

Addendum to Expressline II

Database status

The new Frontend Adaptor

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- Some additions to the Expressline II measurements
(Comments to the last talk)
- Some comments to the database
- Measurements with the new Frontend
 - Comparison noise
 - Calibration pulse height
 - Backplane pulse

The background of the slide is a faded, repeating pattern of detector modules, likely calorimeters, arranged in a grid. Each module is rectangular with a central square area and various components on top.

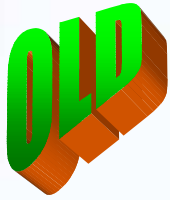
Some Additions to the Exressline II Measurements

9 Modules

- TEC Ring 6
- Equipped with ceramic hybrids
- Assembled on the gantry in Bruxelles
- Bonded in Aachen (AC I)
- Tests done by Aachen I (*Jan Olzem, Katja Klein*)
 - Using ARC & ARC LED System
- *All nine in IV tests under controlled conditions*
- *5 of 9 modules in cooling cycles*

The background of the slide is a faded, repeating pattern of CMS calorimeter modules, which are large, rectangular, multi-layered detector components.

Some Comments on the Database



Writing XML Files



No problem in principle...

- Pedestal, noise, raw noise, calibration amplitude etc.
- Definition of some tags had/have to be clarified:
 - val
 - tool_id
- Reordering of XML file structure requires minor changes

...but still some work needed,



New ARCS Release next week



Writing XML files

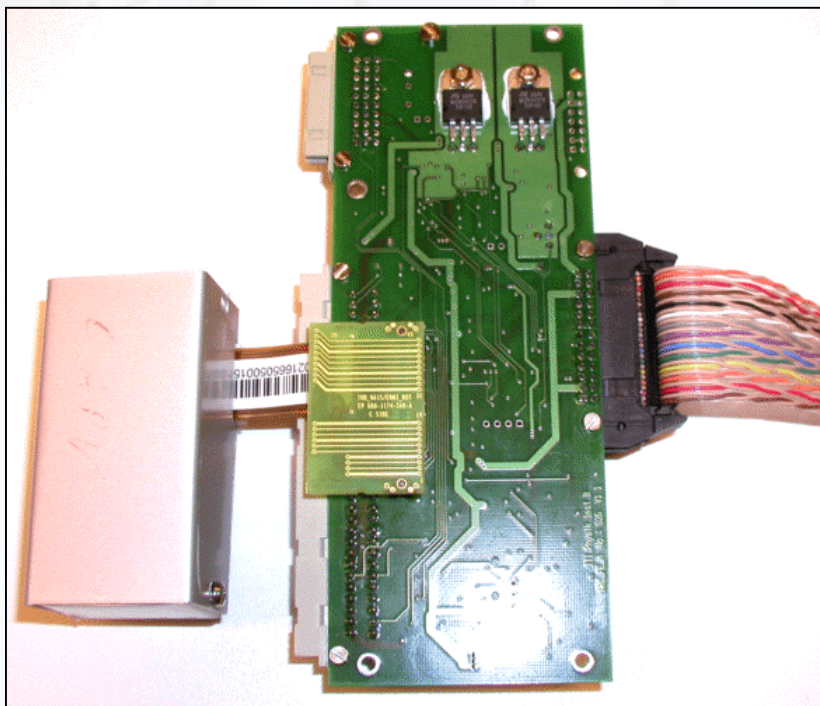


- Up to now we assumed a fixed database definition where only some small things had to be clarified.
 - ➔ *based our implementation on that fact*
 - XML files were created during the testrun (not afterwards)*
- Latest discussions about database definition (29/01/03) showed that many things are not clear and will become fixed by experience only
- Changes in DB and XML file structure are very probable
- Need possibility to extract data from older local data files to convert in the latest DB compatible XML file version
 - ➔ *Requires a much more flexible concept*
 - ➔ *We will try to profit from Valery Zhukovs XML parser which has that flexibility*
 - ➔ **Will cost more time to finalize the new ARCS version need two weeks in optimistic scenario**

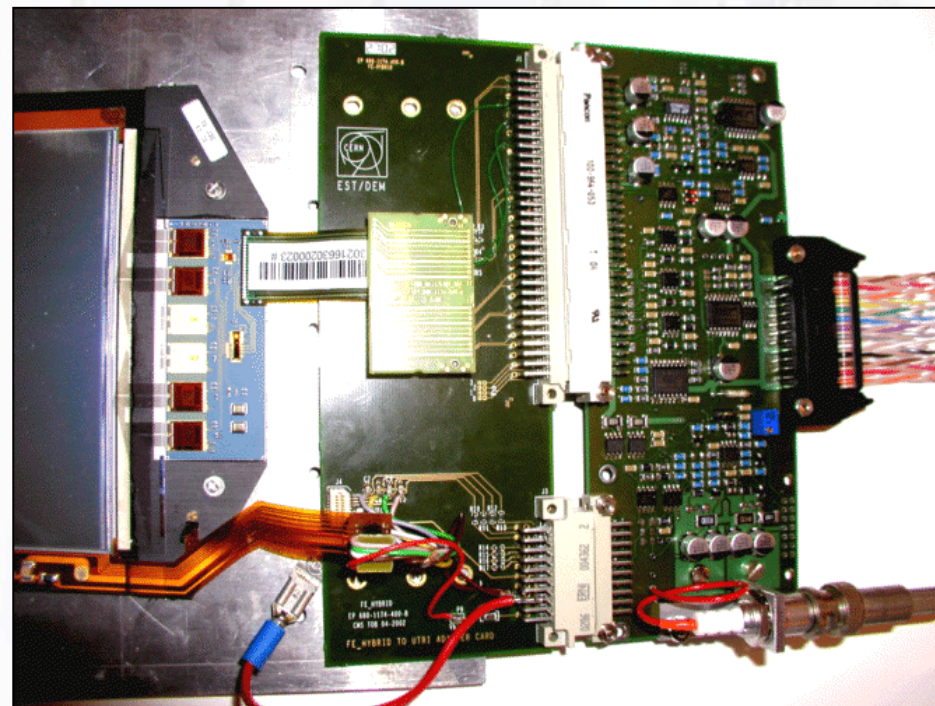
The background of the slide is a faded, repeating pattern of several ARC Frontend modules. These are rectangular printed circuit boards with various electronic components, including integrated circuits and connectors, mounted on them.

Measurements with the new ARC Frontend

- Status:
 - 25 PCBs assembled
 - All will be tested until end of this week



Setup for hybrid tests using the ERNI connector at the backside of the frontend

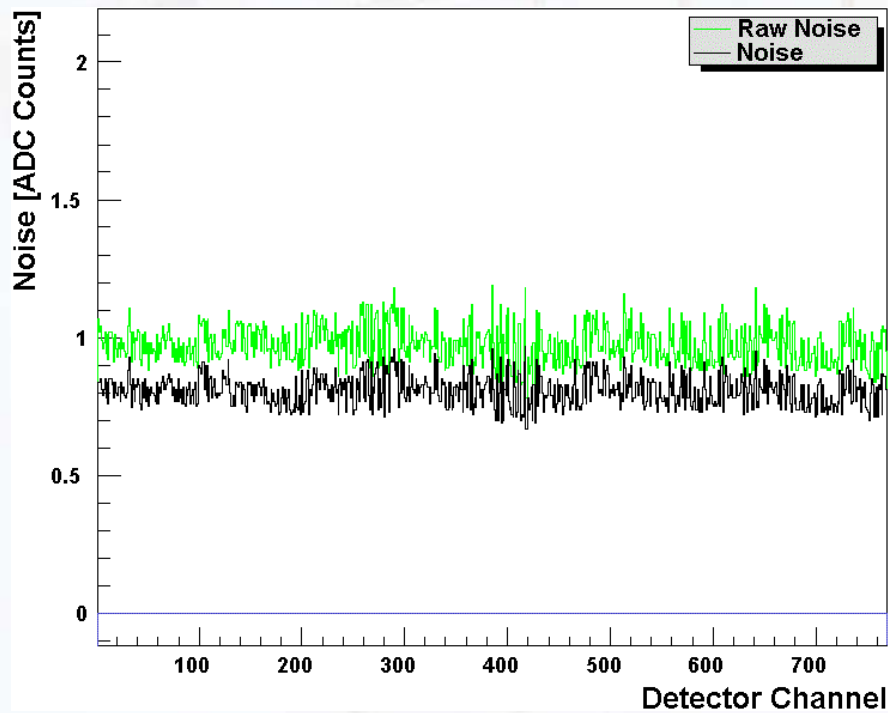


Setup for Module Tests

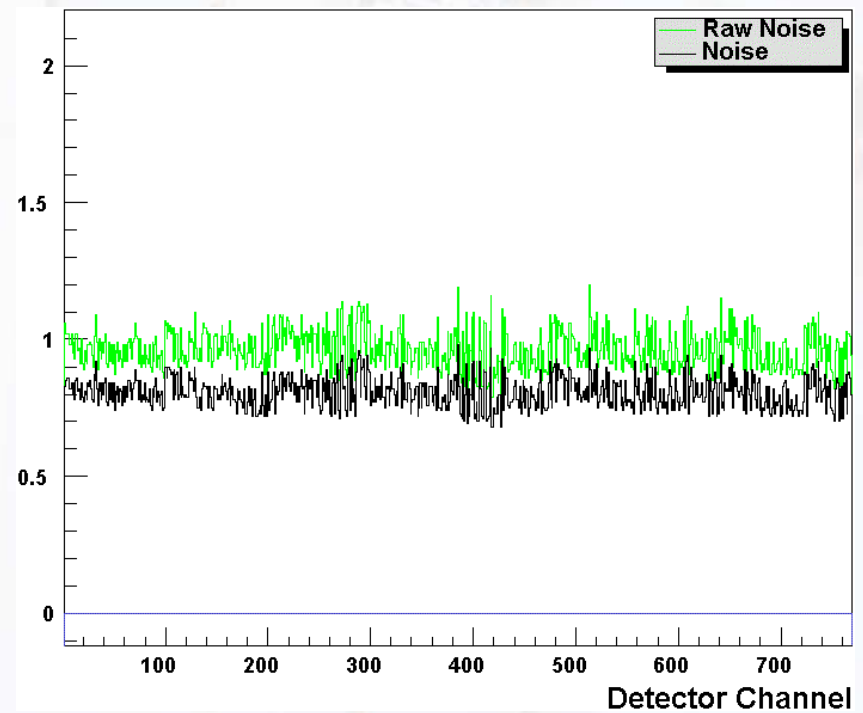
The background of the slide is a faded, repeating pattern of particle detector modules, likely silicon strip detectors, arranged in a grid. Each module is rectangular with a central strip and various electronic components at the top.

Comparison in Hybrid Tests

- Noise nearly identical



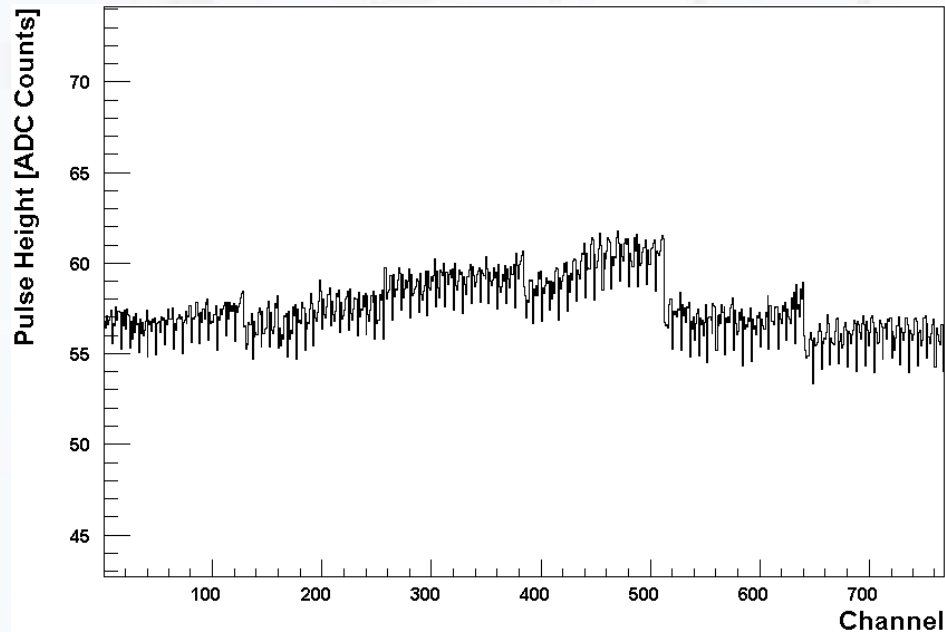
Old Frontend



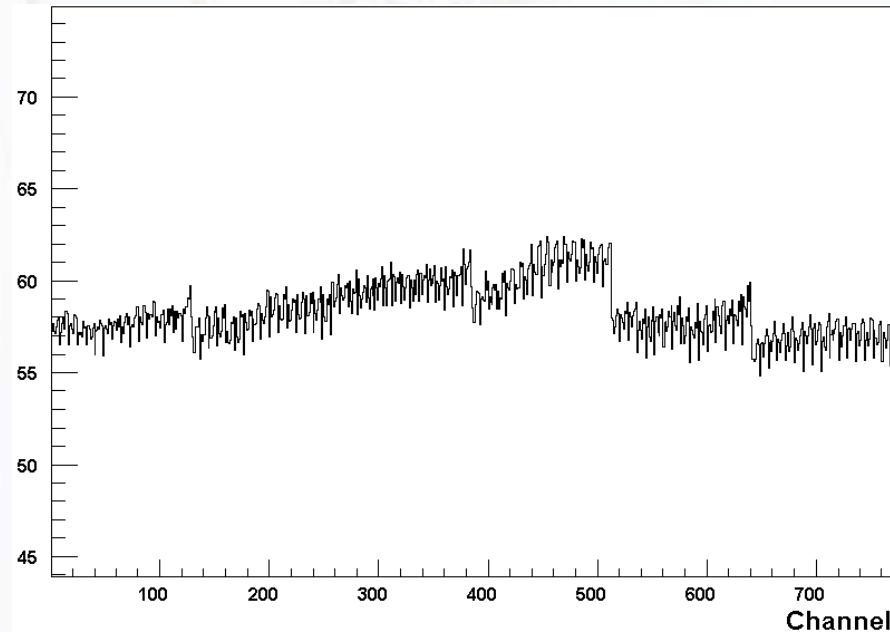
New Frontend

Noise and Raw Noise in Deconvolution Mode, Inverter off

- Calibration pulse height nearly identical



Old Frontend



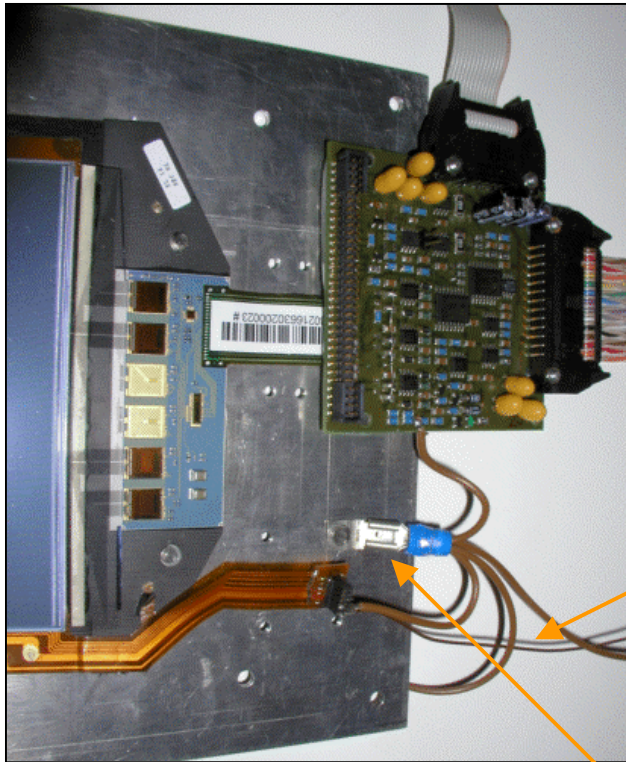
New Frontend

Fitted height of calibration pulses

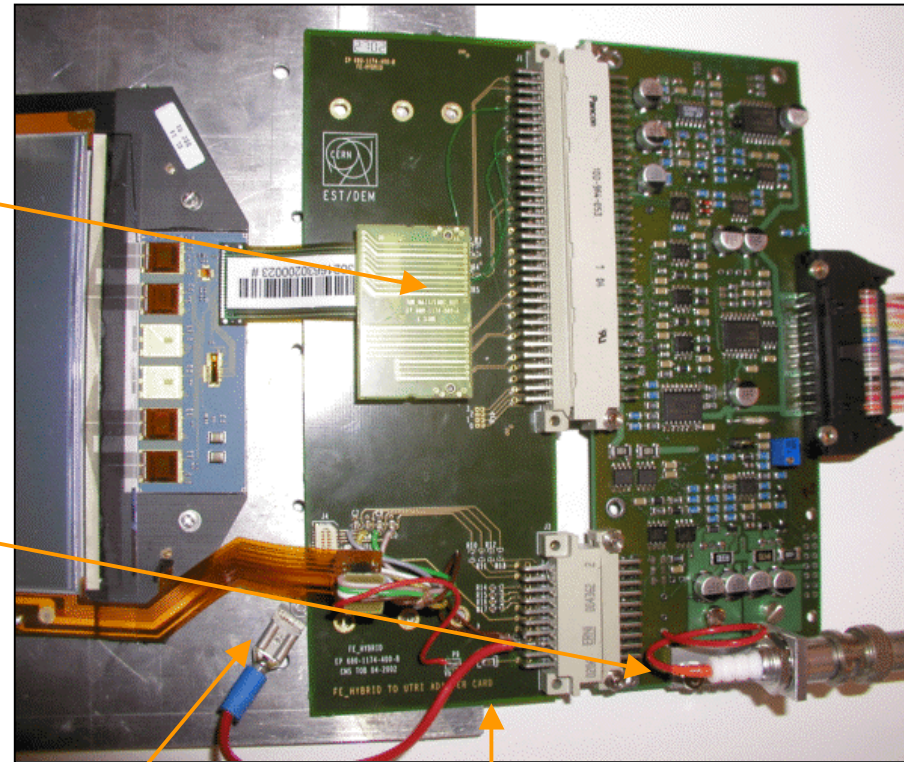
The background of the slide is a faded, repeating pattern of detector modules, likely calorimeter cells, arranged in a grid. Each module is rectangular with a central square area and some electronic components at the top.

Comparison in Module Tests

Old Frontend



New Frontend



NAIS-ERNI
adaptor

HV

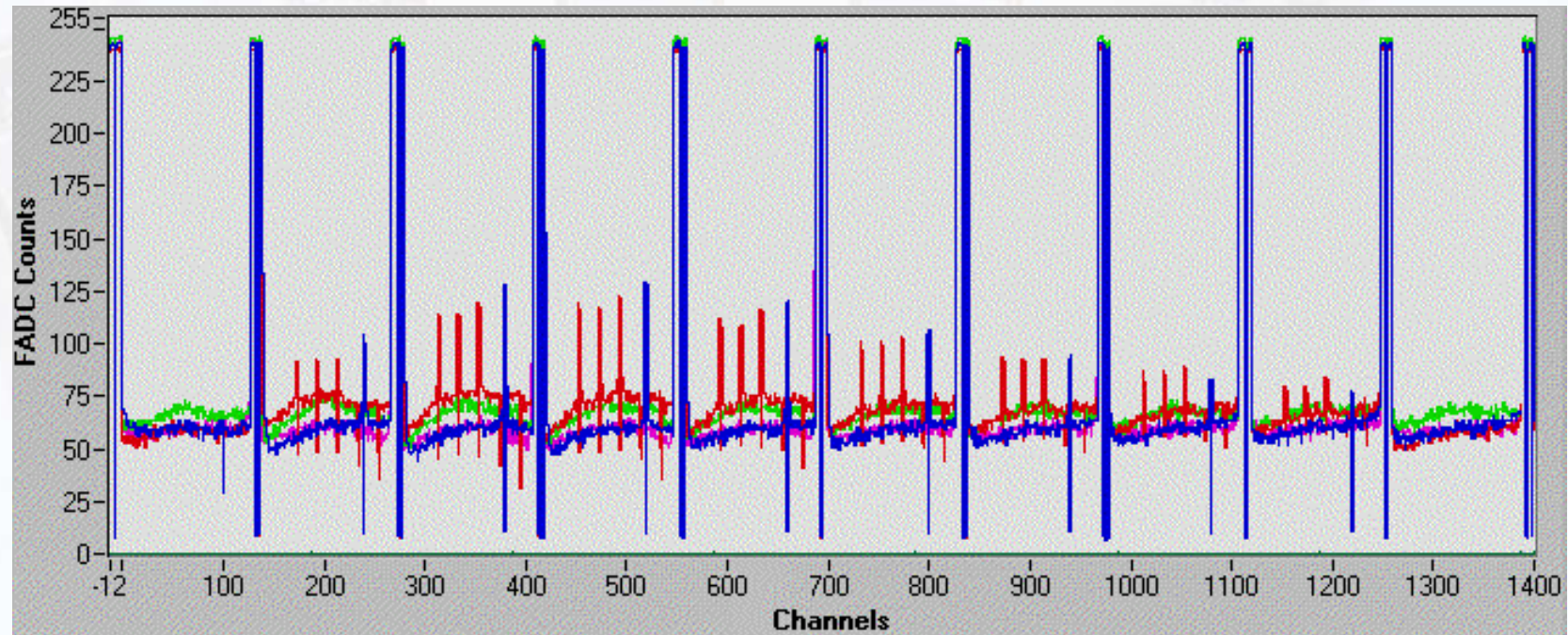
Common ground point
on the carrier plate

FE Hybrid to UTRI
adaptor card (TOB)

All measurements with TEC module 23 (1 open bond, 2 shorts, 3 pinholes)

- Old and new Frontend adaptor give the same results
 - Mean noise of a certain APV is identical
 - Noise of healthy channels within statistical variations
 - With new FE adaptor smaller at module edges if carrier plate is grounded
- Small differences for faulty channels due to slightly different common mode

- *Requires update of the ARC firmware*
- Signal of 2V volts is “put on the HV line” (Rise time of some ns)



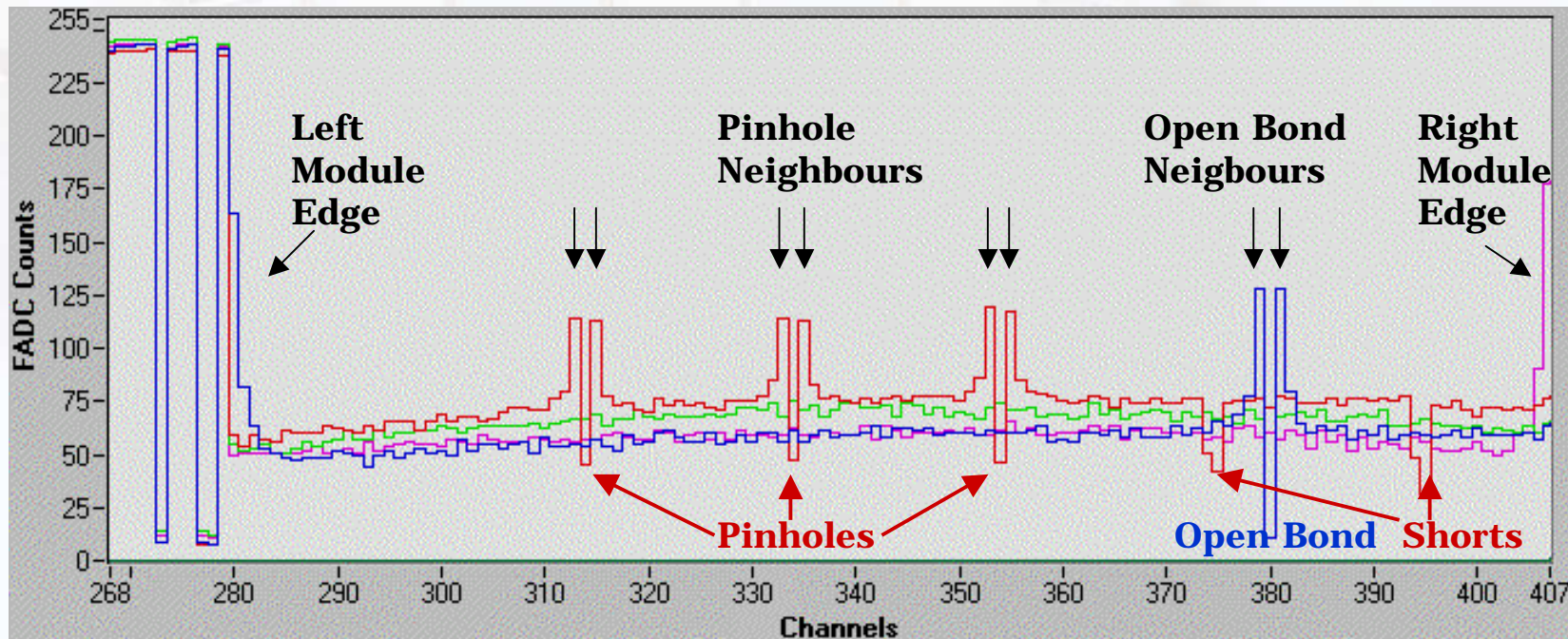
The picture shows the data of 10 consecutive pipeline entries representing the time evolution of the backplane pulse signal. The four different colours represent the four APVs. (APVs in three sample mode, Trigger 00000010 01001001)

Closer look on one frame:

⇒ All faults are obvious

fakes
(obvious
but OK)

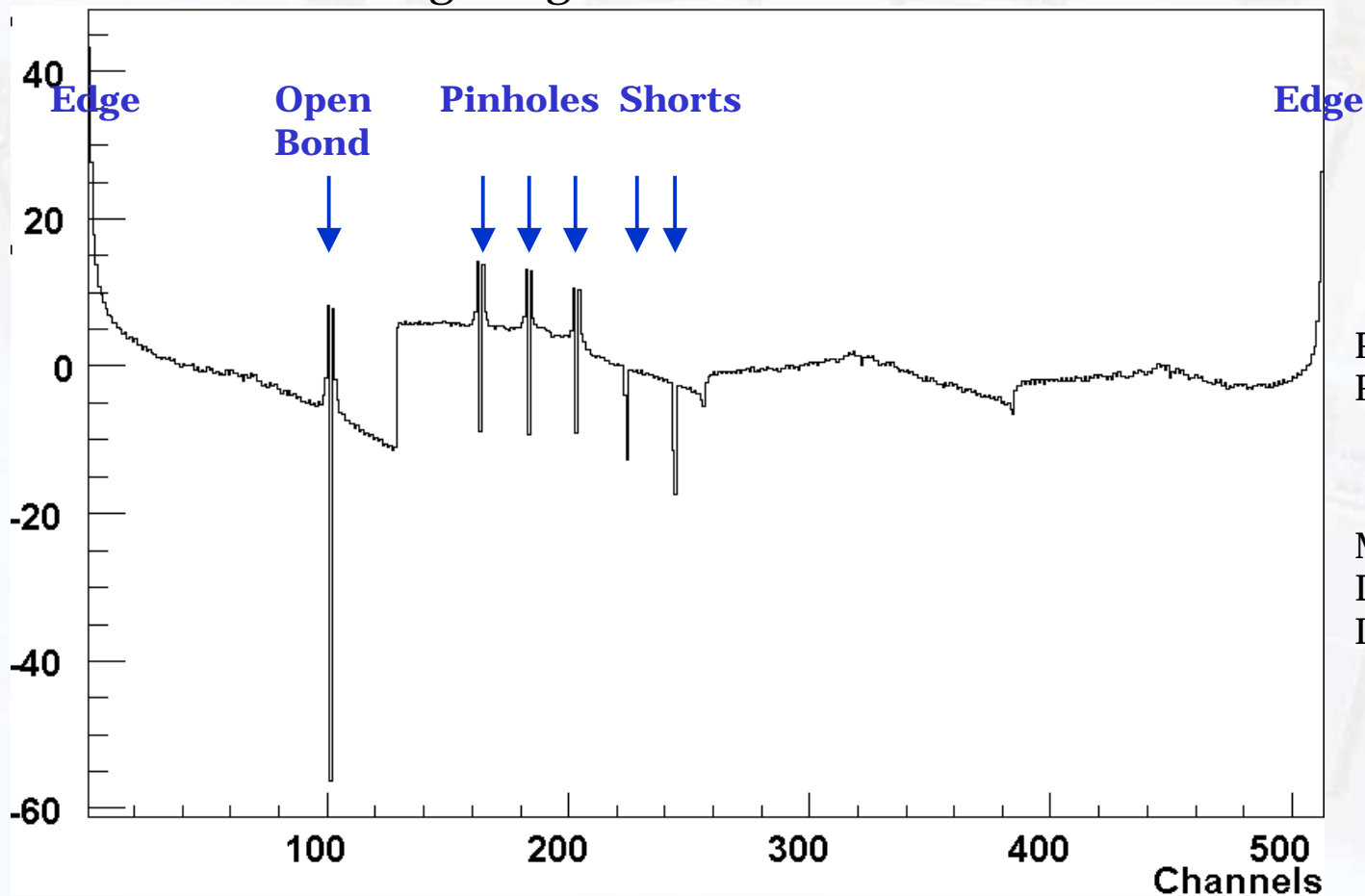
real
faults



Faults have lower pedestal, fakes have higher pedestal
But will it always be that simple?

(APVMode : ????????)

- Measure difference of pedestals with and without backplane pulse
 - All faults can be found !
 - But huge edge effects

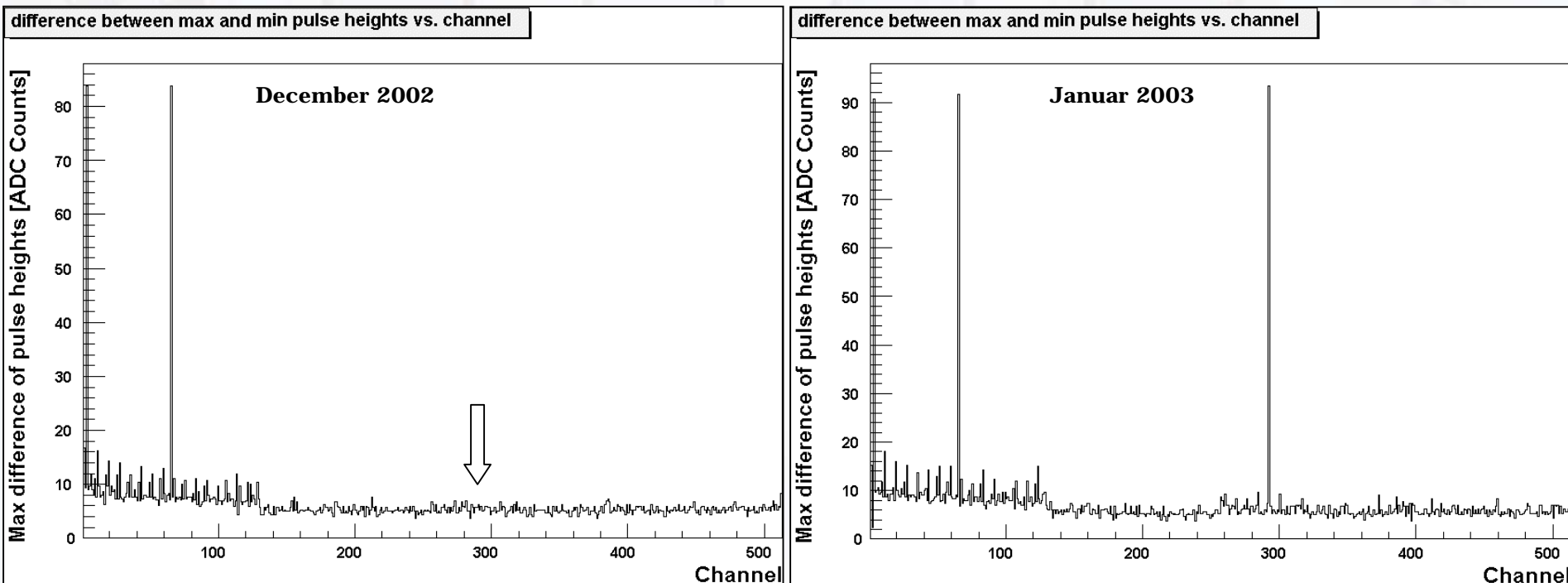


Plot shows
 $\text{Ped}_{\text{normal}} - \text{Ped}_{\text{backplane}}$

Measurement with
 Deconvolution
 Inverter on

- Pinhole test finds pinholes
 - But does it harm the detector ?
- New ARCS release next week
 - Can generate DB compatible XML files
- New frontends are working and available

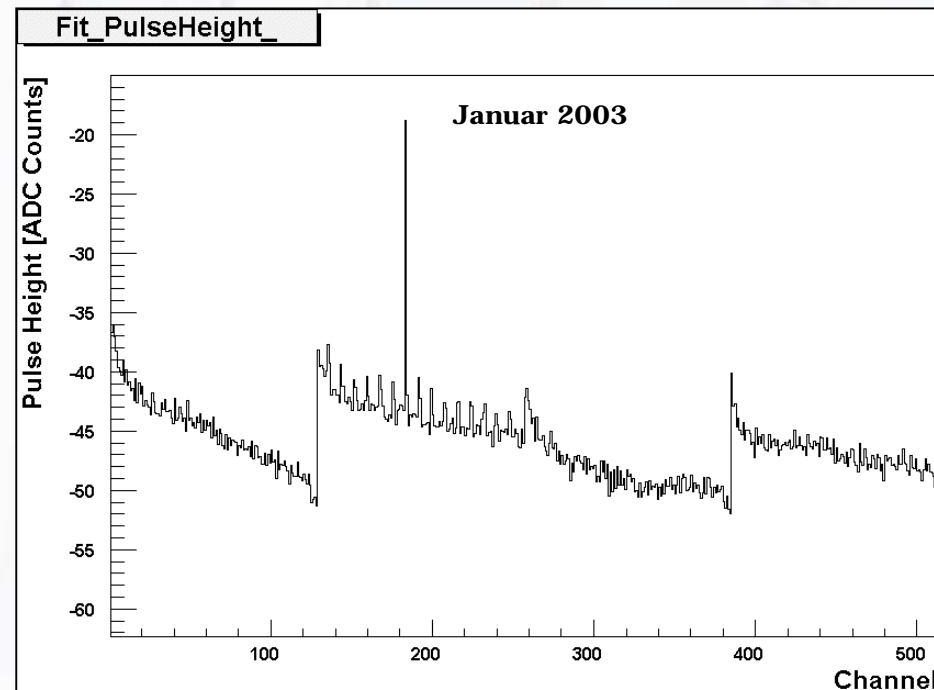
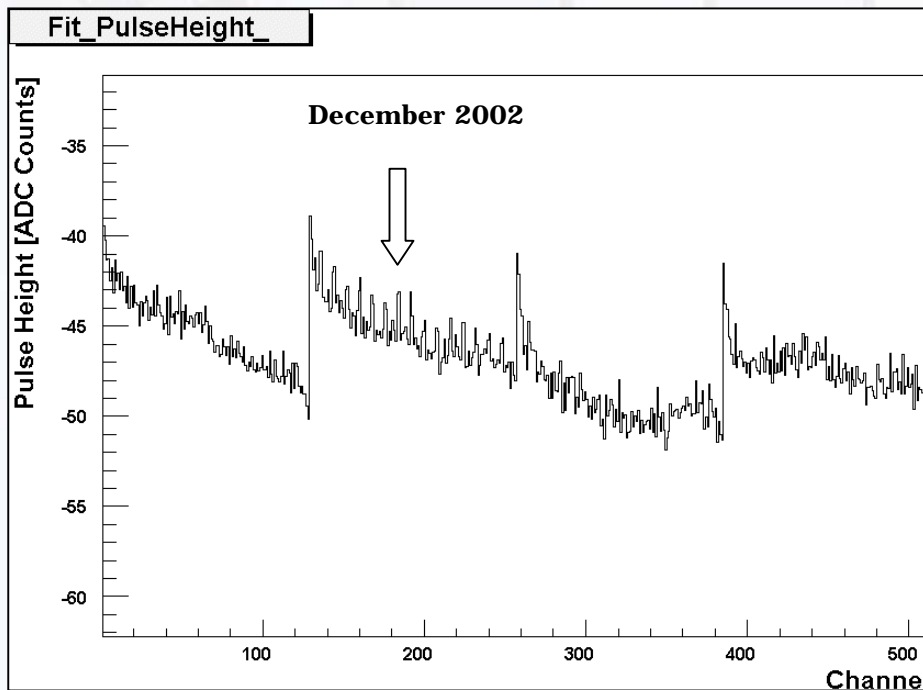
- Detected two new pinholes
 - Not a high leakage current pinhole
 - Channel has never been conspicuous in the first test run



result of the pinhole test (Frame ...643, Hybrid ...101, channel 292 resp. 221)



- was detected as a high leakage current pinhole
- Now behaves like a “normal” pinhole (conspicuous at low currents already)



fitted height of pulse shape in Dec. Mode / Inverter OFF (Frame ... 642, Hybrid ... 097, channel 183 resp. 330)

