Module Test Status

Status of SW

- NEW! ARC 7.0 release end of next week, DB compliant, see Michael's talk
- LT 1.21 released in November
  - Root file compatible with ARCS one
  - DB interface to be finalized. In present LT sw xml file is filled but it is not correct due to a sw problem (pulse height fitting).
- Will they be in time for Production Data?
- ARC and LT sw team should provide tools to produce xml files for prod DB from root files taken with previous sw version

To Be Operational

- We will use present sw versions for both ARC and LT to qualify new production modules
- We store all root files
- As soon as DB parsers (as requested, see previous slide) are ready we will upload xml files to DB

Open Problems 1

- Open issues:
  - Cuts finalization and their integration in sw
  - Cuts variations between ARC and LT
  - Cuts are in the code, not in the parser: it has some impact if we need to change the cuts!
  - Optimization for tests at low temperature
  - Unexpected 10% change of noise in TOB modules with new hybrids: Tony will study the problem
  - D. Contardo raised problem of how to deal with modules produced up to now which cannot go into tracker (kapton cracks, no stiffener). Select by DATE seems viable, but then no more insertions of “old modules” in DB ?
- Still not clear who is taking care of all the above points!

Open Problems 2

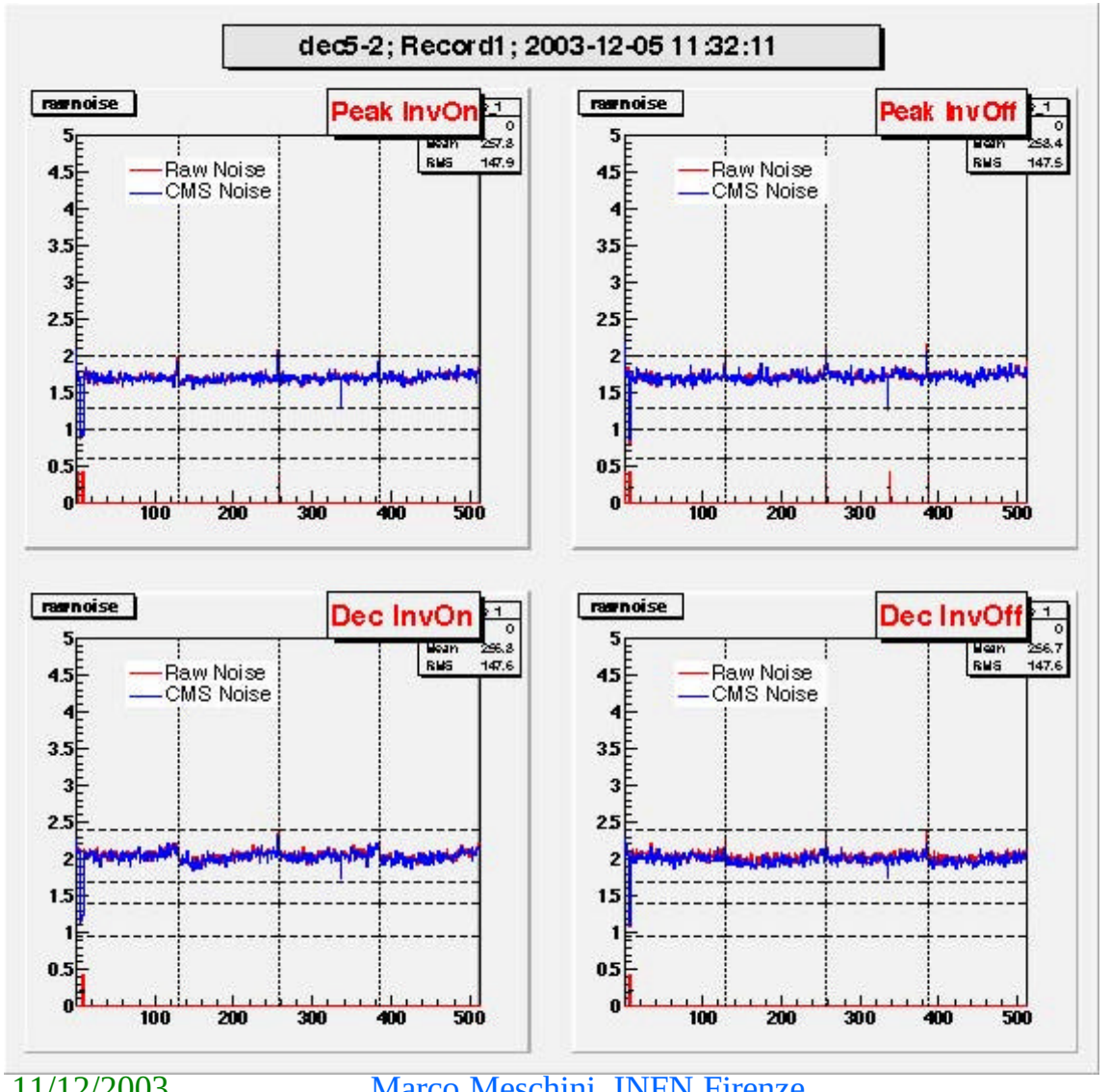
- CMN calculated using MEAN vs MEDIAN: recent experience shows everybody (TOB and TIB) is using mean in ARC.

Use MEAN as default mode

LT macro by P. Gartung

- Lt_macro : ARCS macro with modifications
- Removed pinhole finding test
  - No LED test for Wien cold box
- Removed unused test and plots
  - Gain scan
- Changes to histogram names
  - Name are compatible but change when opened
    - CMSubtractedNoise -> noise_1
- Changes to header variable names
  - Info about test time, test center, etc.
- http://hep.ucsb.edu/people/gartung/ltdata/plots/lt_macro.cc

Macro output: an example



LT HW Status with Vienna Boxes

- **UCSB is equipped for full Vienna box readout, 10 mod's**
- FNAL is equipped for 6, but now stopped due to problems on FEC/CCU (FEC broken ?)
- **5 TIB centers, out of 6, + Antwerpen are fully equipped with hardware to read out 6 modules**
  - Bari's waiting for K-Mux and electrometer, but Wien box and basic LT tests are running smoothly
  - Padova is not using Ariella's electrometers to readout the module current; high resolution caen ps (2nA) !
- The mechanical setup:
  - finalized in US
  - in progress in TIB, finalized in PD and TO

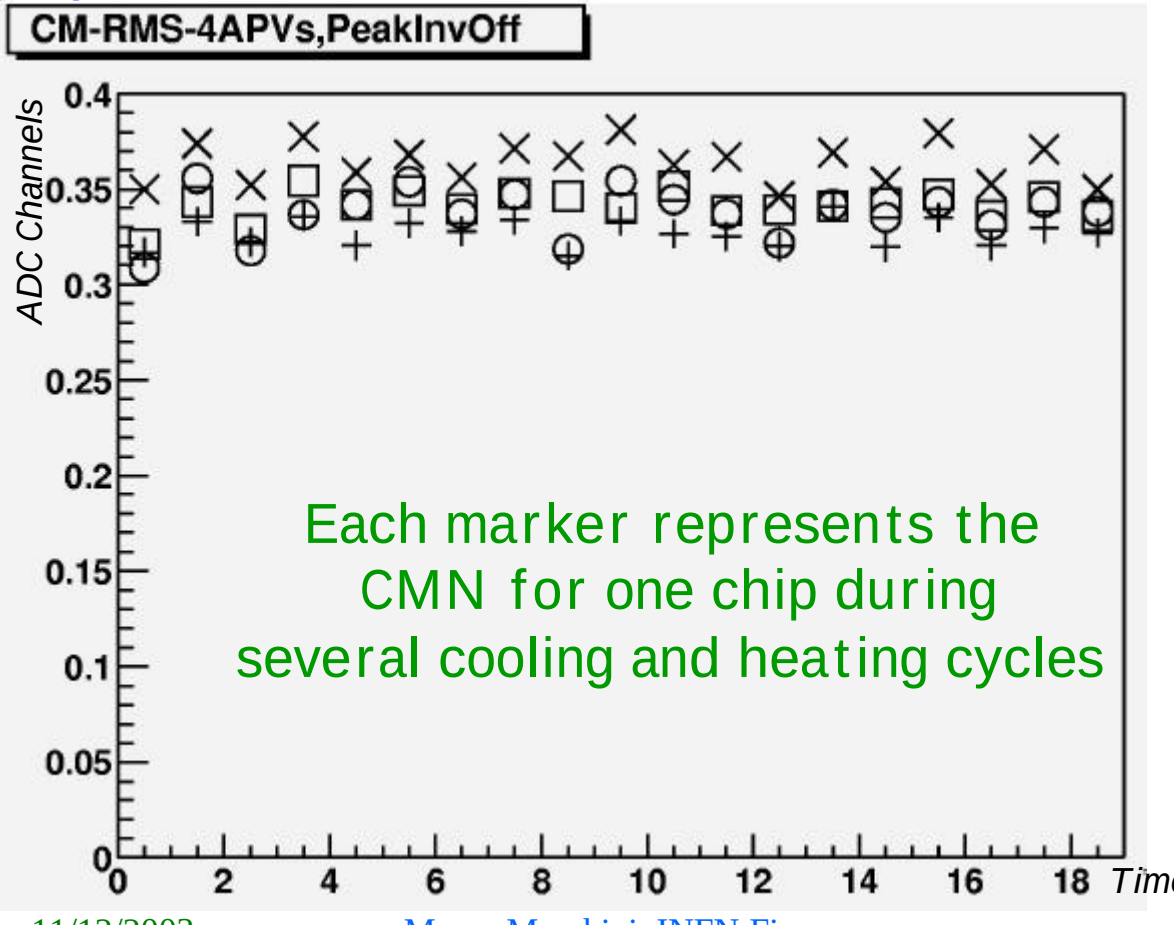
TIB LT Status

- All the centers are testing 6 (or 4) modules inside the Wien boxes. EVERYTHING WORKS!!!
- Hundreds of cooling hours accumulated with tens of modules
- Able to run any kind of scenarios and cooling cycles
- Very good results in terms of overall performance
- Up to now no defect has been reported on modules after a LT test! No unexpected problem

- READY to receive the new production modules

CMN Stability (TIB)

CMN appears to be stable during several cooling and heating cycles



Torino

Status of LT test - TOB

- UCSB cold box is fully operational
  - Few minor problems to be worked out
- Fermilab cold box will be fully operational by January
  - I will fly out in January to help out graduate student working with Wien cold box

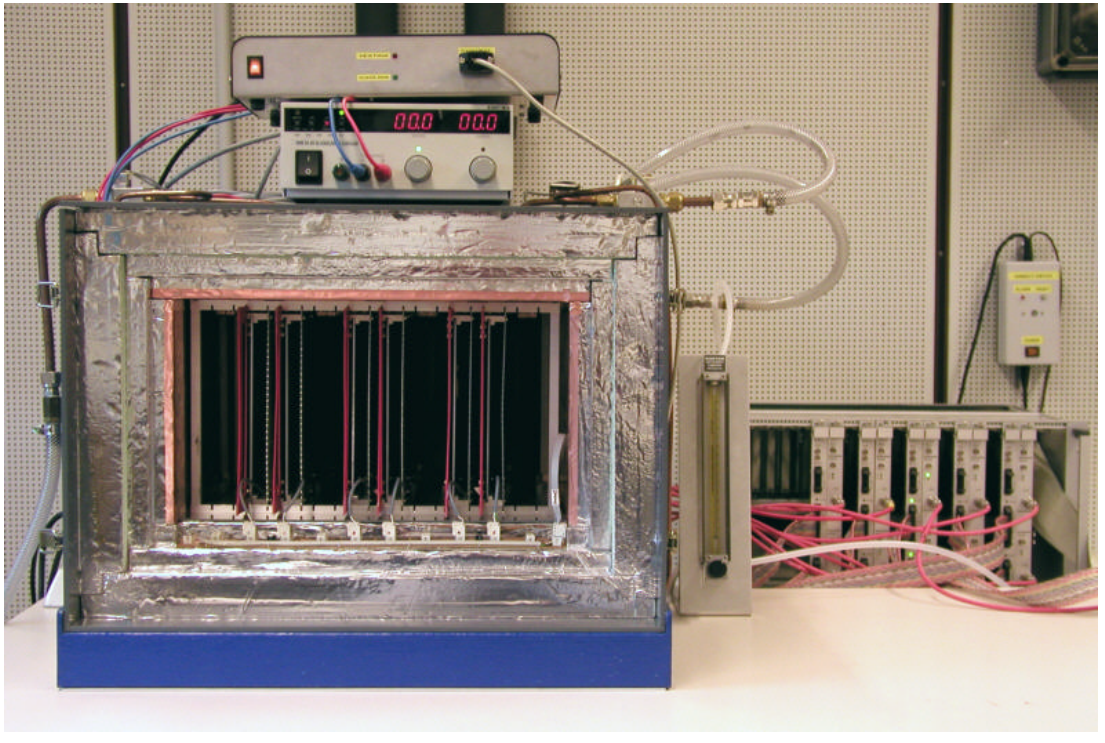
TOB LT: Noise at 400V Peak InvOff

	UCSB	Fermilab
Average noise	1.5 ADC	1.6 ADC
CMN	0.25-0.3 ADC	0.4 ADC
Chip edge noise	<2.0 ADC	<2.5
Leakage I @ 25C	800-2000 nA	NA
Leakage I @ -10C	200 nA	NA
Delta I @ -10C	>10 nA	NA

Long Term Stability in US

	UCSB	Fermilab
Control of DAQ/HV/Ileak/PAACB/ Wien Box in same run	Y/y/y/y/y	Y/y/n/y/y
# of modules	10	4
Low T on plate	-20C	-20C
# of cycles	3	3
Longest time in scenario	2 days	2 days
Longest time running one instance of Lt	4 days (4 1 day scenarios)	2 days(?)
Cause of crash	Mux failed to switch	?

TEC LT in Aachen IIIB



Slow Control

- Software ACDC
- RS232 Interface
- Monitor Temperature & Humidity
- Set Voltages
  - RS232 Slave

  or

  - DAC output
- Digital Output
  - Used to Control dry Gas Flow

Readout

- **5ARC Boards, 5DEPP Boards,10 ARC FE_M Adapters**
- **„non standard“**
- **No Multiplexer**

Preliminary TEC results on LT

- Cuts have to be evaluated
- Data will be analysed in more Detail soon
  - Presentation next Tracker Week
- Cold Box is operational

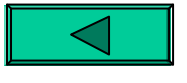
Other preliminarily Results:

- No additional Defects seen at cold
- No Microdischarge Effects seen on Pilot Run Modules (19)

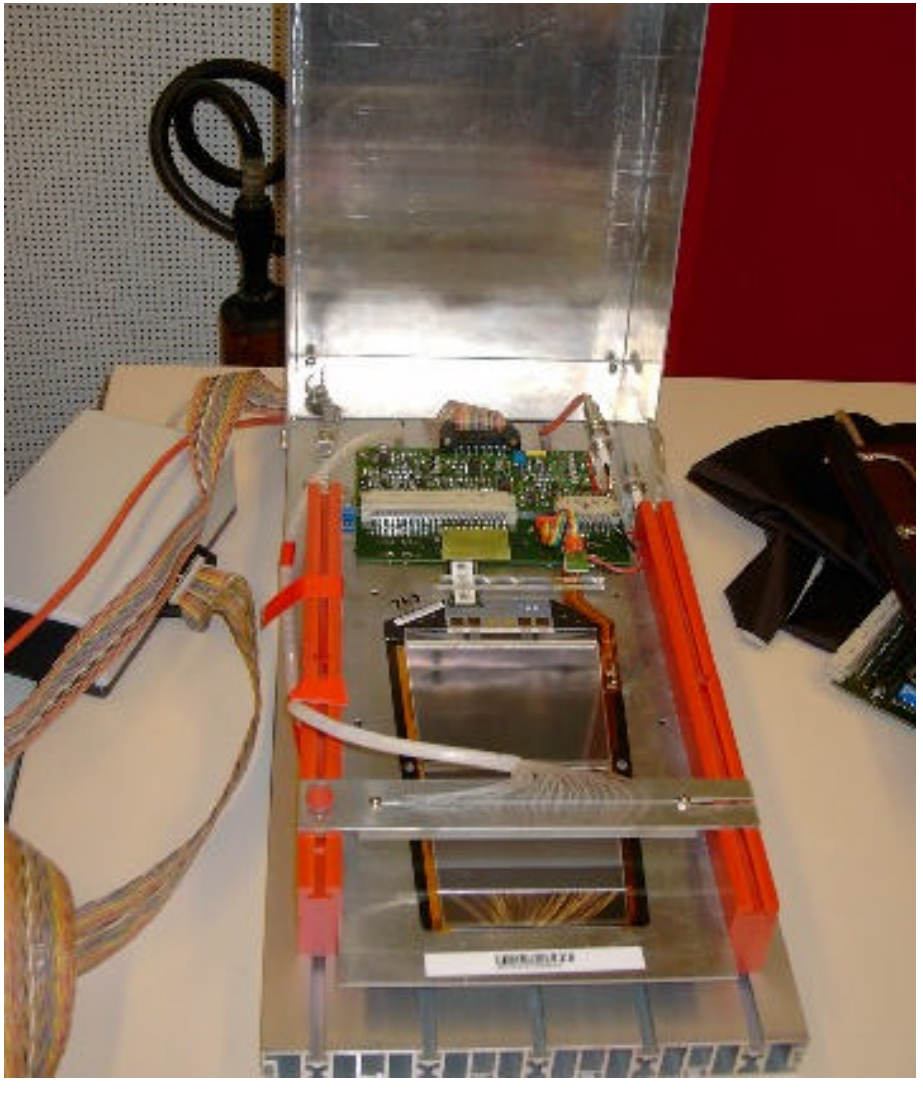
TEC ARC X-Calibration: Travelling Around

X Calibrated Centers up to now:

- AachenIB (Bonding Center)
- AachenIIIB (Integration Center)
- Brussels (Gantry & Integration Center)
- Karlsruhe (Bonding & Integration Center)
- Lyon (Gantry & Integration Center)
- Strasbourg (Bonding & Integration Center)
- Vienna (Gantry & Bonding Center)
- Zurich (Bonding Center)



TEC Cross Calibration – Test Setup



- All TEC centers where Module Test were done stayed below the Limit of less than 0.5 ADC Counts in Peak Ioff
- 0.5 ADC Counts CMN can also be reached in Dec Mode
  - Should be reached to see expected Behaviour of Opens
  - All TEC Institutes already reached this stronger Constraint
- Data has to be analysed in more Detail

Analyse TEC X-Cal Data

In the Module Test Working Group Paper we demand that the CMN in Peak Ioff Mode has to be less than 0.5ADC Counts.

- Check if this Limit is kept

Table of Common Mode in the Test Centers:
(Module 30200020015024 @400V)

Mode Center	Peak Ioff	Peak Ion	Dec Ioff	Dec Ion
1	0,3313	0,2844	0,5158	0,4122
2	0,3261	0,2762	0,5126	0,4129
3	0,4844	0,2751	0,8523	0,4177
4	0,3559	0,2801	0,5435	0,4239
5	0,3324	0,2872	0,5131	0,4212
6	0,3389	0,2863	0,5053	0,4244