
Front End Electronics – Preliminary system performance

Alice TPC Meeting – Cagliari 16-17 May 2004

Roberto Campagnolo

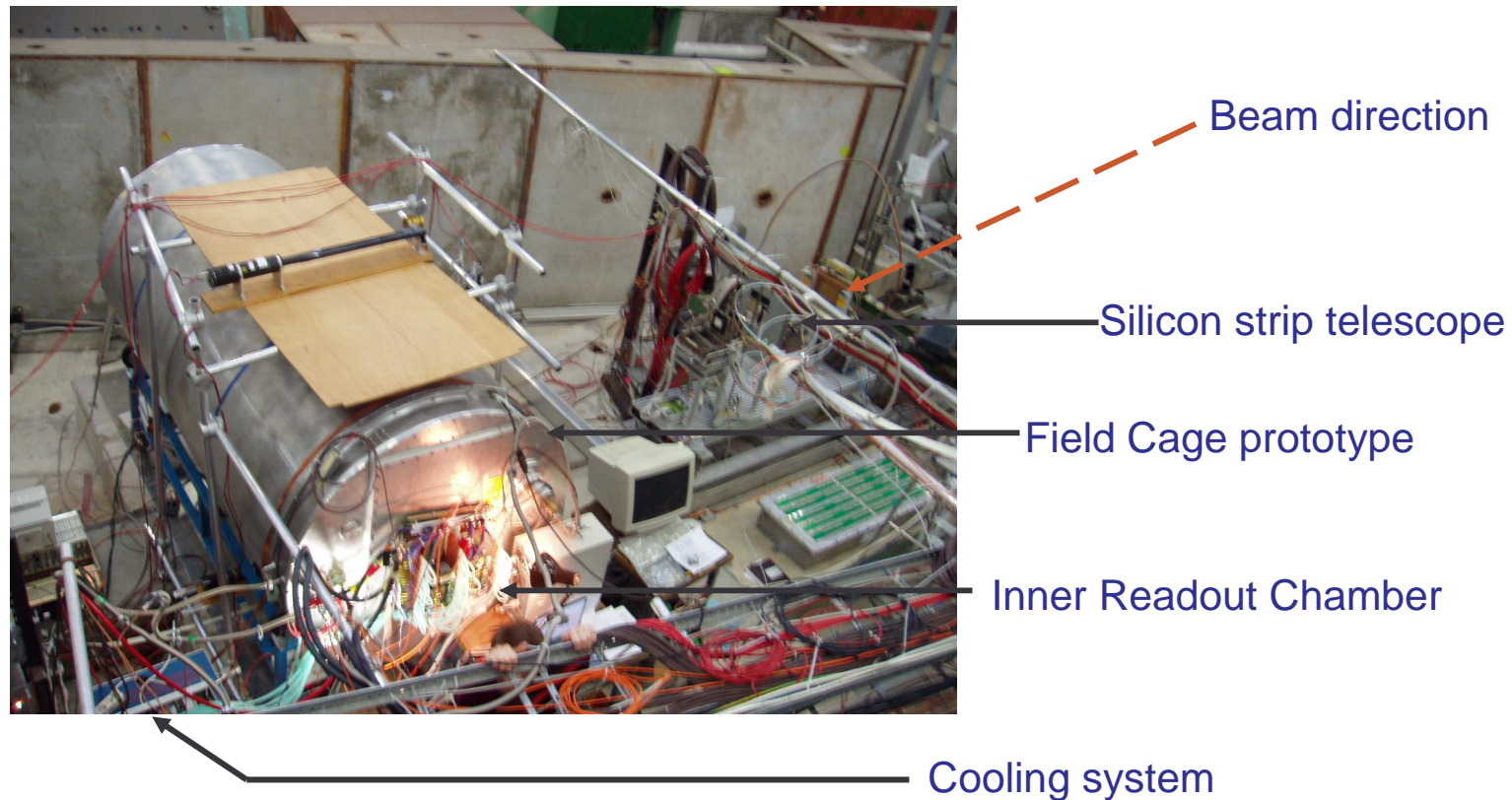
OUTLINE :

- *Installation of FEE connected to IROC in Field Cage prototype in T10*
- *Noise level and baselines' distribution*
- *^{55}Fe and ^{90}Sr ionization pulses*
- *Conclusions*

Setup at Cern T10 experimental area

IROC in Field cage prototype to be readout with:
43 FECs (5500 channels , ~ 1 % of Alice TPC)
connected to 2 RCUs by
4 branches of ALTRO readout backplanes.

2 DCS boards interfaced to the RCUs and connected to the TTC, 2 SIUs for the DDLINK
Power supply distributed via bus-bar connected to a Wiener500 supply through 40 m. cables



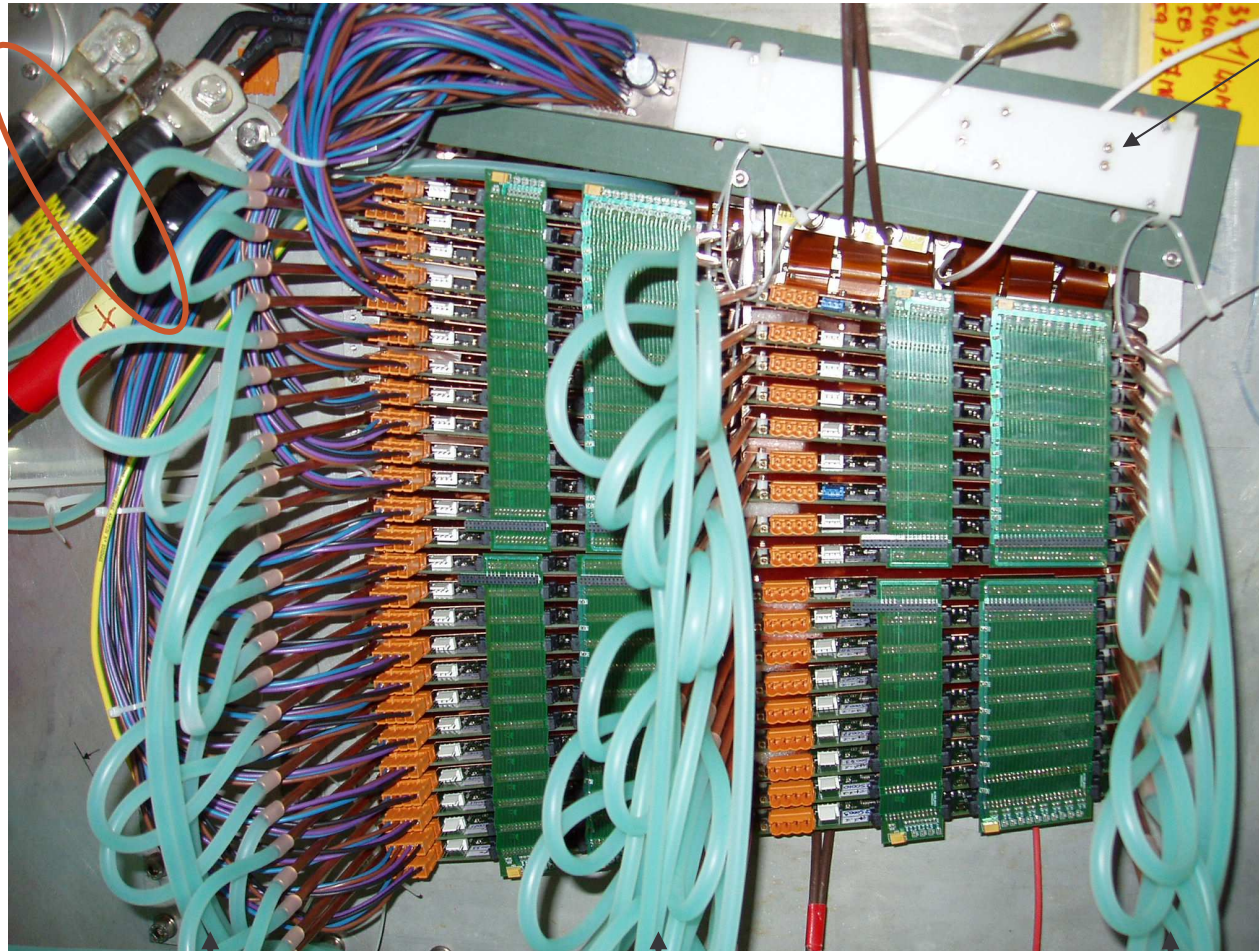
Installation of the FECs and readout backplanes

150 mm² power supply cables

Power supply bus bar

25 FECs

18 FECs

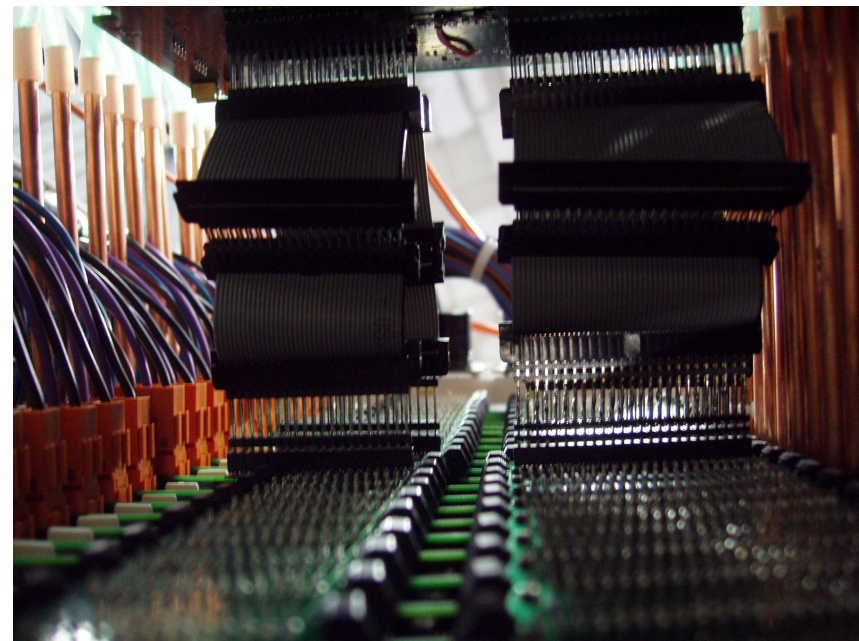


Connections of the cooling pipes to the cooling system

Grounding and connection to the RCU via additional cables

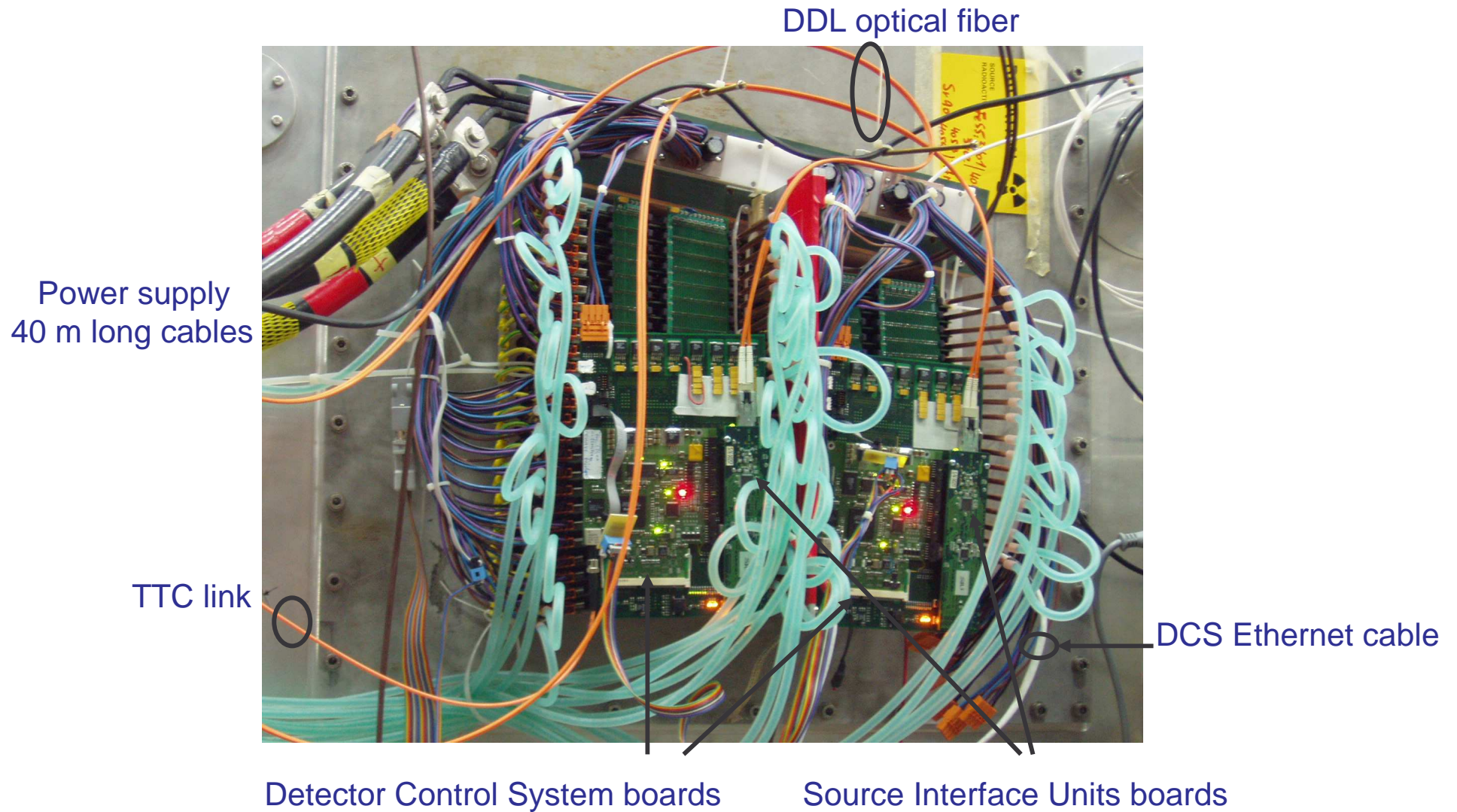


Readout Control Unit



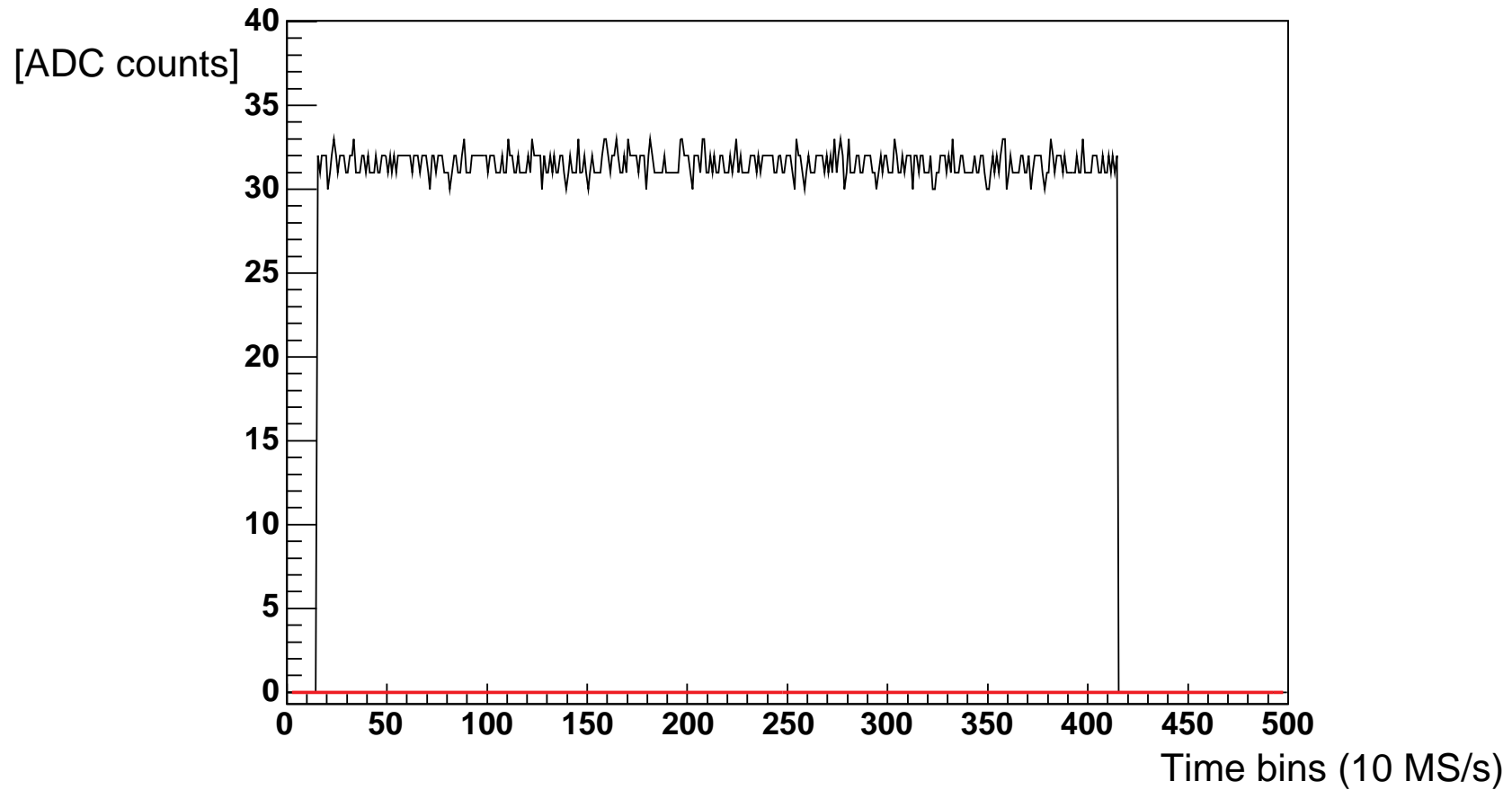
Misalignment of the 2 branches due to the use of inappropriate mechanical support

Final system overview



Noise level for 1 channel

Event: 16 Row=53 Pad=78 RMS=23.395742 Channel=727 maxADC =33

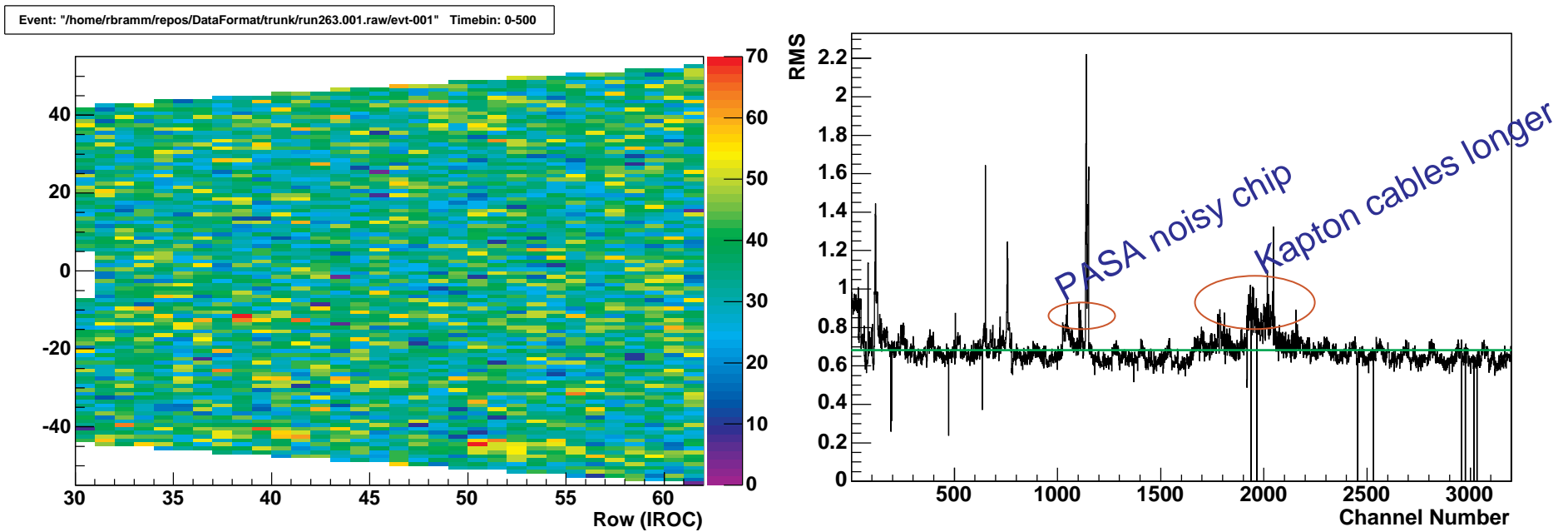


Noise level of standalone (without Cooling Plates): 0.52 ADC counts rms

After connection to the detector pad plane : 0.68 ADC counts rms (1 ADC Count $\approx 1040e^-$)

Pedestals and noise level for the 25 FECs crate

3200 FEE channels

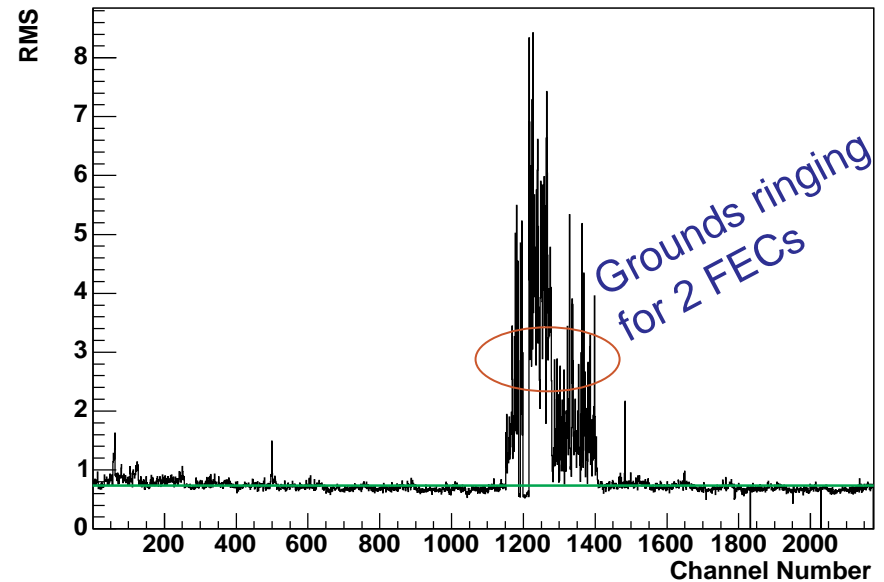
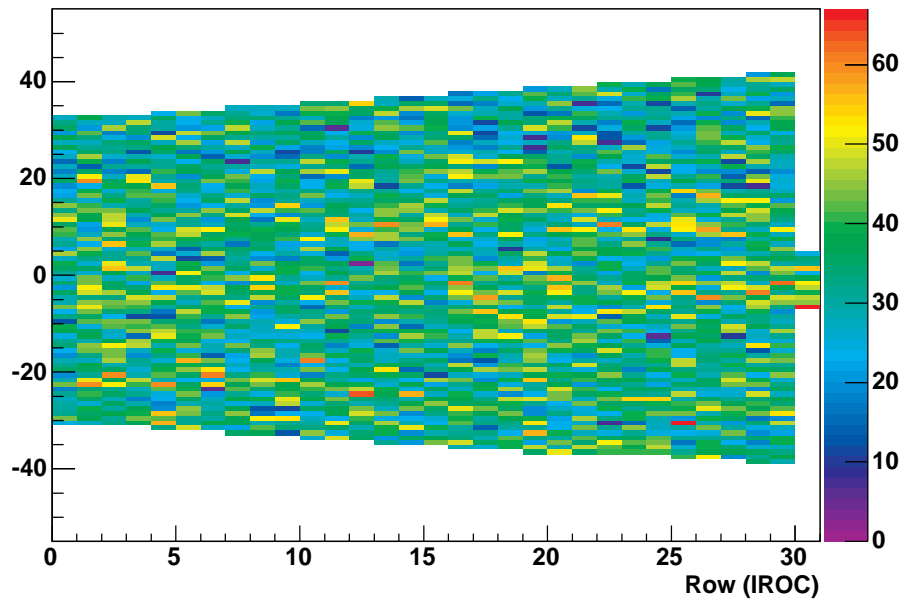


Noise average level: 0.68 ADC counts r.m.s. ($\sim 700 e^-$)

Pedestals and noise level for the 18 FECs crate

17 FECs readout = ~ 2100 FEE channels

Event: "/home/rbramm/repos/DataFormat/trunk/run184.001.raw/evt-001" Timebin: 0-500

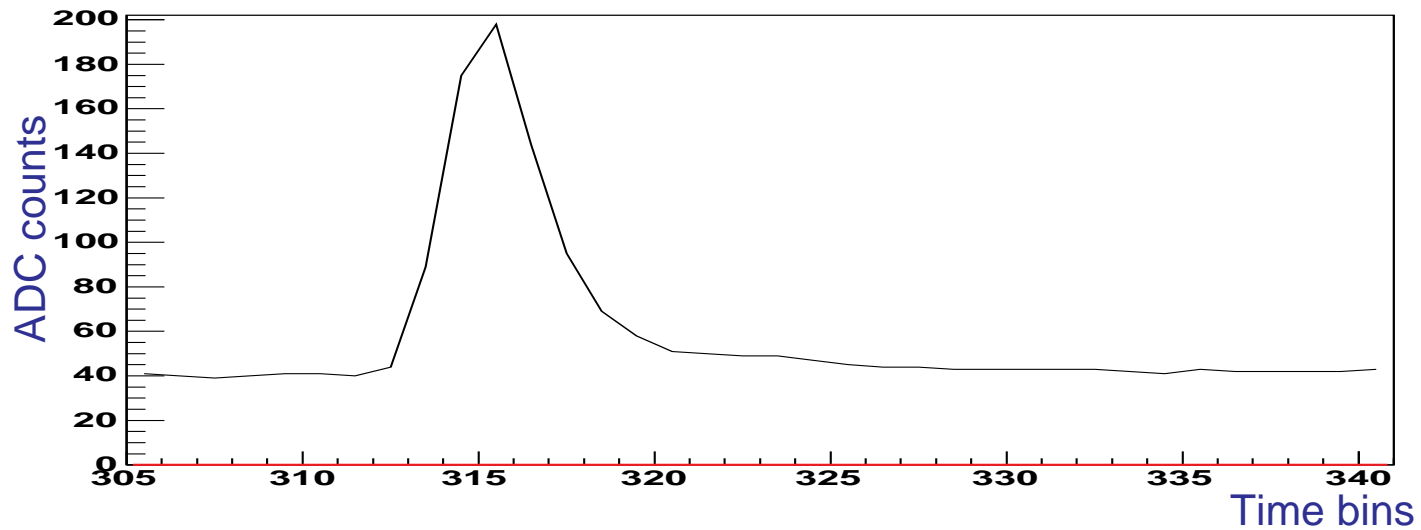
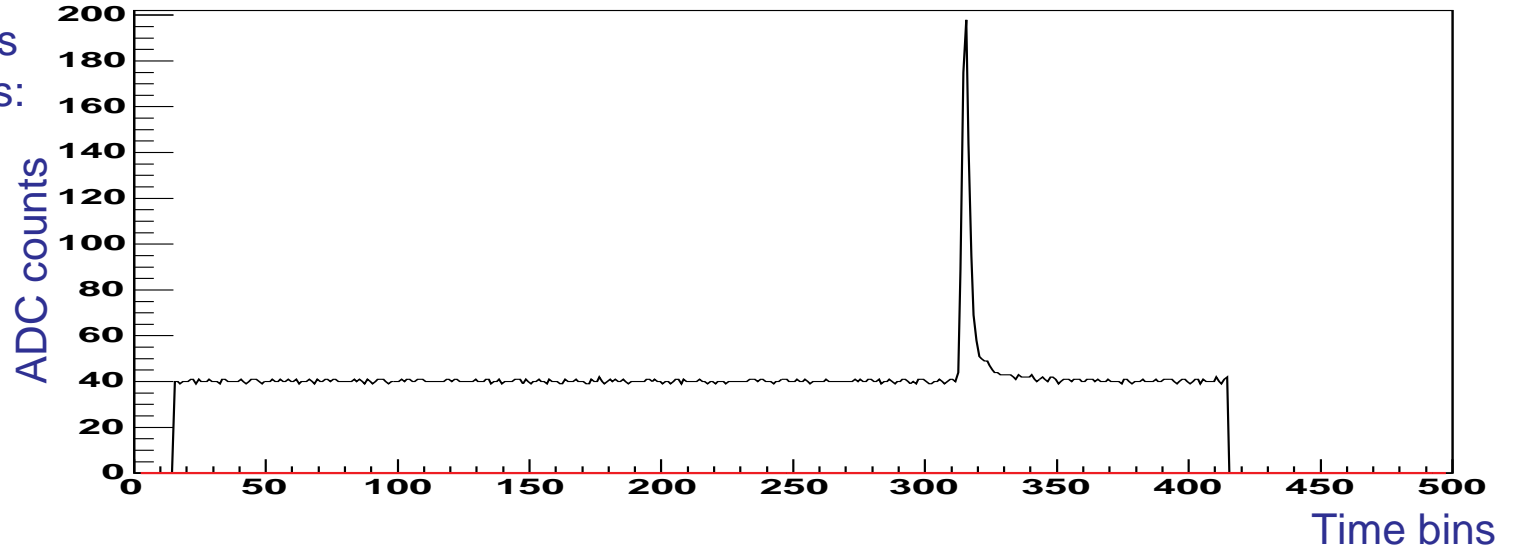


Noise average level (excluding the ringing cards): 0.73 ADC counts r.m.s. (~ 760 e⁻)
-Increase in respect of the other crate due to poor grounding connections-

^{90}Sr and ^{55}Fe ionization pulse

Event: 16 Row=58 Pad=57 RMS=50.235218 Channel=1515 maxADC =198

Examples of pulses
sampled at 10 MS/s:



Conclusions

- 5400 FEE channels have been successfully integrated with other detector components
- The operation underlined the importance of some electrical and mechanical aspects
- The average level of noise is below 750 e⁻ r.m.s.
- The system is ready for the scheduled test beam activities

End of presentation
