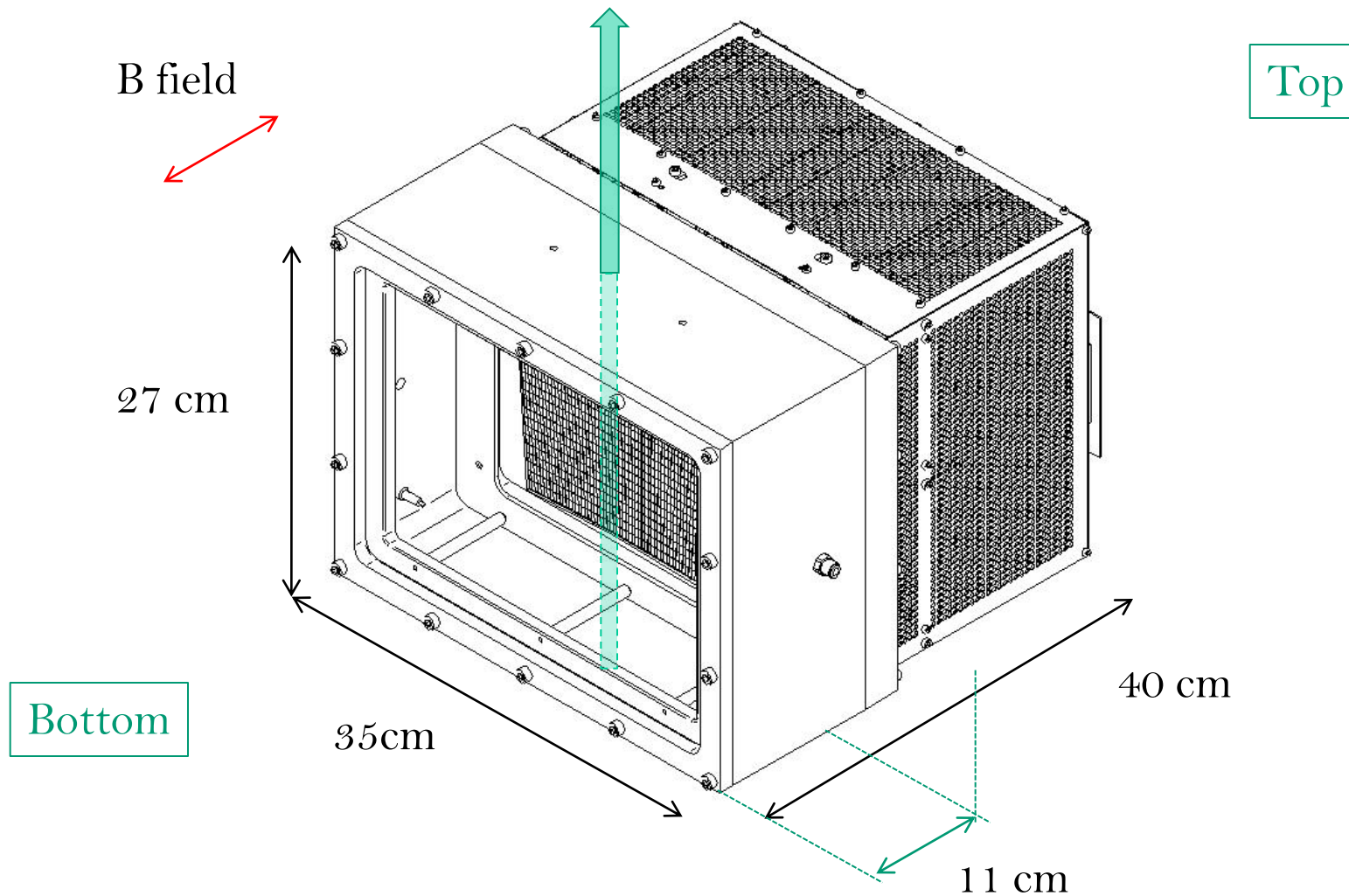
1726 pads Micromegas resistive Kapton bulk



24 rows x 72 columns;  $\langle \text{pad size} \rangle \sim 3.2 \times 7 \text{ mm}^2$

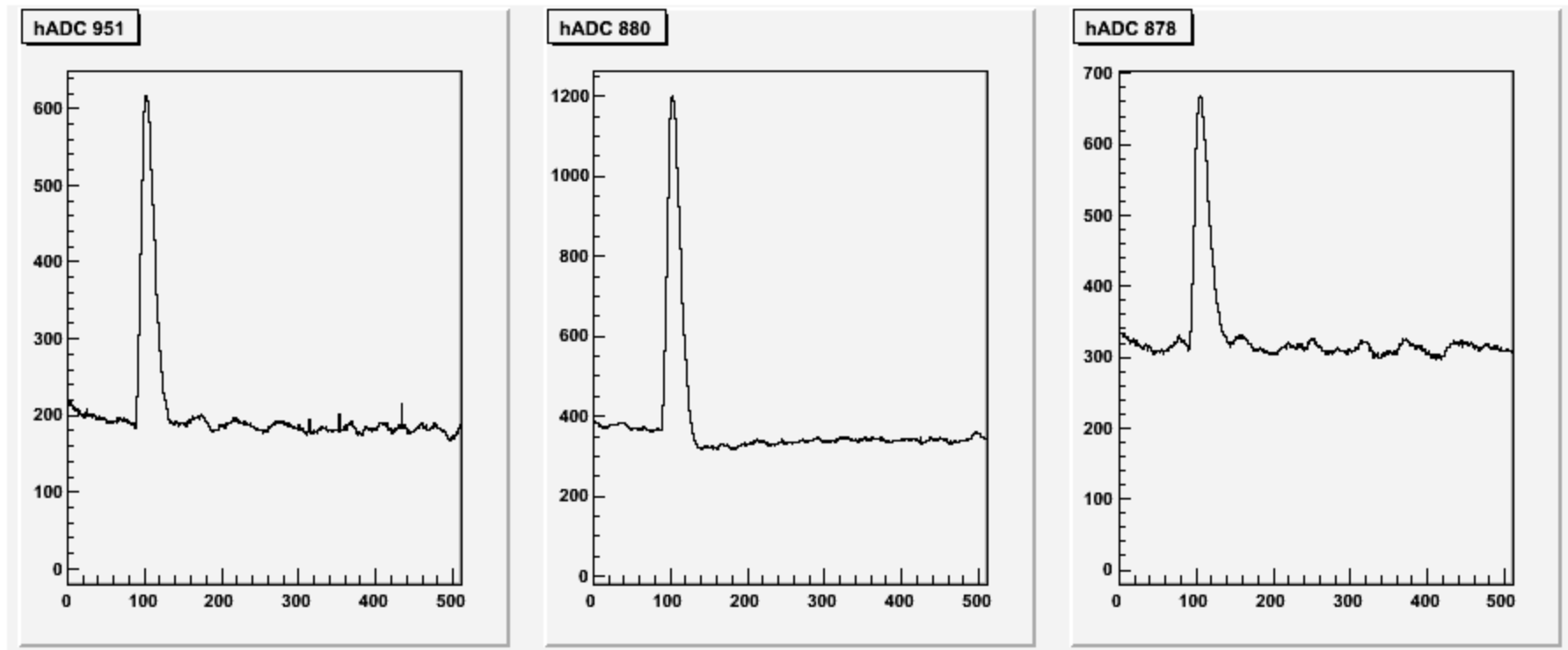


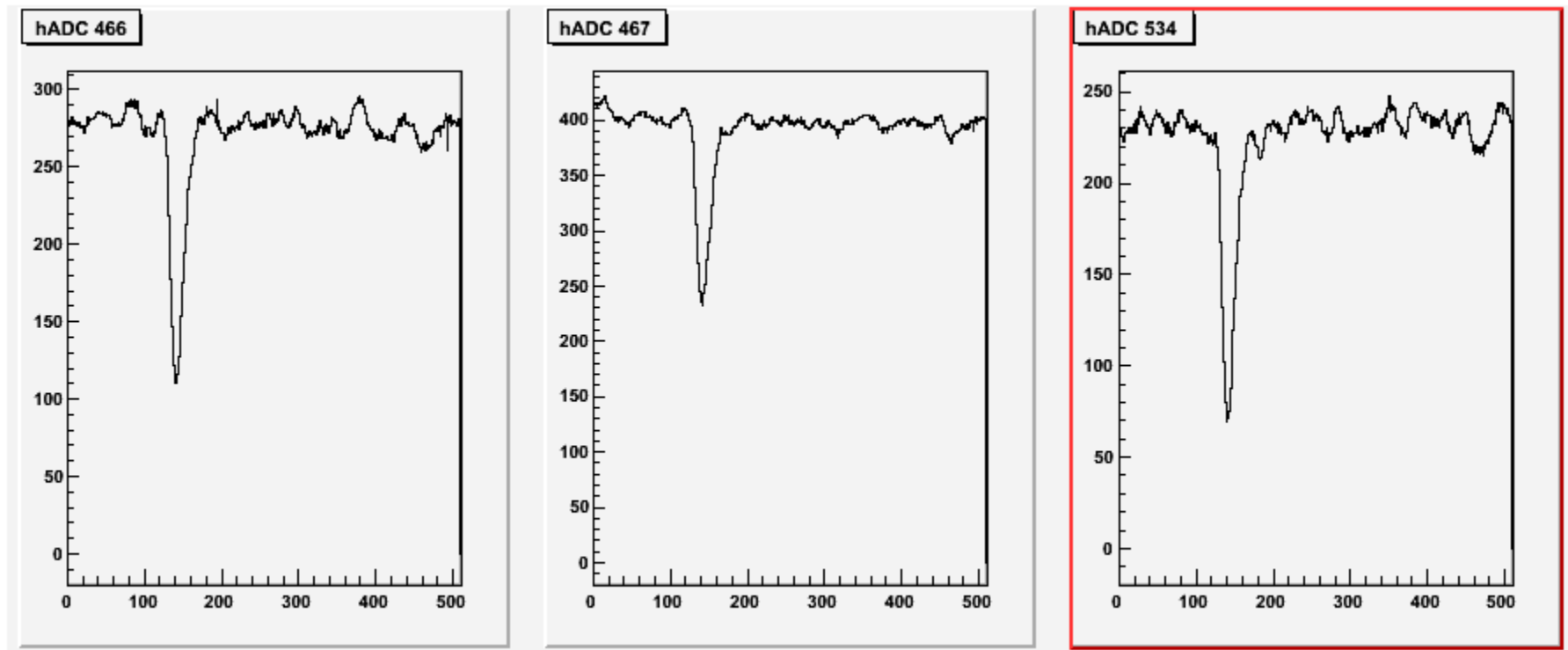
- Total weight: ~20 kg
- Radiation length: 40% ( $\approx$  1.8 cm of aluminium)



- First 3 days : installation. Problems with new DAQ (solved in the last days) -> take data with old DAQ and without zero suppression.
- Tracks are curved in the t-y plane, 3 hypotheses
  - Field distorted near the edges (true)
  - Ion feedback creates space charge (very unlikely)
  - Charging up of the window behind the cathode
- Last 4 days :
  - Tune the field to the gap so that drift velocity minimally affected
  - Replace the mylar window by a grounded conductive window.
- -> tracks are now straight

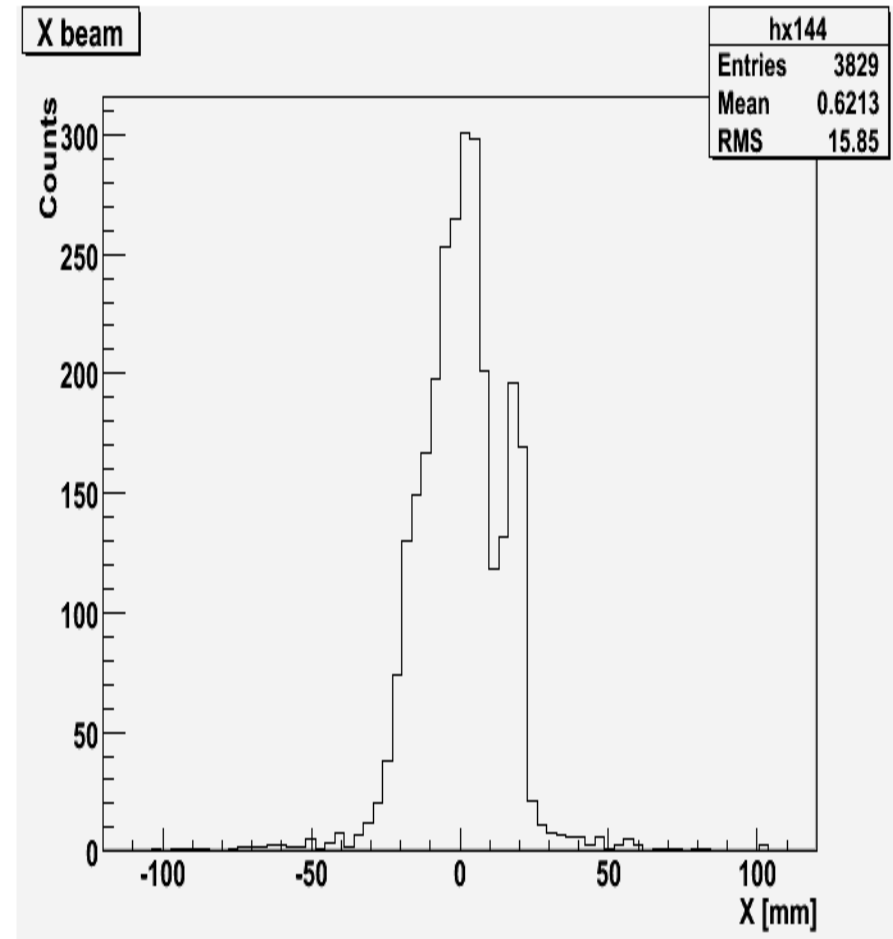
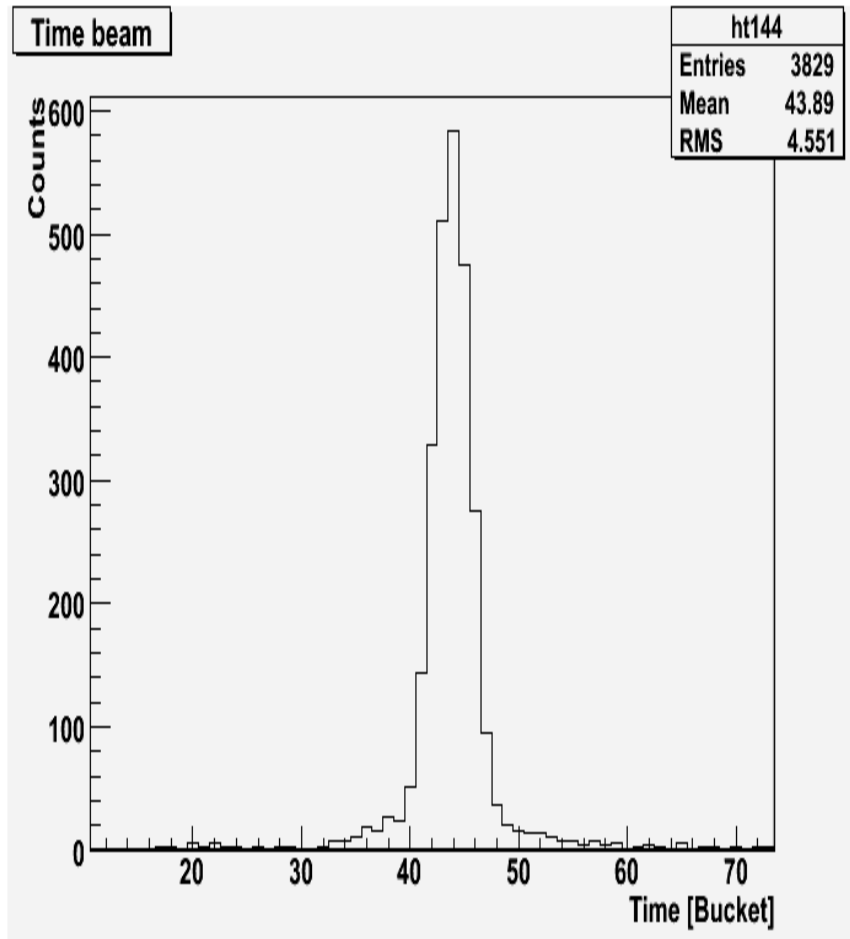
- Data were taken with muons mostly at 1 kHz and with hadrons at intensities up to 180 kHz (over a 5 cm x 1cm region) and 150 GeV energy.
- The drift length was 28.8 mm and the field 240 V/cm
- The gas was T2K
- The mesh voltage was 380 V, which corresponds to a gas gain of 2500
  
- The detector performed perfectly normally, as usual
- We also tested a new, faster and multimodule DAQ. We obtained read-out rates of 40 Hz.





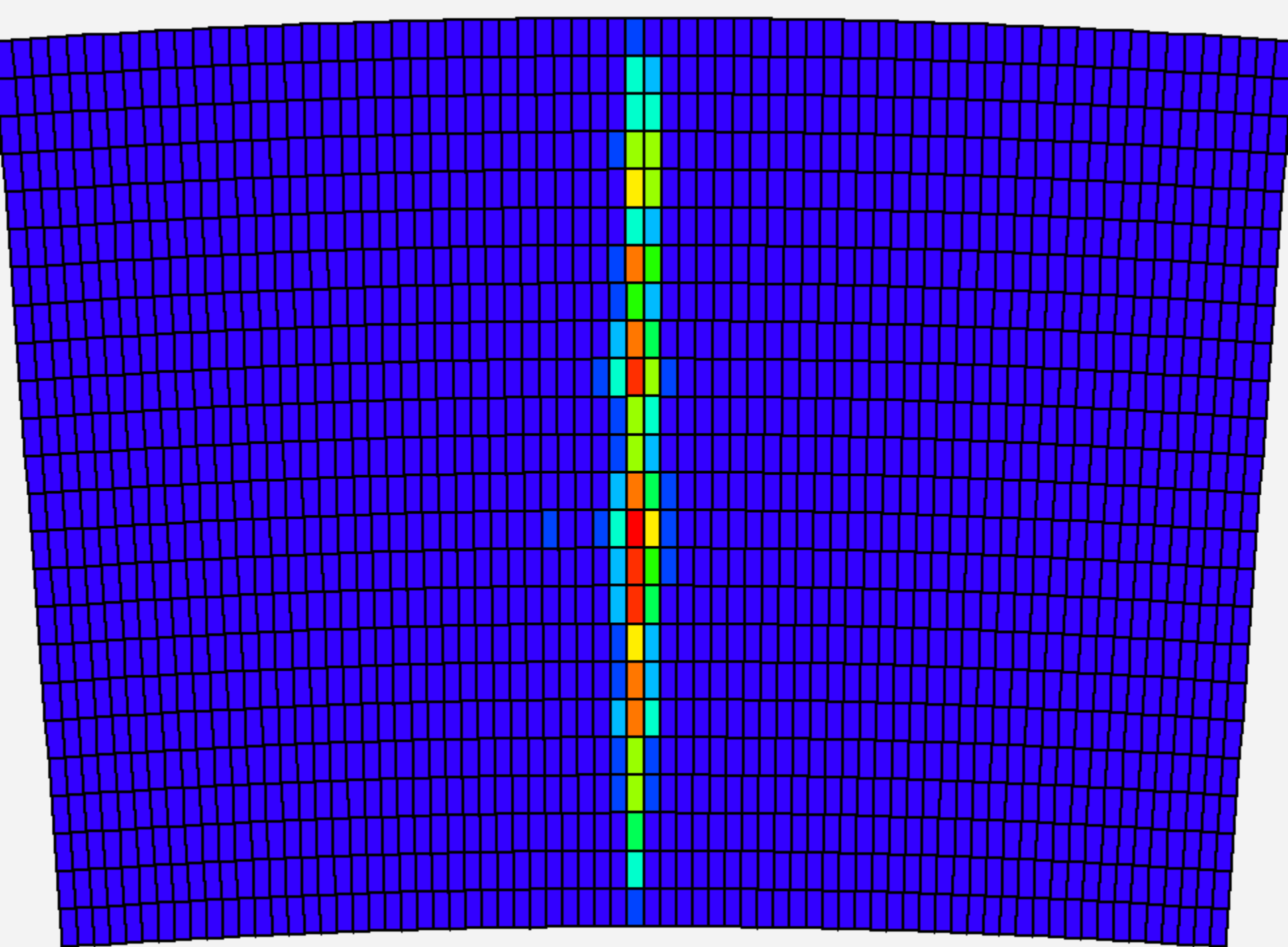
Known feature of the electronics : already observed in laser data in T2K and in LC-TPC at DESY

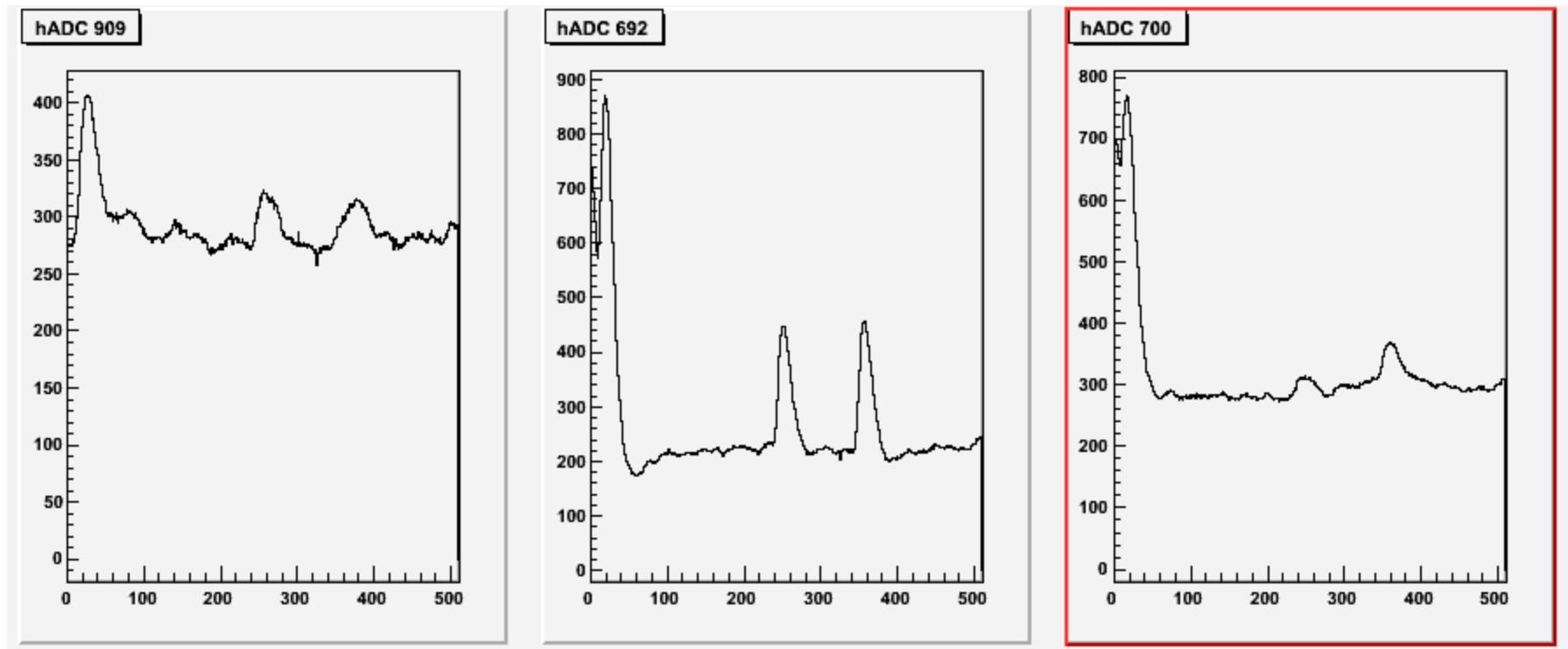




20 mm

Drift gap 28.8 mm





One given pad can see several consecutive tracks separated by less than a microsecond.