Front end Hybrid Industrial Tester

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In collaboration with

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http://www.fynu.ucl.ac.be/themes/he/cms/activities/tracker/hybrids.html

FHIT status

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Now : 8 FHIT pcb = 3 dual-FHIT + 2 mono-FHIT

new :
- ARC system (*hardware & software*)
- FHIT firmware
- LabVIEW interface (*FHITS*)

} since Sept 2002

FHIT setup : being tested in Strasbourg…
- CT, ET, FT
- FHITS
- comparisons with other test stations
- reliability

Strasbourg feedback

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Good feedback from Strasbourg

=> bug corrections

=> measurements in industrial-like conditions

➔ reliability really improved

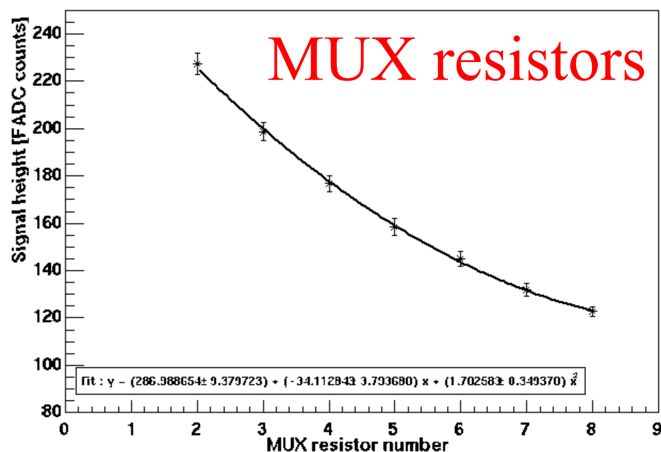
NEW Statistics !

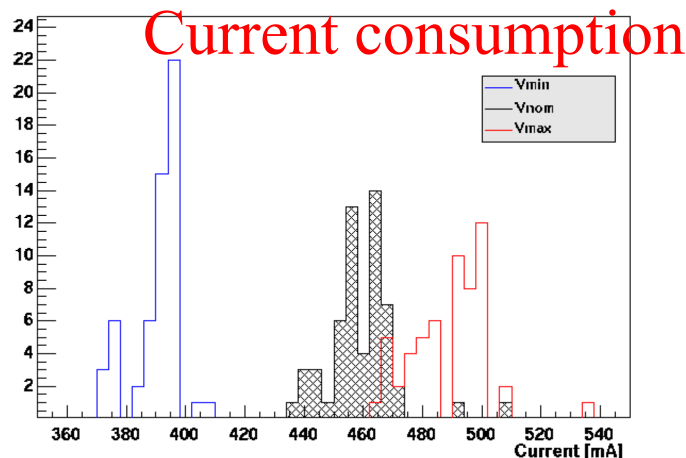
~100 FEH including :

1663 (~60)	TEC	Top	4 apv's
1664 (~10)	TEC	Bottom	4 apv's
1665 (~5)	TEC	Top	6 apv's
1667 (~5)	TIB	Top	4 apv's
1668 (~15)	TIB	Bottom	4 apv's
1670 (~2)	TIB	Bottom	6 apv's

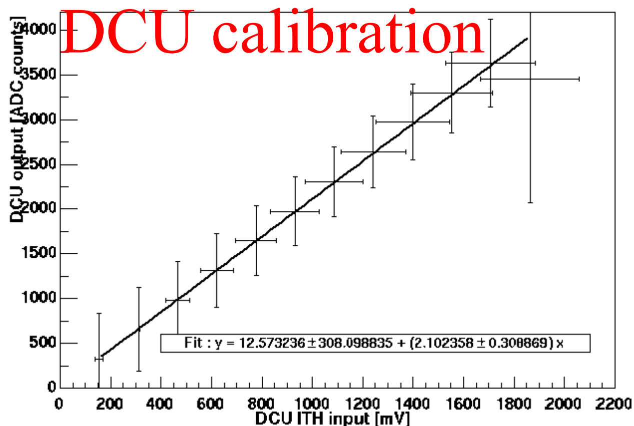
... I125, I250, DCU calibration, DCU channels, MUX resistors, pedestal, noise, rawnoise, ...

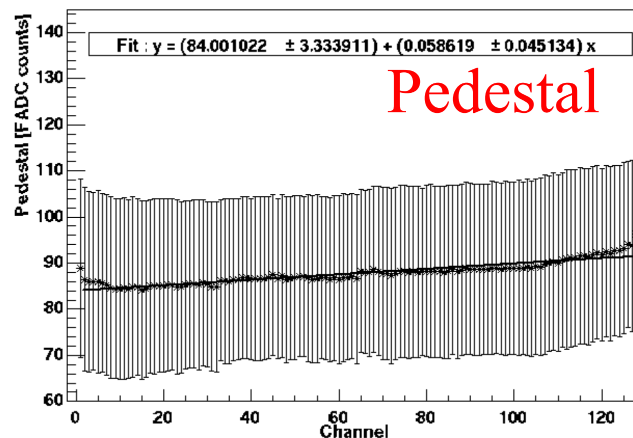
Some statistics…





Analysis not finished...





CT & ET

FHIT *almost* ready for industries…

- CT : binary subtests (*good* or *bad*)
- ET :
  - binary subtests
  - current measurements (one or all APVs biased)
  - DCU calibration data (linear / non-linear regions)

… but not yet !

Characterization from data analysis

ET : current measurements…

Proposal for acceptation intervals on currents…

(from statistical distributions)

I_{125} one APV biased	V_{min}	[42 ; 78] mA
	V_{nom}	[48 ; 84] mA
	V_{max}	[52 ; 88] mA
I_{250} one APV biased	V_{min}	[220 ; 320] mA
	V_{nom}	[300 ; 400] mA
	V_{max}	[320 ; 420] mA

$\approx [\ 0.7\mu\ ;\ 1.3\mu\ ]$

and the same for $I_{...}$ all biased

BUT …

… comments are welcomed !

… acceptation intervals

I_{125} all APV biased	V_{min}	[?] mA
	V_{nom}	[?] mA
	V_{max}	[?] mA
I_{250} all APV biased		
≈ [0.7μ ; 1.3μ]		

Problem with these measurements !

I(V250) =f(V250)
comparisons between test setups

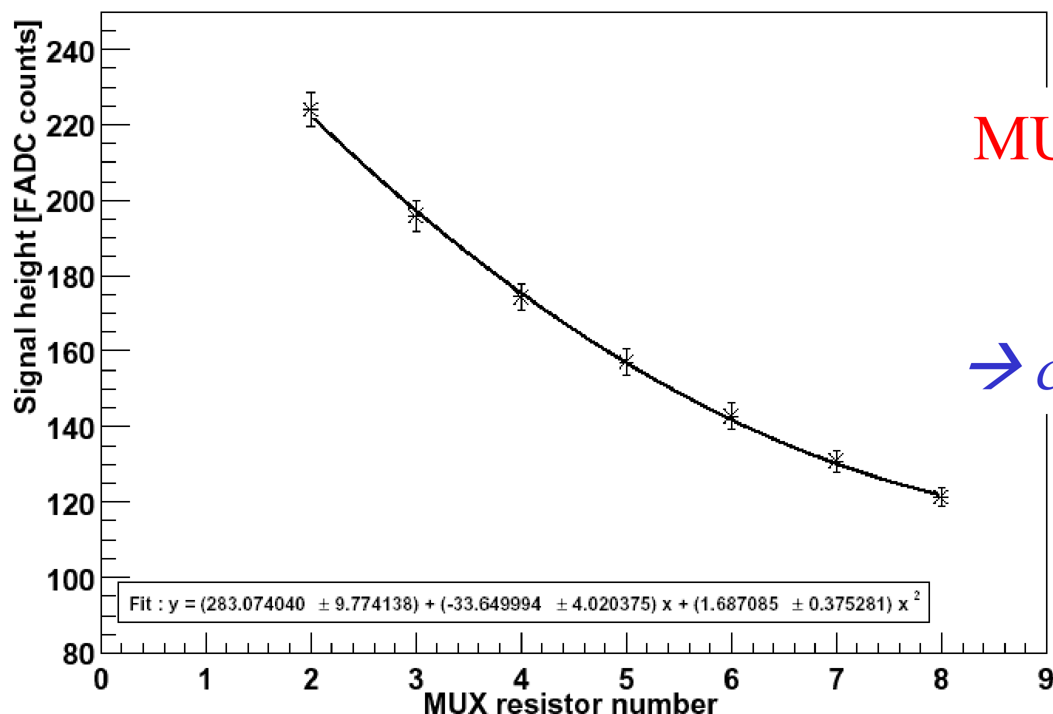
1000
900
800
700
600
500
I(V250) [(mA]
2.2
2.3
2.35
2.4
2.45
2.5
2.55
2.6
Voltage [V]
ARC
FHIT
MESURES FHIT
mesures FEC-CCU avec pince Ampérique TCP 202 TEKTRONIX
Mesures ARC
Poly. (MESURES FHIT)

→ *Not the same as the ones from other test stations* (*P Graehling*)

FT : MUX test

What does the Industrial Test consist in ?

http://www.fynu.ucl.ac.be/themes/he/cms/activities/tracker/ITcontent.html



MUX resistors : signal height

Good quadratic fit

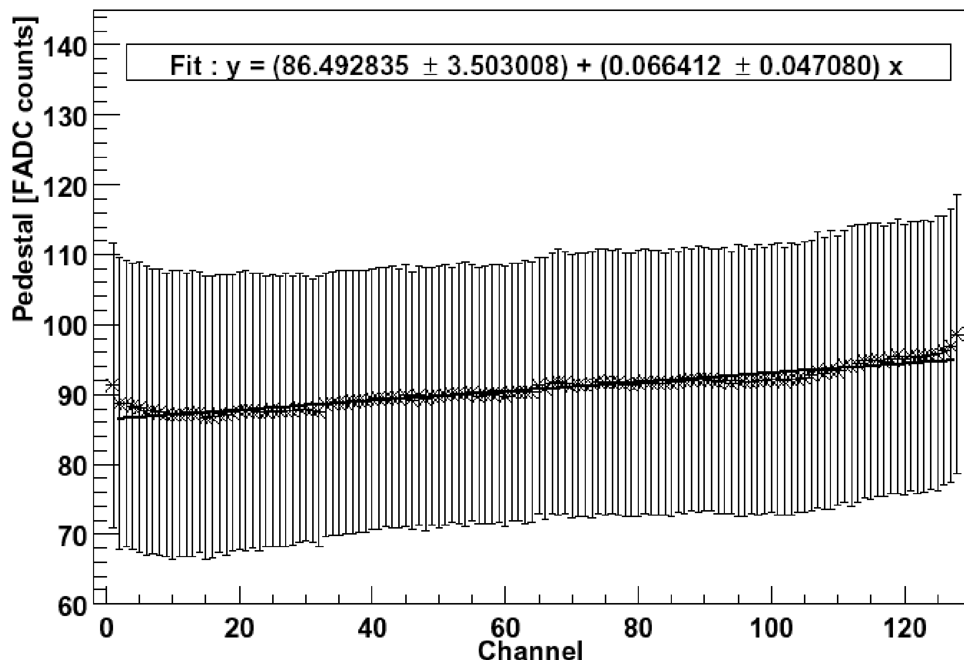
→ *conditions on fit parameters ?*

Gain test : still to be analyzed…

FT : pedestal test

Pedestal : good linear fit

→ *conditions on fit parameters ?*



good / bad channels

[0.8 μ ; 1.2 μ]

According to

"Procedures on module test"

L. Demaria, M. Meschini, F. Hartman, G.Dirkes

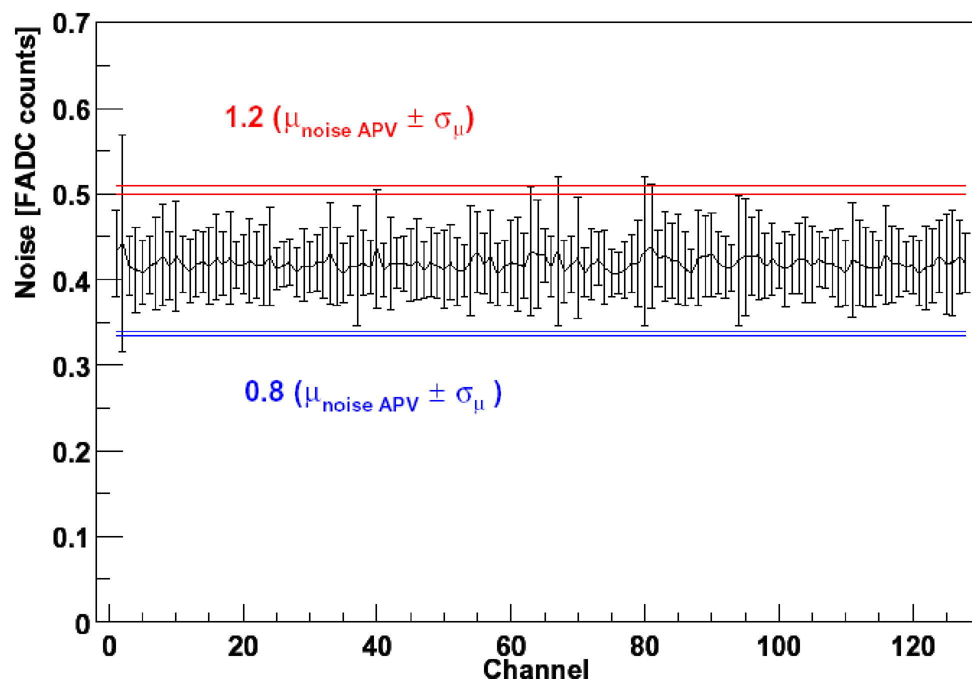
FT : noise test

Noise : bad channel definition should be refined

→ too sensitive (20% : too small) ==> not always reproducible

→ noise should have upper (and lower) limit(s)

in case of an high noise mean, for instance



good / bad channels ?

[0.8 μ ; 1.2 μ]

Proposal : noise should be in [0.1 ; 1.2] ADC counts and the interval around the mean should be increased…

(as well as trials with more data)

IT conclusions

Waiting for enough data to deal with FT acceptation intervals
→ *FHIT should not be sent in industry before having this data*

BUT

FHIT is almost ready for CT & ET

\+ : - good stability
- well tested

\- : - current measurements ~ relative to other test stations
- minor instabilities in LabVIEW code (FHITS)
- ERNI connector not really supported

Foreseen updates

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Things to be realised:

- integration of new part numbers (as now TOB ≠ TEC)
  new firmware revision needed

- corrections of minor bugs
  in debug mode (NOT for industries)
  in FT (NOT for mono-FHIT)
  instabilities

- compatibility with new ERNI adapters (NOT available)
  waiting for information => new firmware

- FHIT test procedures

- link to database : from ASCII to XML files...

(next slide…)

XML and database

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Translation from FHIT log file to database XML file :

- by a dedicated C/C++ program (not by FHITS)
  - more efficient (faster)
  - easily updated (factorised from FHITS)
- not during IT (performed on several log file, afterwards)

Strong collaboration with P. Juillot (Strasbourg)

Available next weeks…

Next weeks…

Software debug (*Louvain, Aachen, Strasbourg*)

Data analysis and characterization

… and FHIT can be sent to industries…

XML translation

FHIT tester