



PRELIMINARY NOISE TESTS WITH TIB MODULES

- Modules number and Type
- Hardware & Software used
- Experience with Antwerpen Software
- Client developed in Pisa
- Noise results
- The FLEX Hybrid Module
- Conclusions



Modules number and Type



Module N°	Sensor Type	Hybrid Type
TIB004	1 Hamamatsu	FLEX + SKT
TIB005	2 CSEM	FR4 v1
TIB007	1 Hamamatsu	FR4 v2
TIB010	2 CSEM	FR4 v1
TIB012	2 CSEM	FR4 v1
TIB023	1 Hamamatsu	FR4 v2
TIB024	1 Hamamatsu	FR4 v2

TIB005, TIB007 & TIB010 used in the recent Beam Tests at PSI

TIB023, TIB024 now at CERN to compare CMS like and ARC systems

SKT : Short Kapton Tail (Different adaptors)

FR4 v1 : Kapton cable connected via a connector

FR4 v2 : Kapton cable soldered



Hardware & Software used



Hardware : CMS like (FED, FEC, TSC)

Software :

Server : CMS like (Lyon)

Client : 1) **Lyon** : HybridDialog(Qt based GUI)

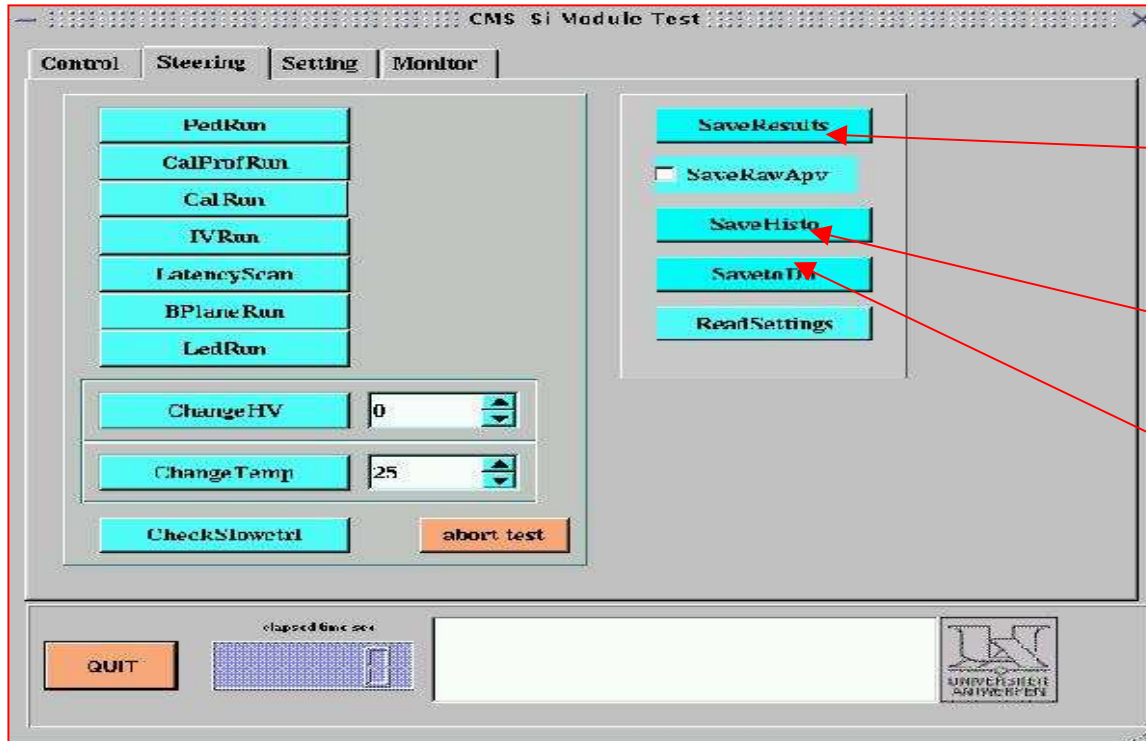
+ macros from Torino for analysis

2) **Antwerpen** : autonomous software (Qt based GUI)

3) **Pisa** : TT6 analysis software (ROOT Based GUI)



Experience with Antwerpen Software



Version Lt_0_05

Save Results in Local
ROOT based DB

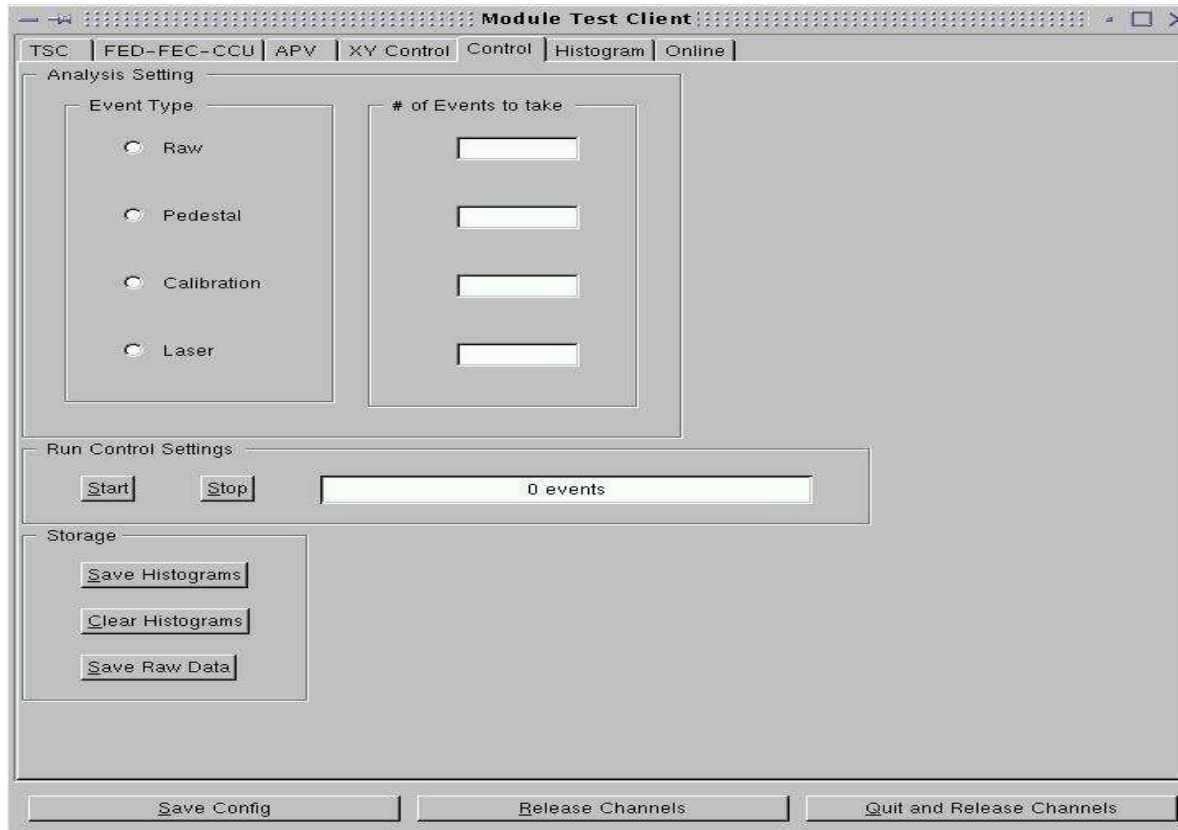
Save Histograms in
the way
HybridDialog does

Save Results in an
XML file for
insertion in the
TrackerDB

- To run needs the servers activation and everything else is controled from two XML files
- Root version 3_2_7 not fully compatible with 3_1_6 that HybridDialog uses
- Tried to pass information from the XML file to the TEST TrackerDB via BigBrowser (not successful because the actions do not match)



Client developed in Pisa



Not yet officially released

Based on ROOT 3_2_7 GUI

Uses TT6 algorithms (ORCA ApvAnalysis framework) for the data analysis

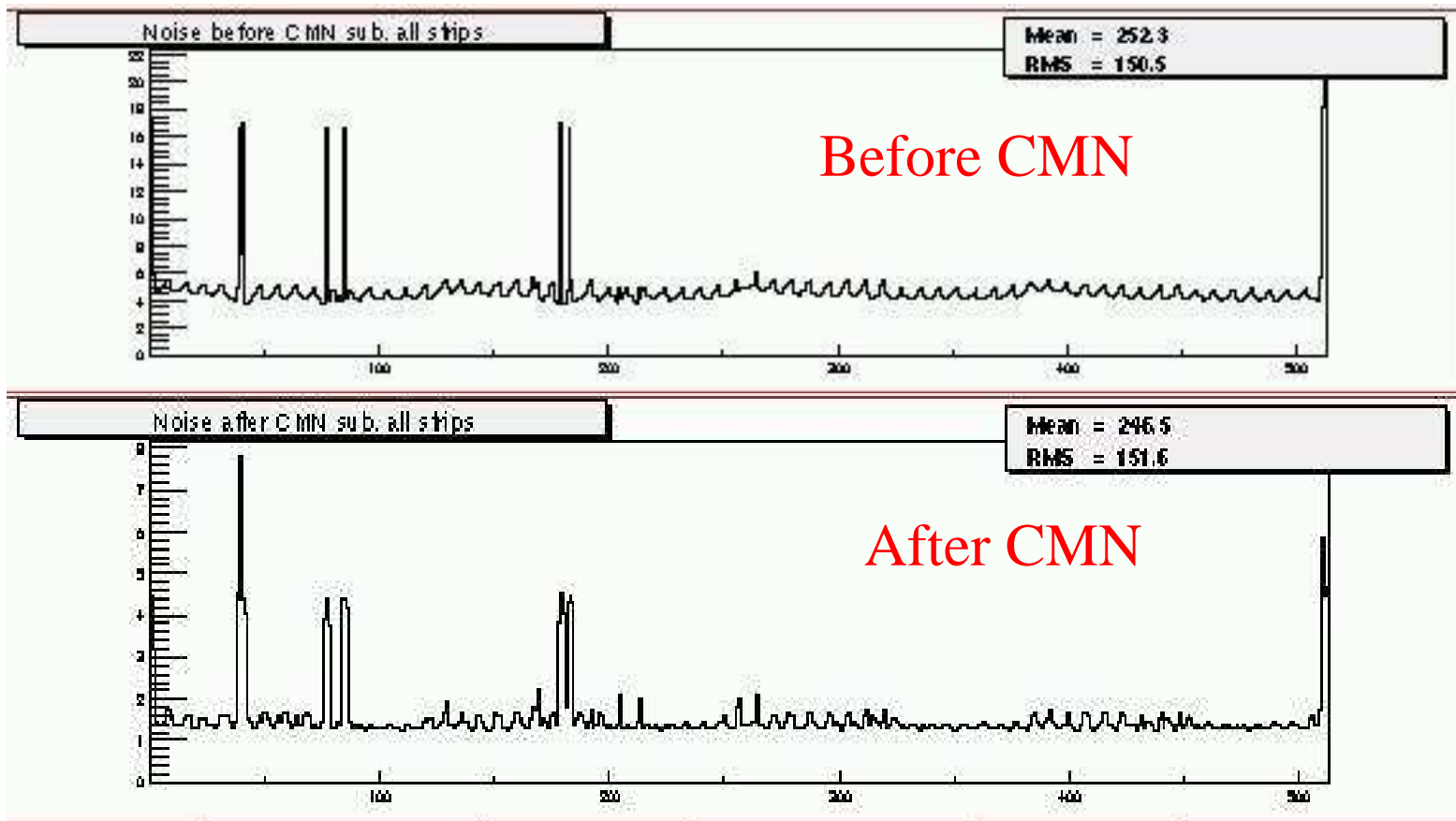
- Aims:
- 1) Implementation of the Beam Test algorithms in the laboratory Module tests
 - 2) Perform LASER scan tests (Deep tests) for the Modules



Noise results



TIB007 (Pisa) Peak mode, VUTRI, Lyon Software



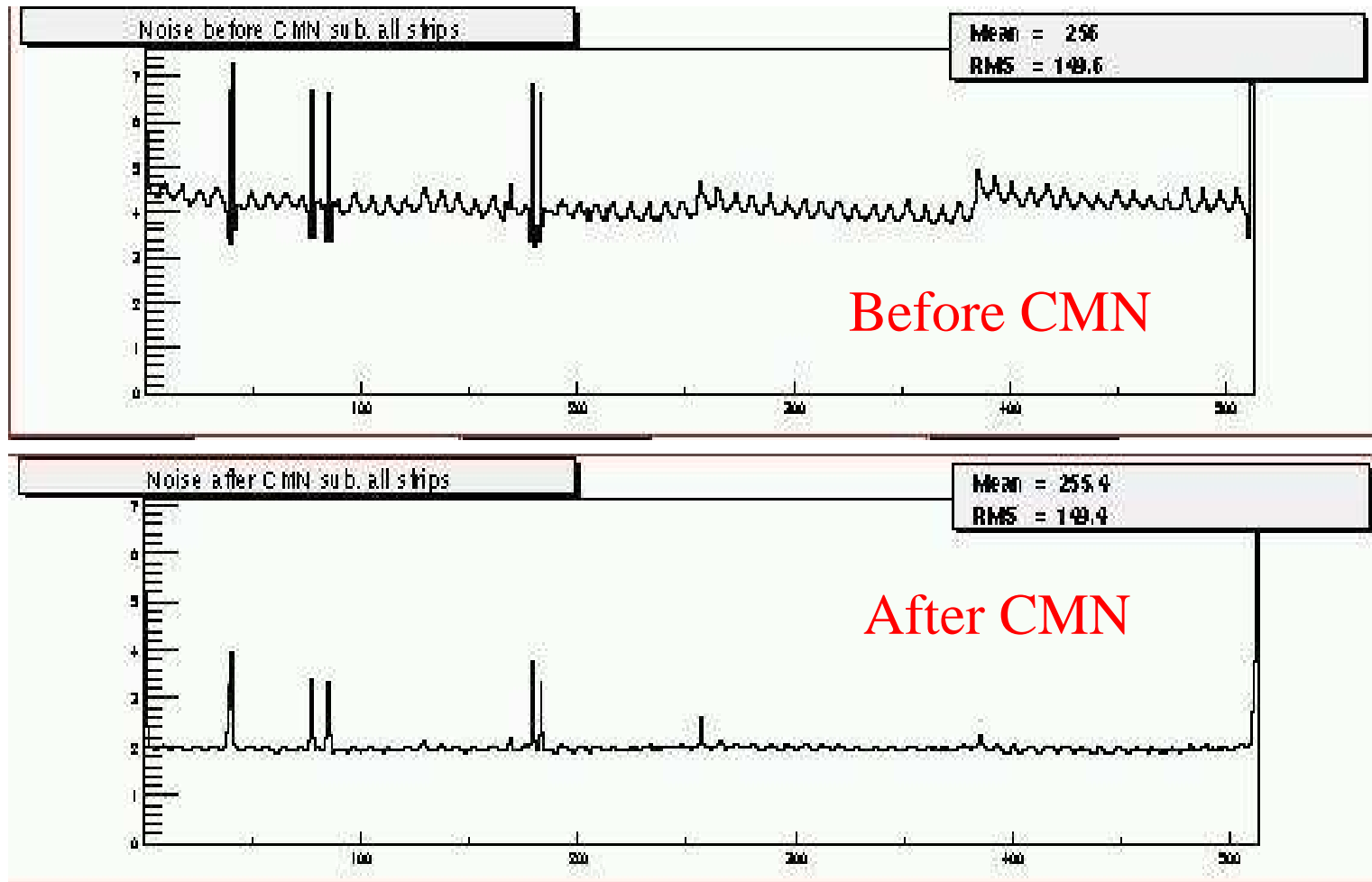
STRIPS : 39,41,77,85,179,183,511(missing bond between chip and pitch adapter).



Noise results (Cont.)



TIB007 (Pisa) Deconvolution mode, VUTRI, Lyon Software

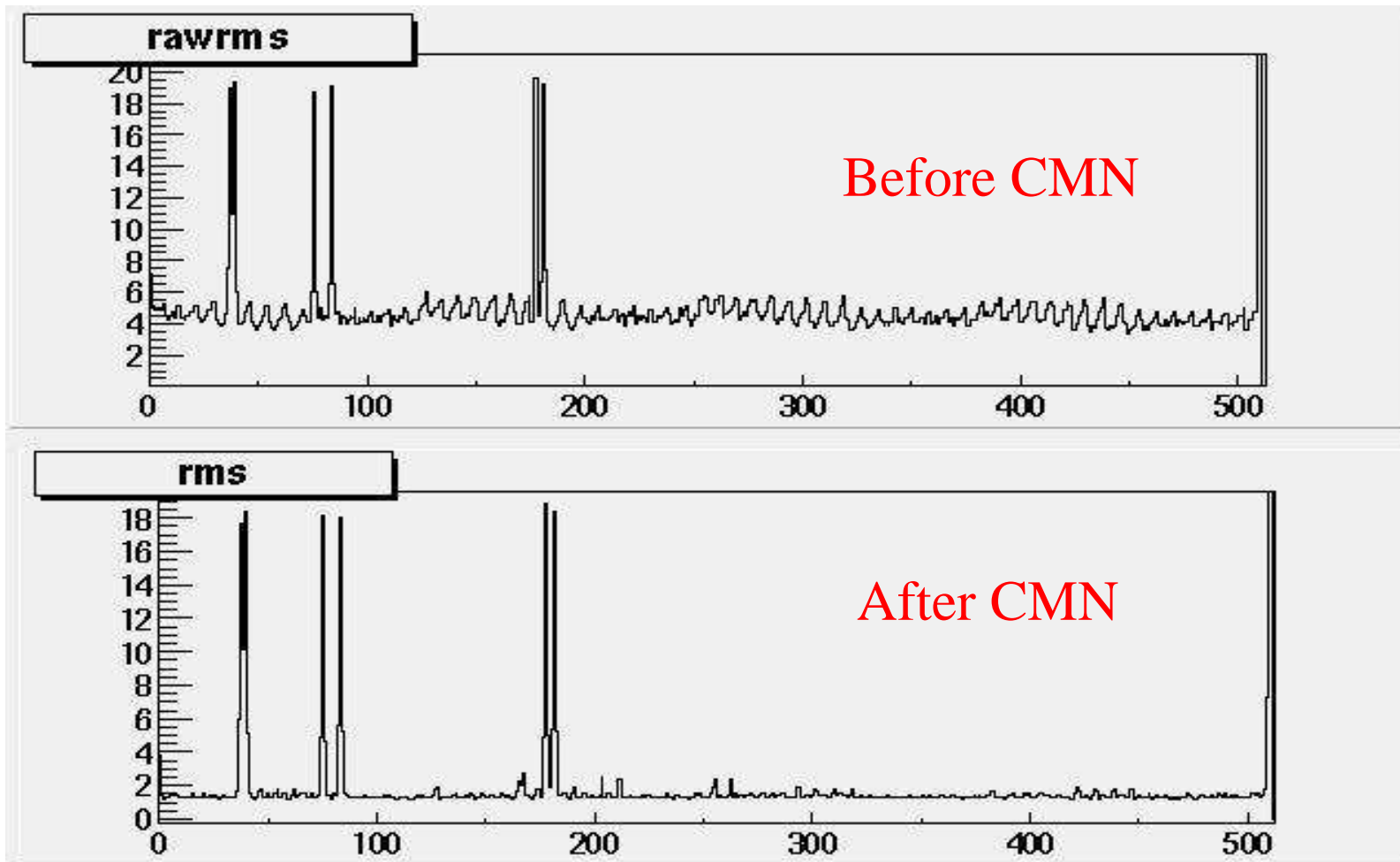




Noise results (Cont.)



TIB007 (Pisa) Peak mode, VUTRI, Antwerpen Software

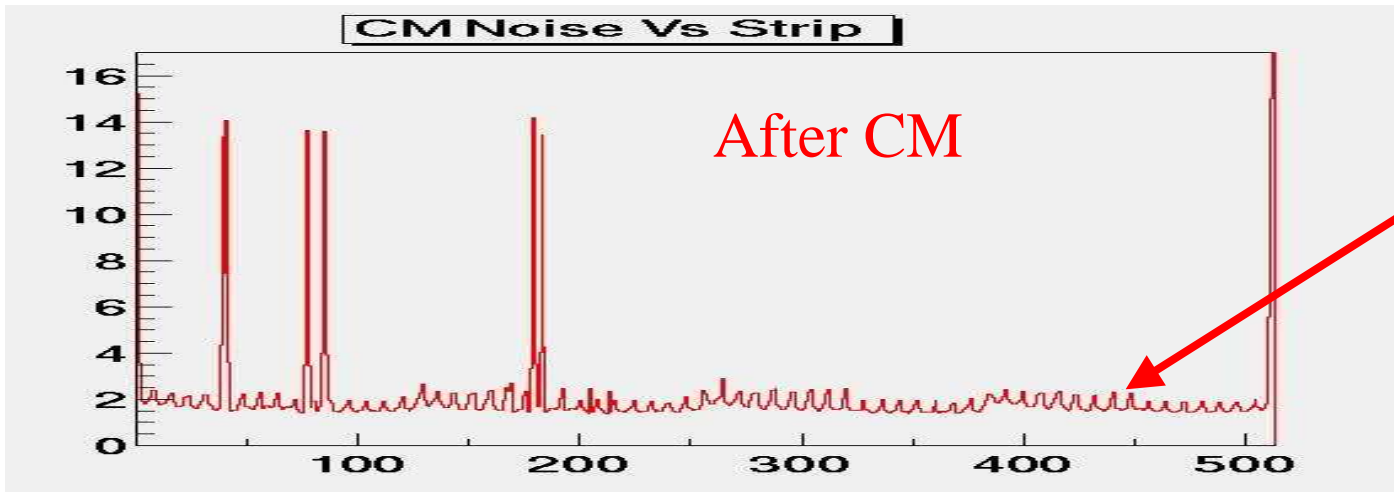




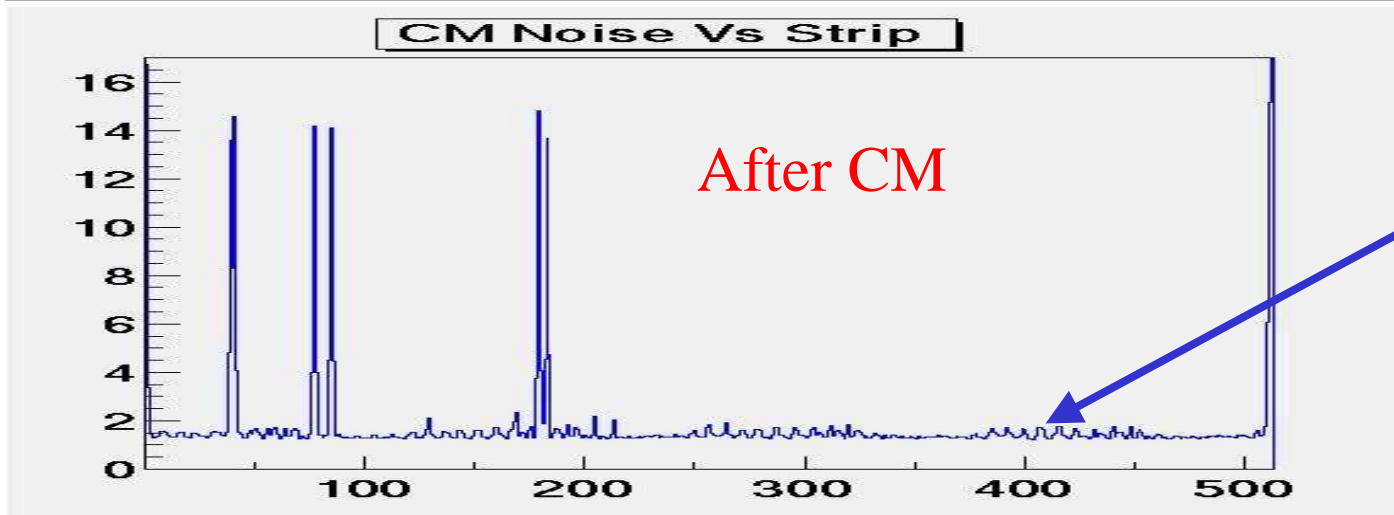
Noise results (Cont.)



TIB007 (Pisa) Peak mode, VUTRI, TT6 Software



CM calculated from average after discarding signal and dead-noisy strips



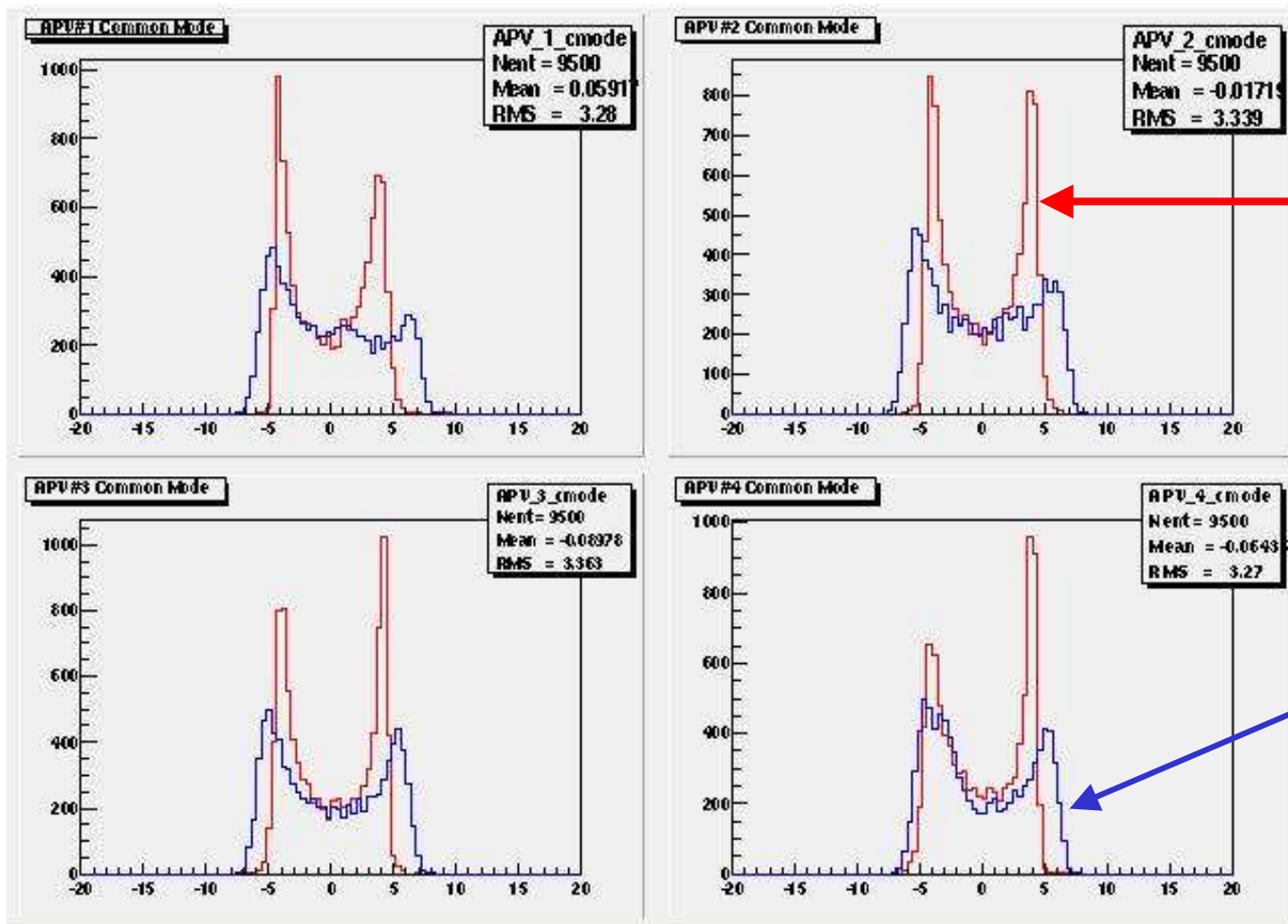
CM calculated from average after a symmetric truncation (dead-noisy strips are removed)



Noise results (Cont.)



TIB007 (Pisa) Peak mode, VUTRI, TT6 Software



CM calculated from average after discarding signal and dead-noisy strips

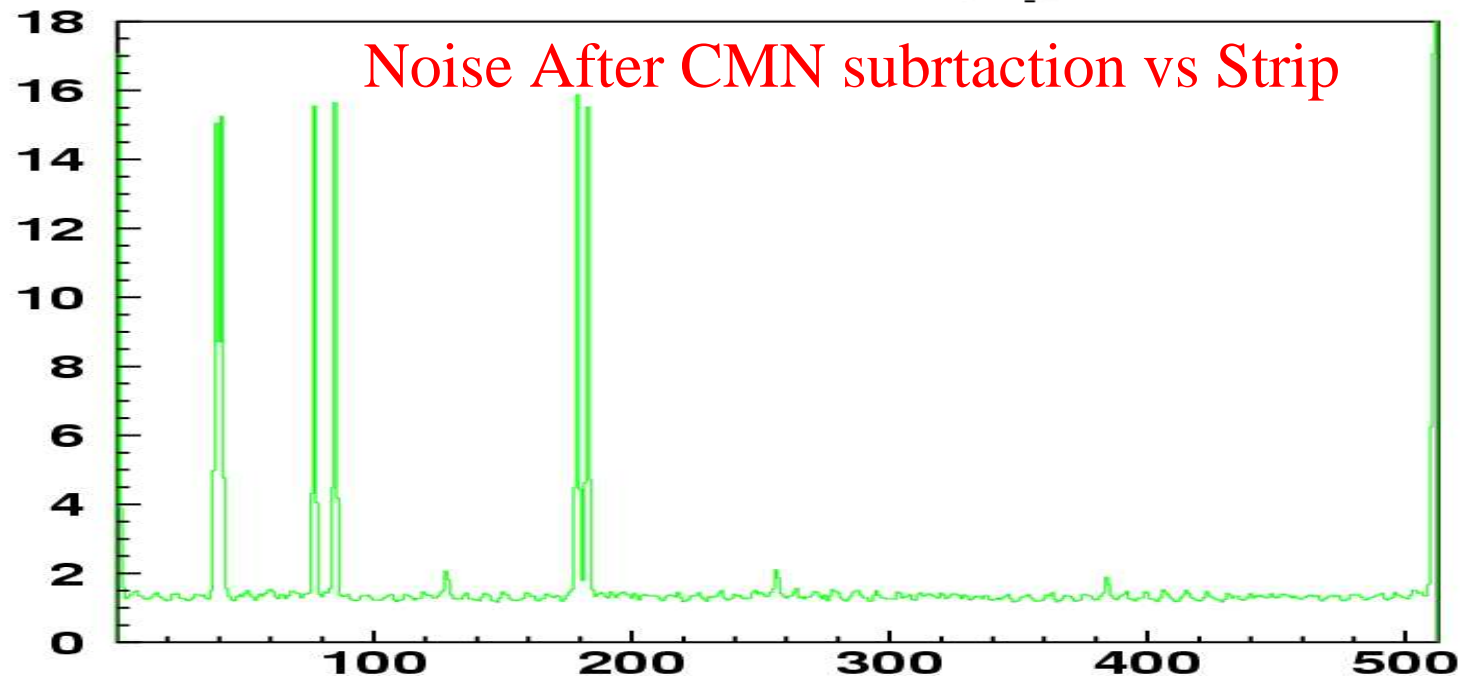
CM calculated from average after a symmetric truncation (dead-noisy strips are removed)



Noise results (Test Beam Data)



TIB007 (PSI Data) Peak mode, VUTRI



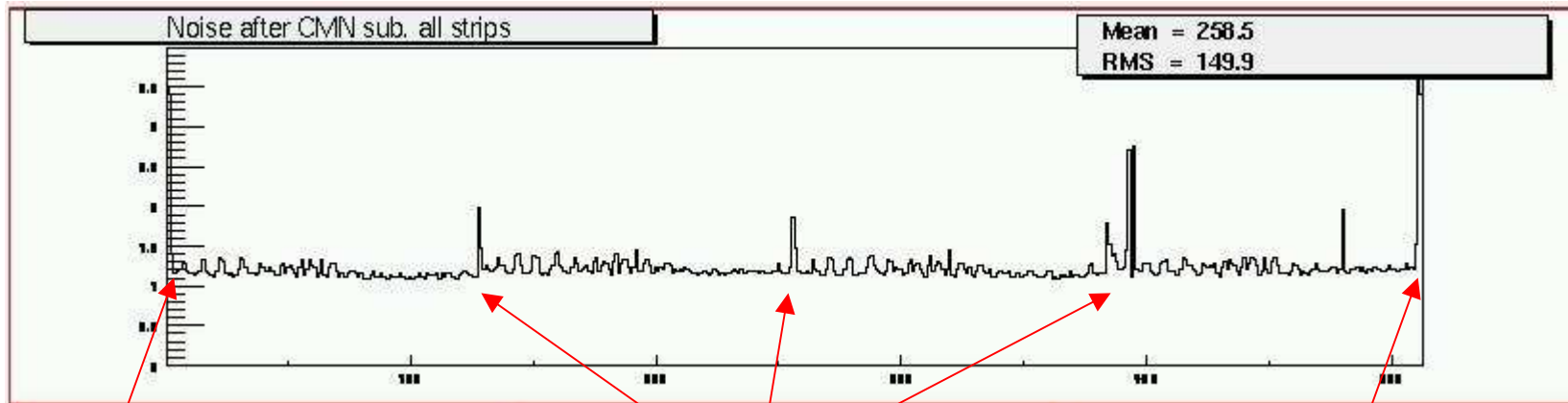
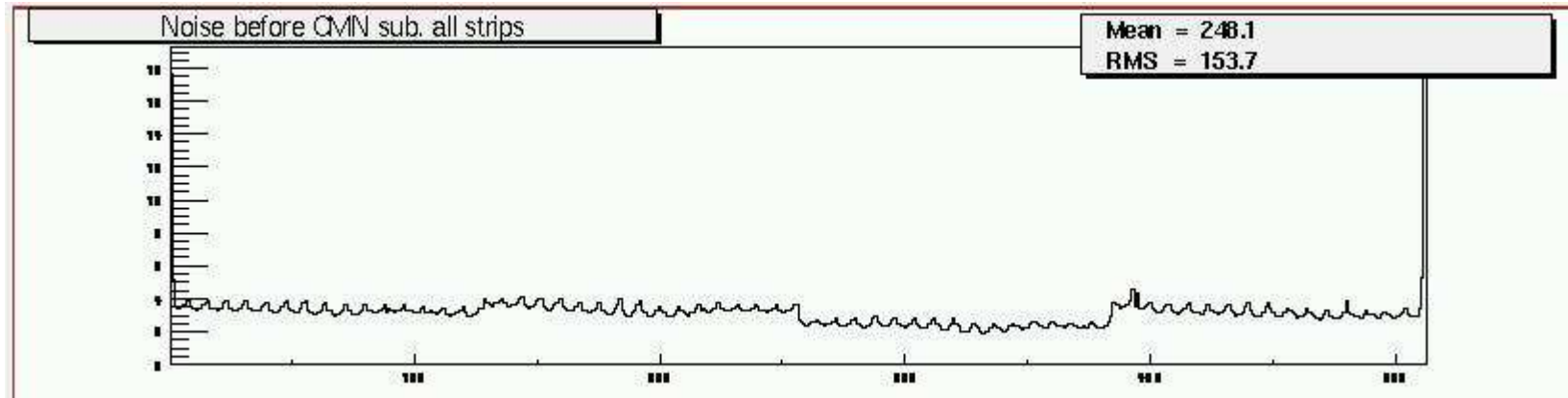


Noise results (Cont.)



TIB005(Florence)

Peak mode, VUTRI, Lyon Software



2-3 FIRST strips noisy

Noisy APV Edges

2-3 LAST strips noisy

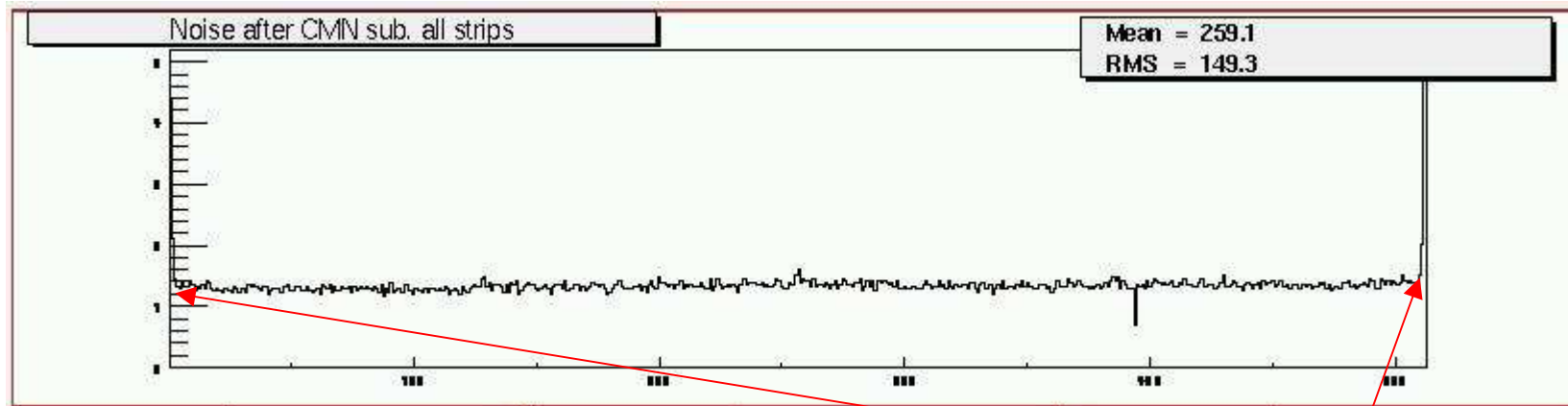
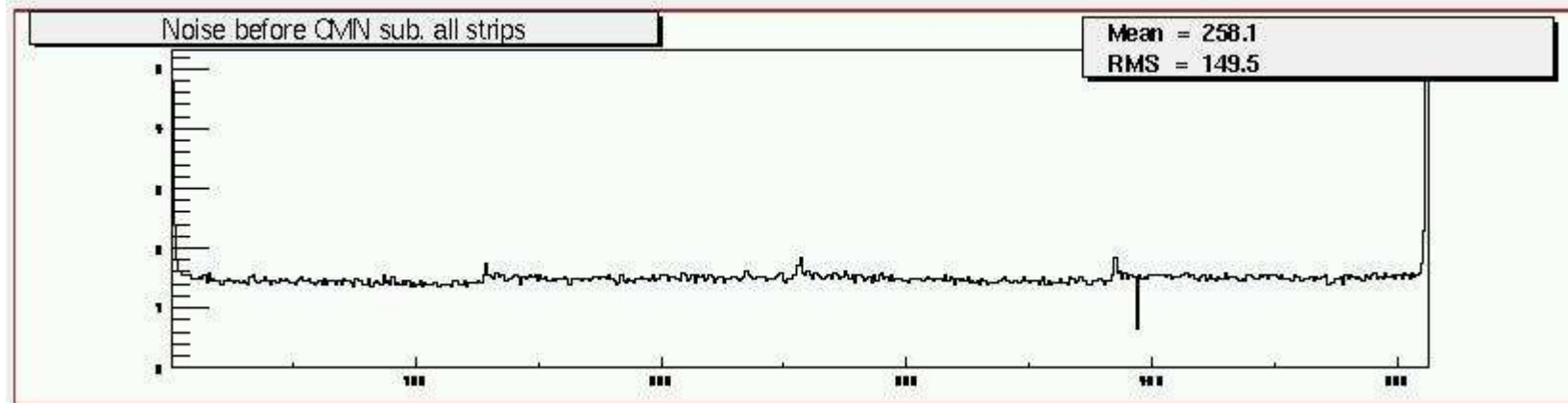


Noise results (Cont.)



TIB005(Pisa)

Peak mode, UTRI, Lyon Software



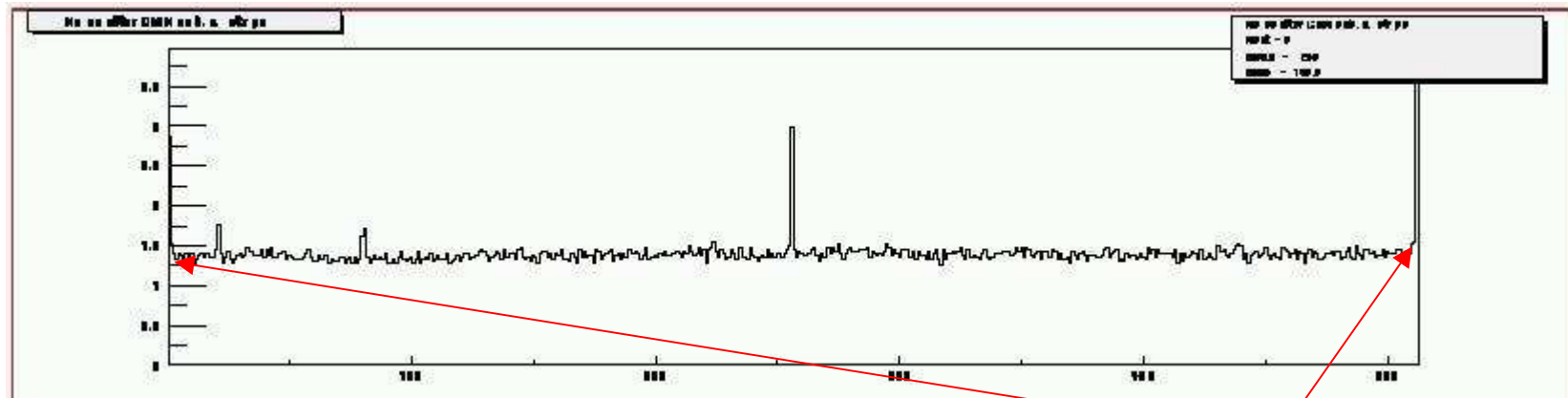
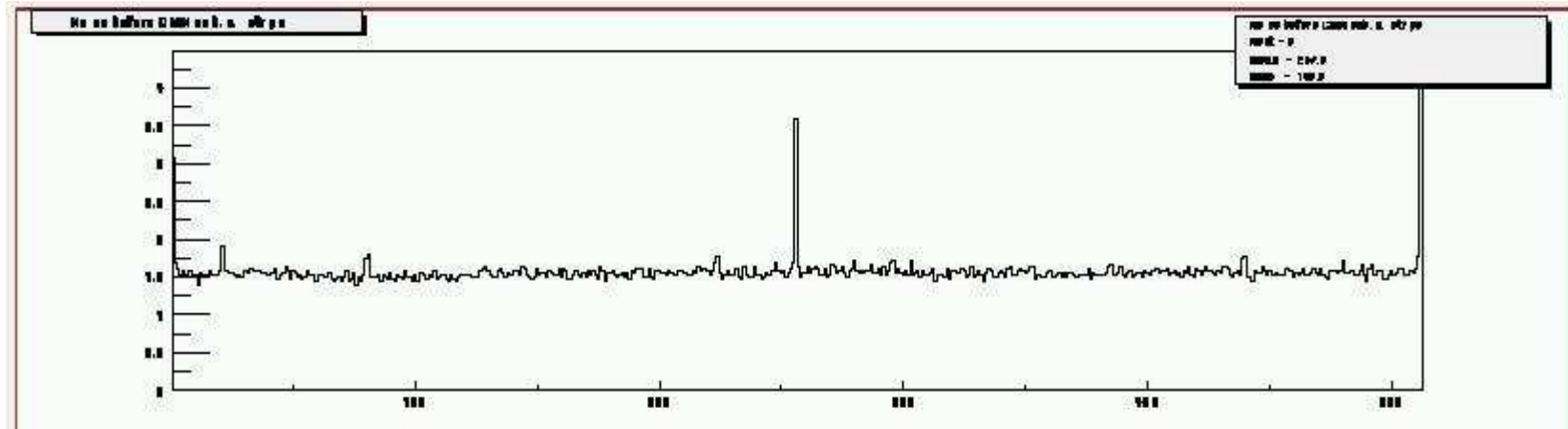
Noisy APV Edges NOT seen EXCEPT FIRST & LAST strips



Noise results (Cont.)



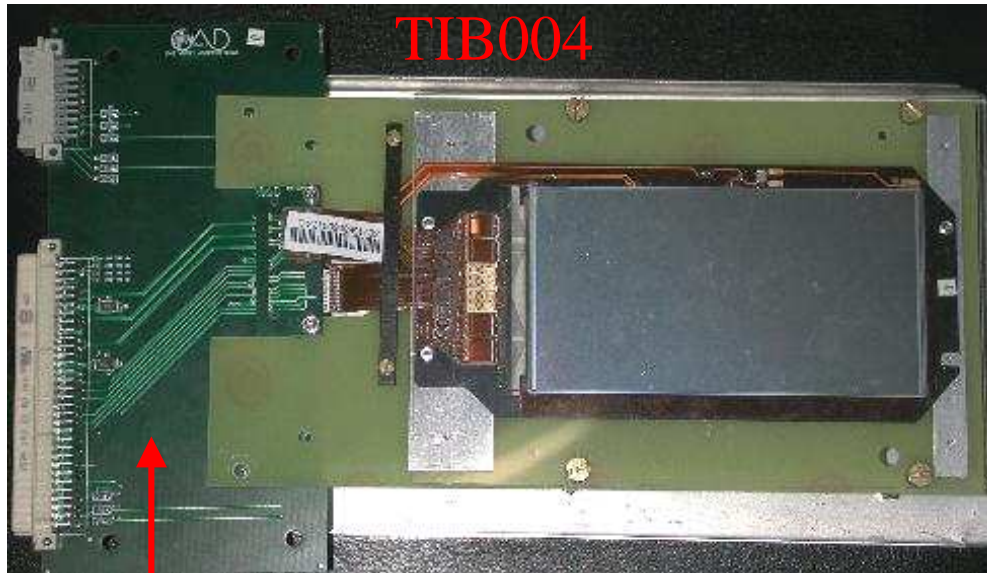
TIB010 (Bari) Peak mode, VUTRI, Lyon Software



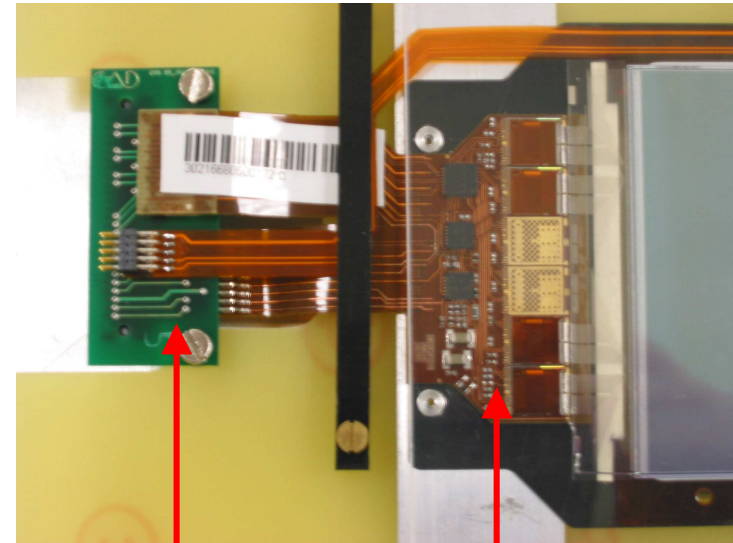
Noisy APV Edges NOT seen EXCEPT FIRST & LAST strips



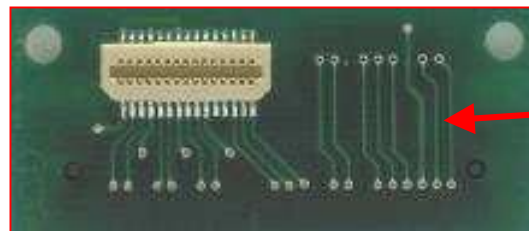
The FLEX Hybrid Module



TIB004



ERNI – VUTRI
Adaptor



FLEX Hybrid

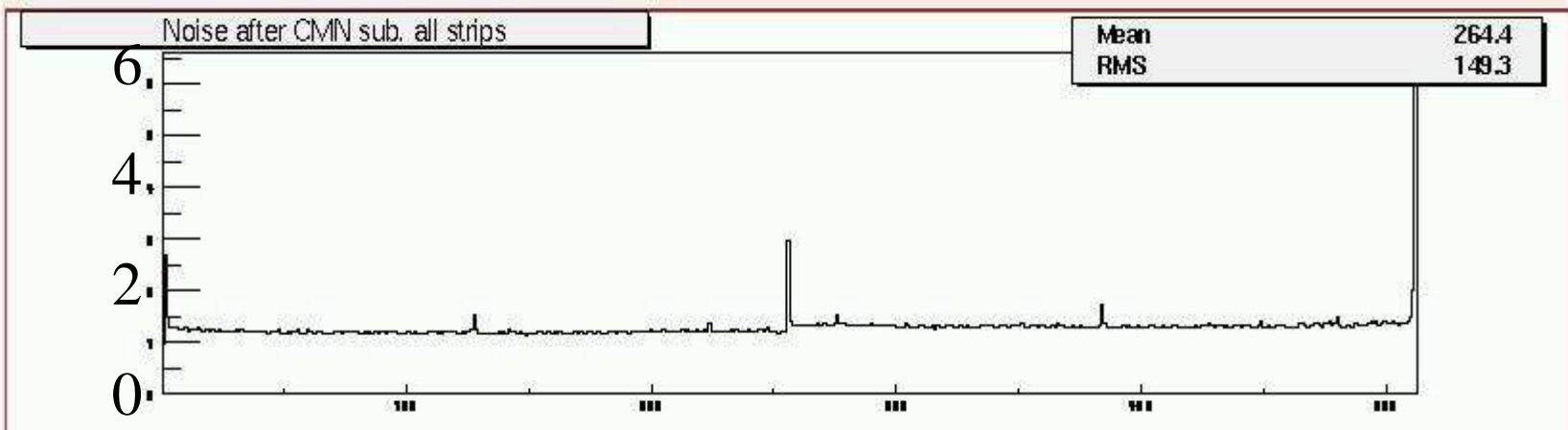
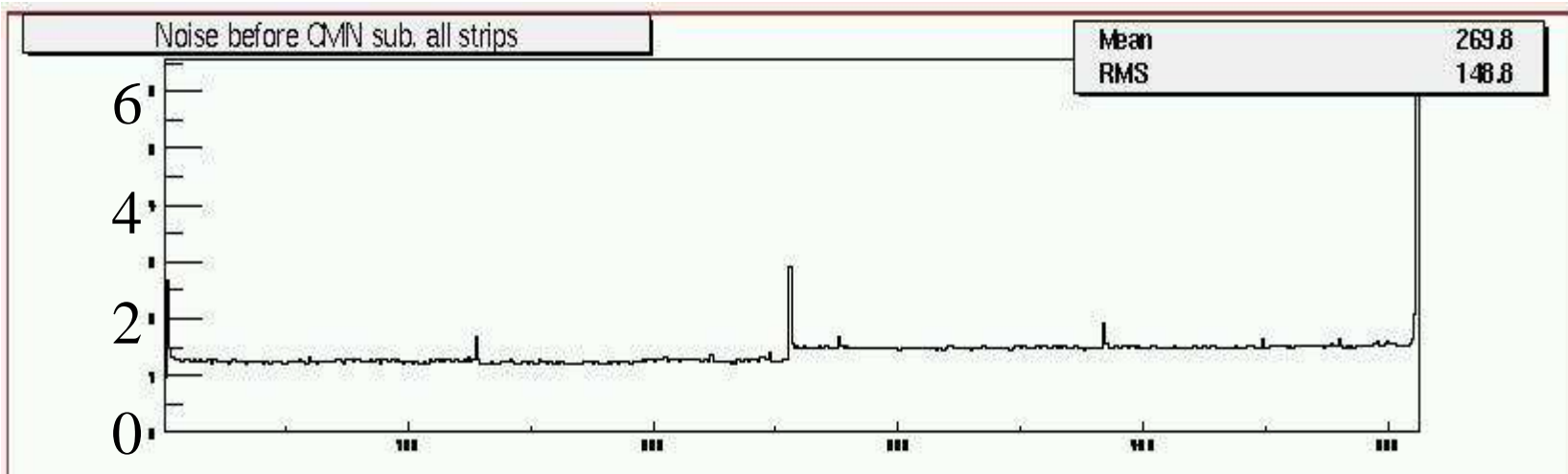
ERNI connector



Noise of FLEX Hybrid Module



TIB004(Bari) Peak mode, VUTRI, Lyon Software





Conclusions



- **Antwerpen Module Test Software tested successfully in Pisa but ROOT version not compatible with HybridDialog and Tracker DB matching did not work**
- **A new Client developed in Pisa based on ORCA-TT6 algorithm**
- **Average Noise Level Before CMN ≈ 4.5 (in both Peak & Deconvolution) using the VUTRI**
- **Average Noise Level After CMN ≈ 1.5 (Peak) ≈ 2 (Dec)**
- **First & Last 2-3 strips of the Module always noisy**
- **In some labs intermediate APV edges seen to be noisy**
- **CM under control using the new VUTRI adaptor (related to the Short Kapton Tail hybrids)**
- **Work in progress accumulating more statistics**