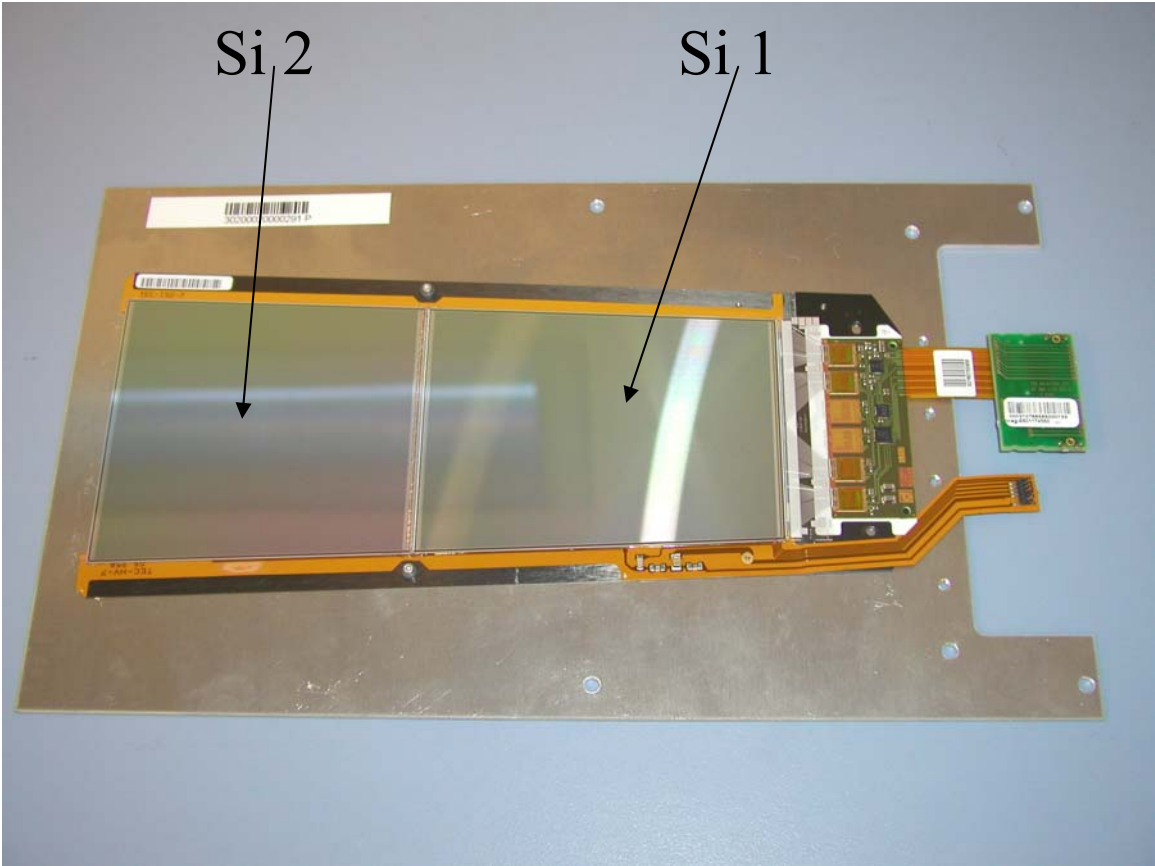


# R7 pilot run... ARC status

**IReS, GRPHE**

N. Dick, F. Didierjean, J.P. Ernenwein, R. Strub, P. Van Hove

# 18 modules received from Lyon



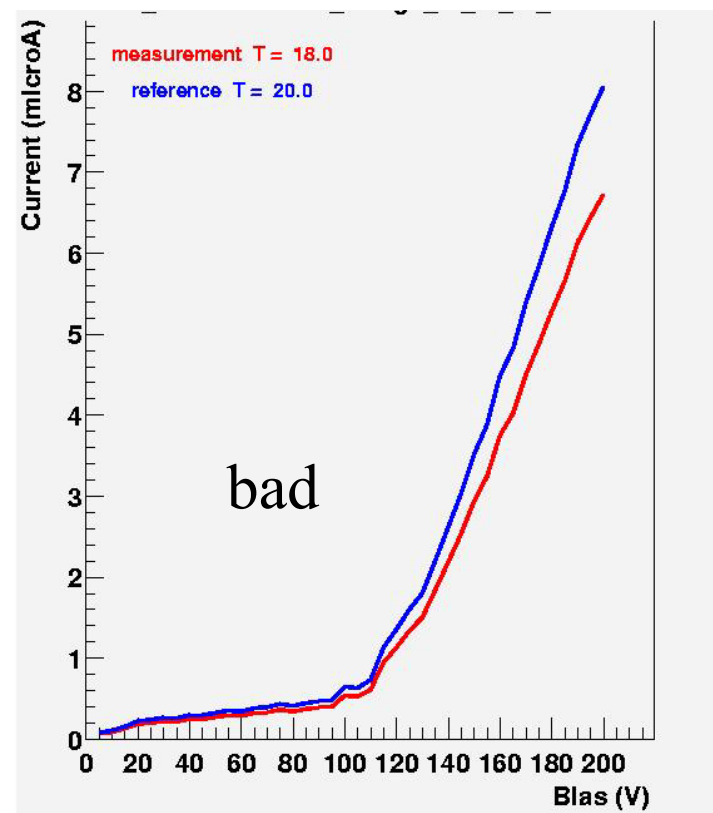
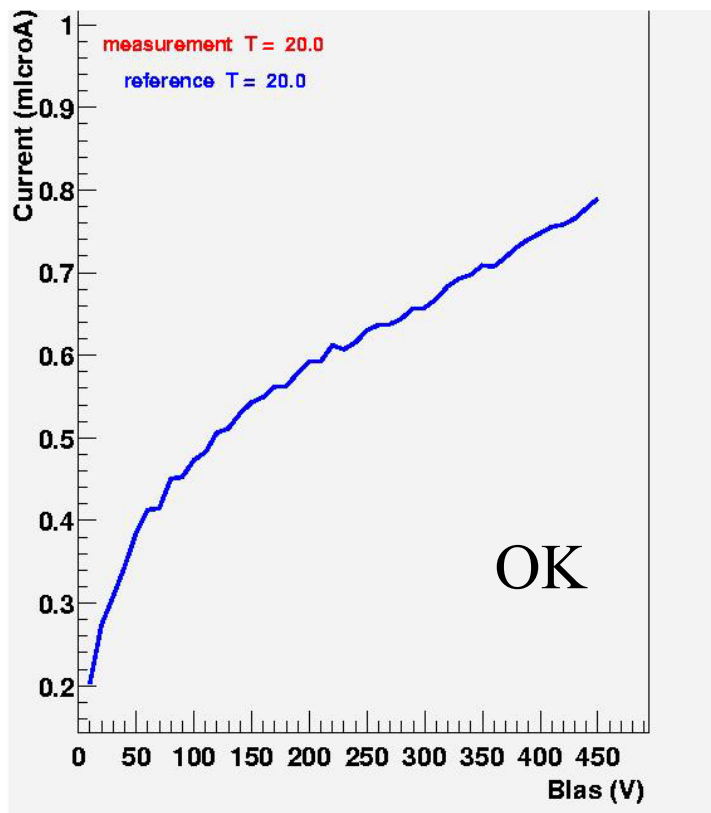
- 30200020000275
- 30200020000276
- 30200020000277
- 30200020000278
- 30200020000279
- 30200020000280
- 30200020000281
- 30200020000282
- 30200020000283
- 30200020000284
- 30200020000285
- 30200020000286
- 30200020000287
- 30200020000288
- 30200020000289
- 30200020000290
- 30200020000291
- 30200020000292

# I(V) Curves after bias line bonding

all OK except 2 bad modules :

current up to  $10\ \mu\text{A}$  at  $\sim 200\ \text{V}$  for ##281 module

current up to  $10\ \mu\text{A}$  at  $\sim 100\ \text{V}$  for ##291 module



# What Next ?

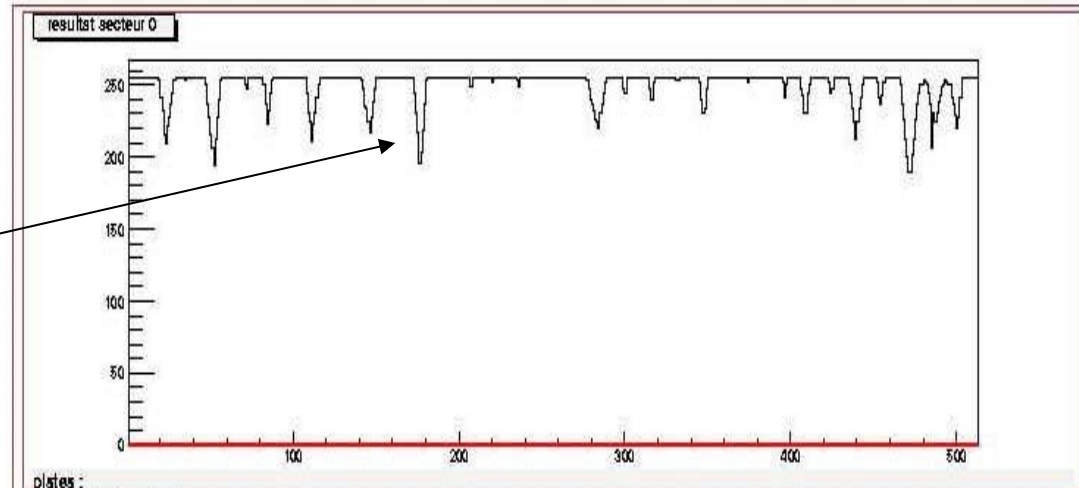
- ARC was not yet calibrated in Strasbourg
  - All modules tested with LED bench developed by J.P. Ernenwein.
- Five modules sent to Aachen for mounting on petals
- ARC grounding improved
  - Remaining modules tested with “standard” ARC
  - Results in DB ?

# LED Test “non standard”

Illumination of sensors at saturation by pulsed LED

**Sensor near hybrid**

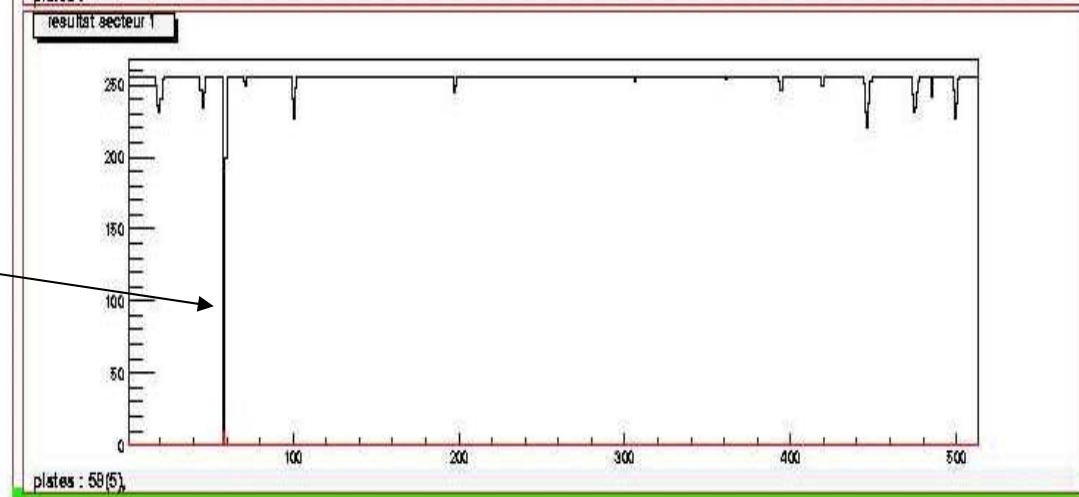
“Illumination holes”  
(I took the worst case)



**Sensor far from hybrid**

Unbonded

Also able to detect pinholes

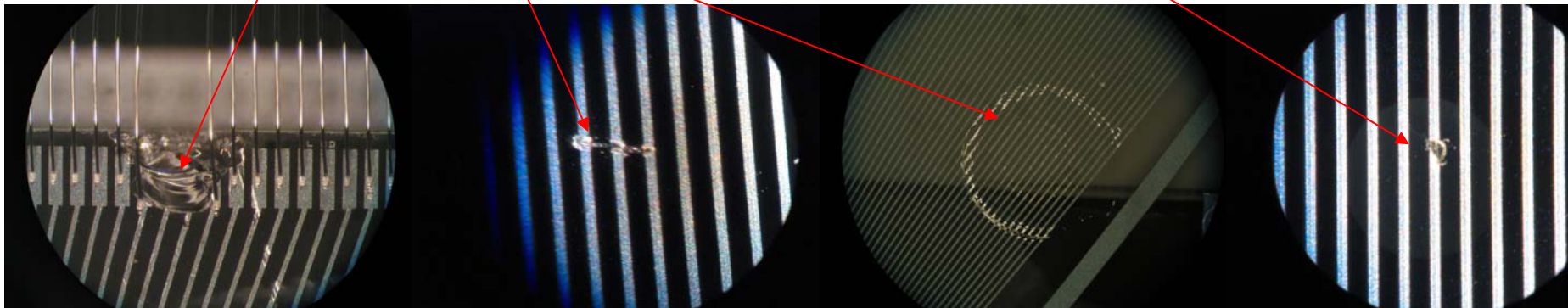


# Very good fault detection

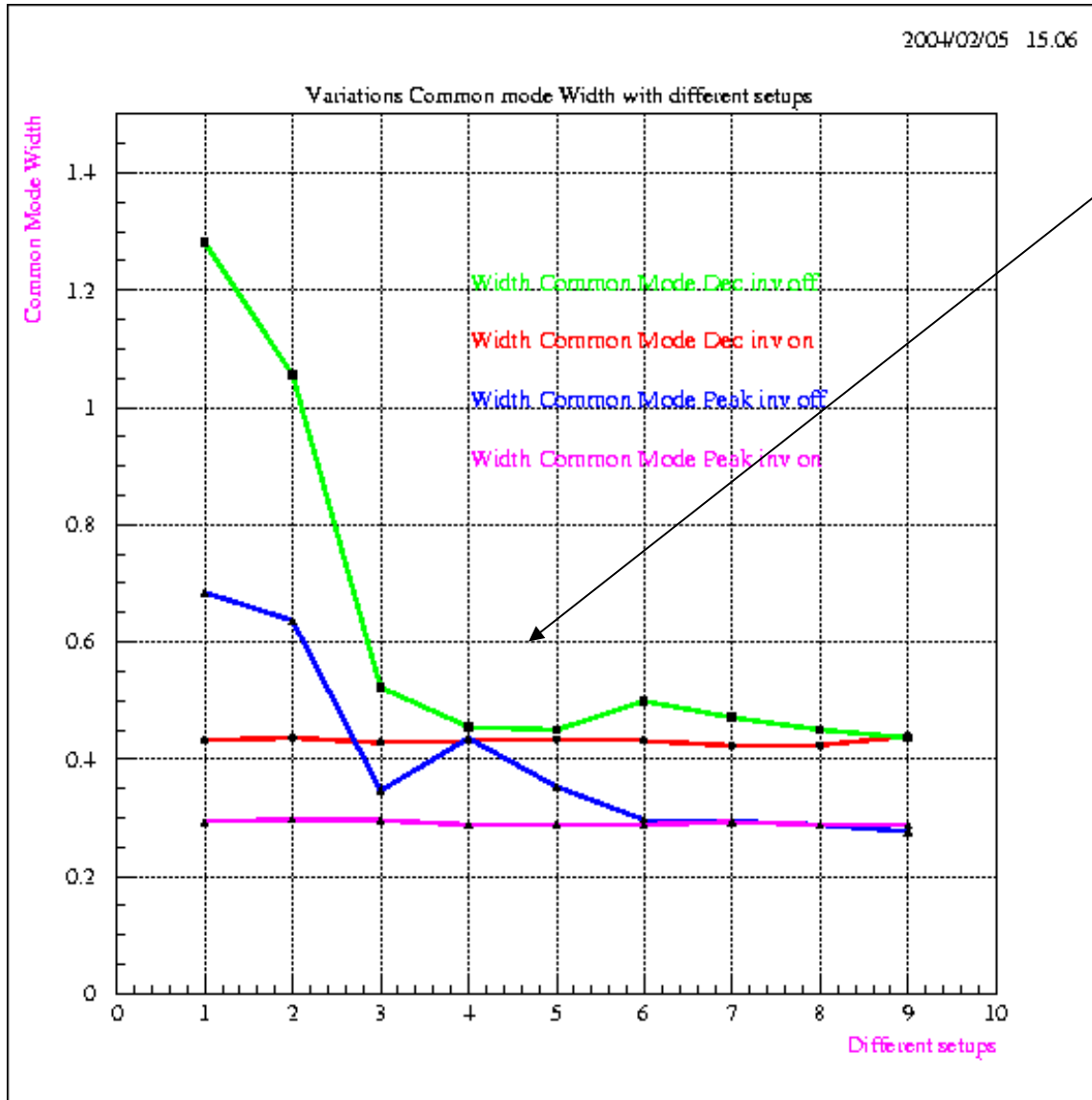
## LED results

## DB data from sensor group

	LED Si 1	LED Si 2	IDIEL Si 1	CAC Si 1	IDIEL Si 2	CAC Si 2
30200020000275	391 - 392 - 397 - 398	391 - 392 - 397 - 398	391 - 392 - 397 - 398	391 - 392 - 397 - 398		
30200020000276	396 -	396 -			396 - 439	396 - 439
30200020000277	-	-		20 - 21		130 -
30200020000278	-	-		18 -		
30200020000279	503 -	236 - 503	503 -	503 -		
30200020000280	468 -	468		351 - 354		468 -
30200020000281	bad IV curve					
30200020000282	-	-				
30200020000283	-	-				328 -
30200020000284	387 - 445	387 - 445			387 -	387 - 445 - 446
30200020000285	442 - 443	442 - 443		264 -		149 - 150 - 151
30200020000286	241 - 242	241 - 242		63 -		241 - 242
30200020000287	332 - 459	332 - 459	332 -	332 -	459 -	450 - 459
30200020000288	-	59 -		188 - 189 - 485 - 486		
30200020000289	4 -	4 -		55 - 56 - 57 - 58		4 - 301 - 320 - 321
30200020000290	52 - 430 - 445	52 - 430 - 445	328 - 430 - 445	430 - 445	52 -	51 -
30200020000291	bad IV curve					
30200020000292	204 - 205 - 288 from 495 to 512	204 - 205 - 288 from 495 to 512	288 - 508	90 - 288		229 -



# ARC Setup: Grounding Optimization



Evolution of CMN  
in the four modes with  
different grounding or shielding

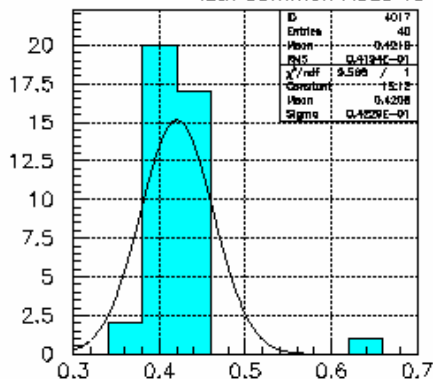
We understand very well  
the CMN behavior and  
we can say:

**Grounding and shielding  
are really well optimized**

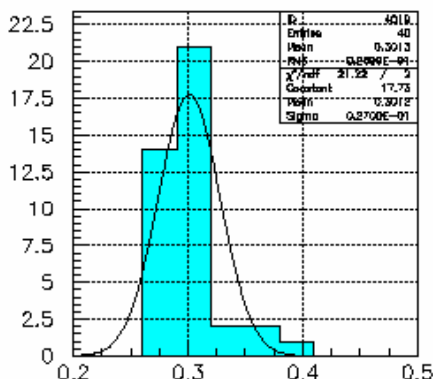
# CMN statistic

2004/02/05 15.18

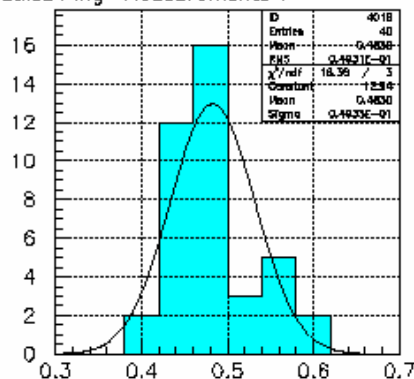
Width Common Mode 10 Modules Ring7 Measurements 1



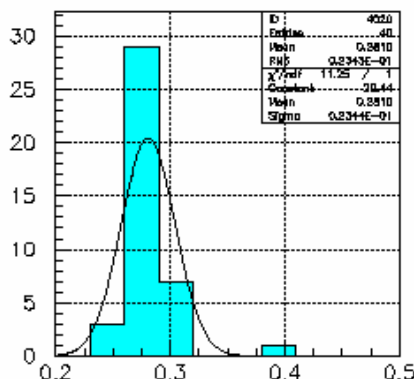
Dec Inv on all APV



Peak Inv off all APV



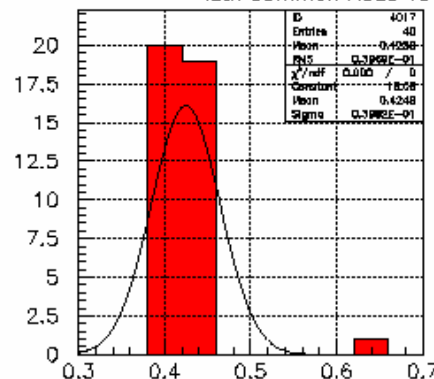
Dec Inv off all APV



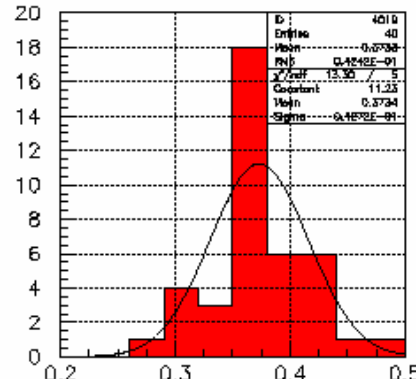
Peak Inv on all APV

2004/02/05

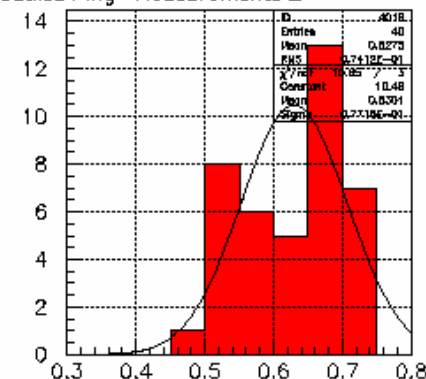
Width Common Mode 10 Modules Ring7 Measurements 2



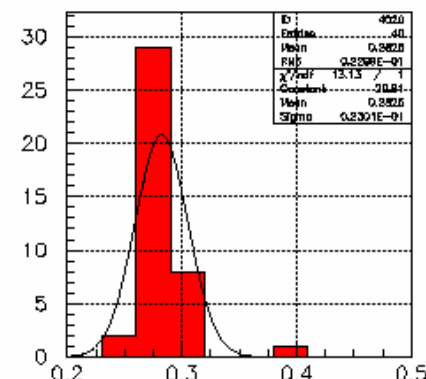
Dec Inv on all APV



Peak Inv off all APV



Dec Inv off all APV



Peak Inv on all APV

After optimization

Three days later, no changes in the setu

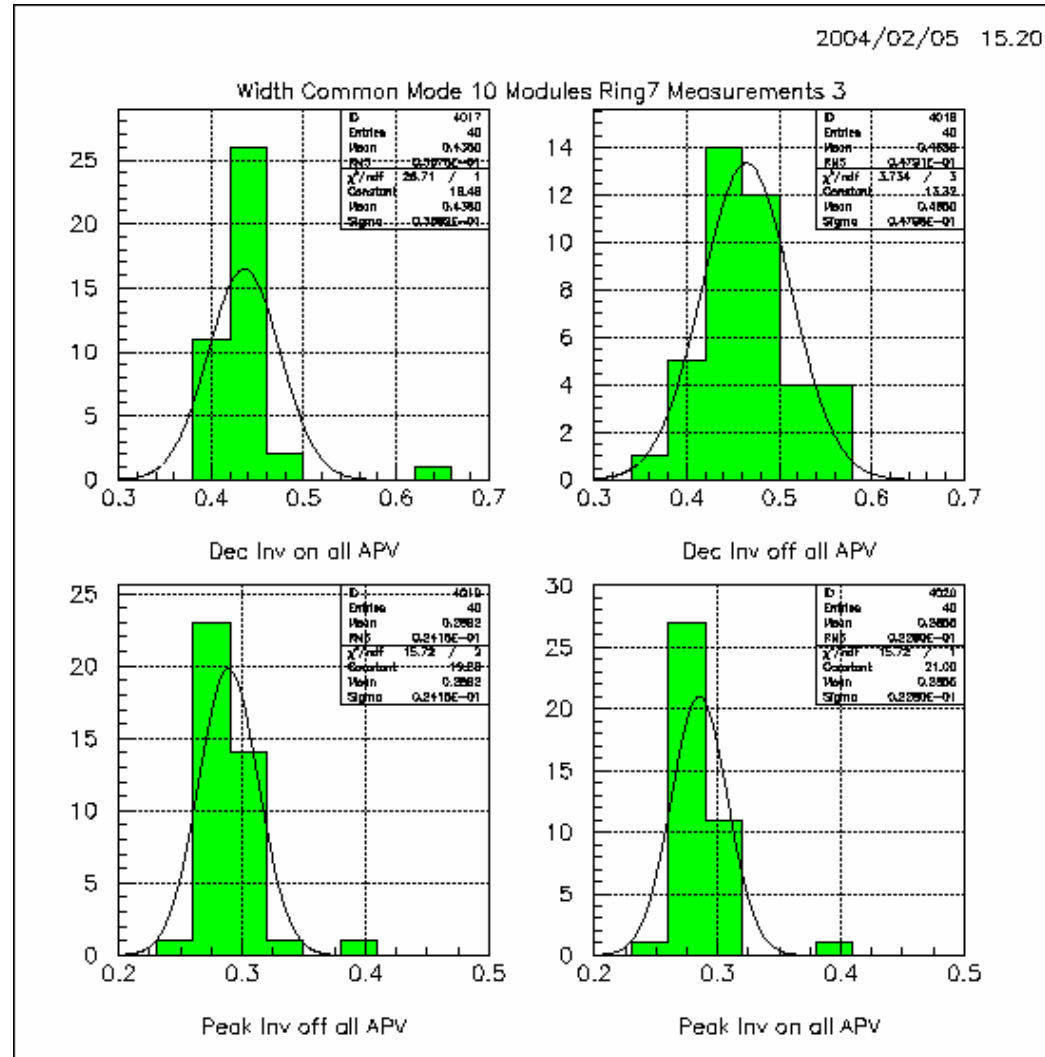
# CMN statistic... curing

- Lots of rain during the three days and modules not in controlled environment.

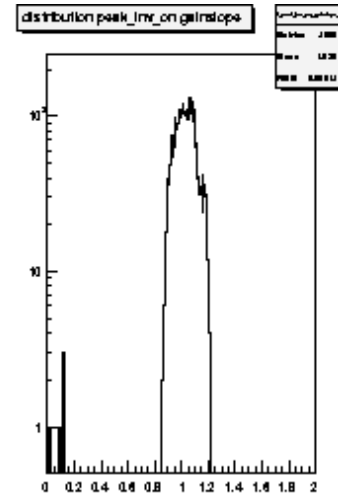
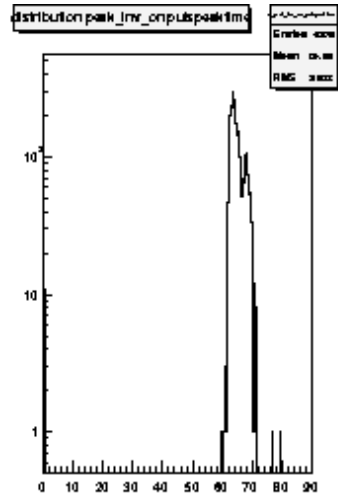
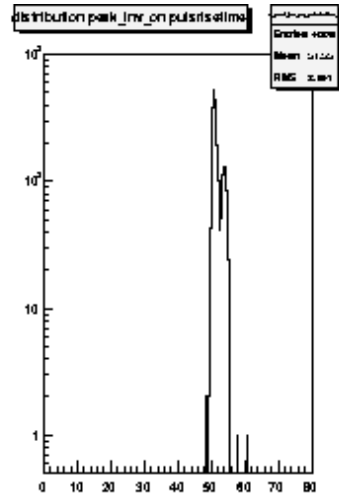
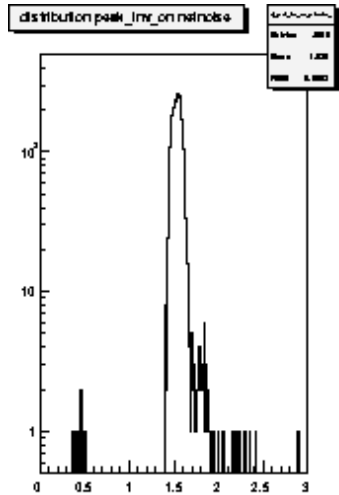
- One day dry air curing does not help,

- Three additional days and three thermal cycles lead back to original results... No new fault detected.

2004/02/05 15.20

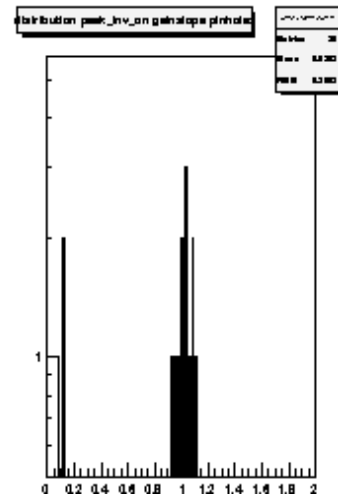
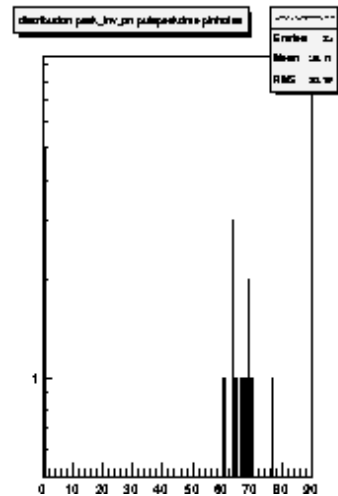
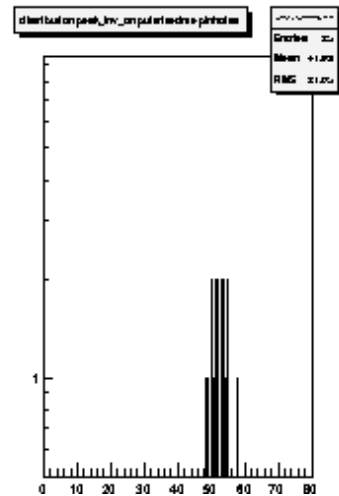
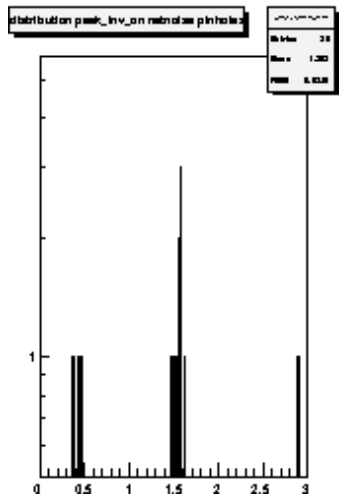


# Results with R7 modules...



Nice results,  
comparable with  
Aachen ones

BUT



**NO STATISTIC  
FOR DEFAULTS**

**LOT OF  
“FAULTY FOR  
UNKNOWN  
REASON”**

Noise

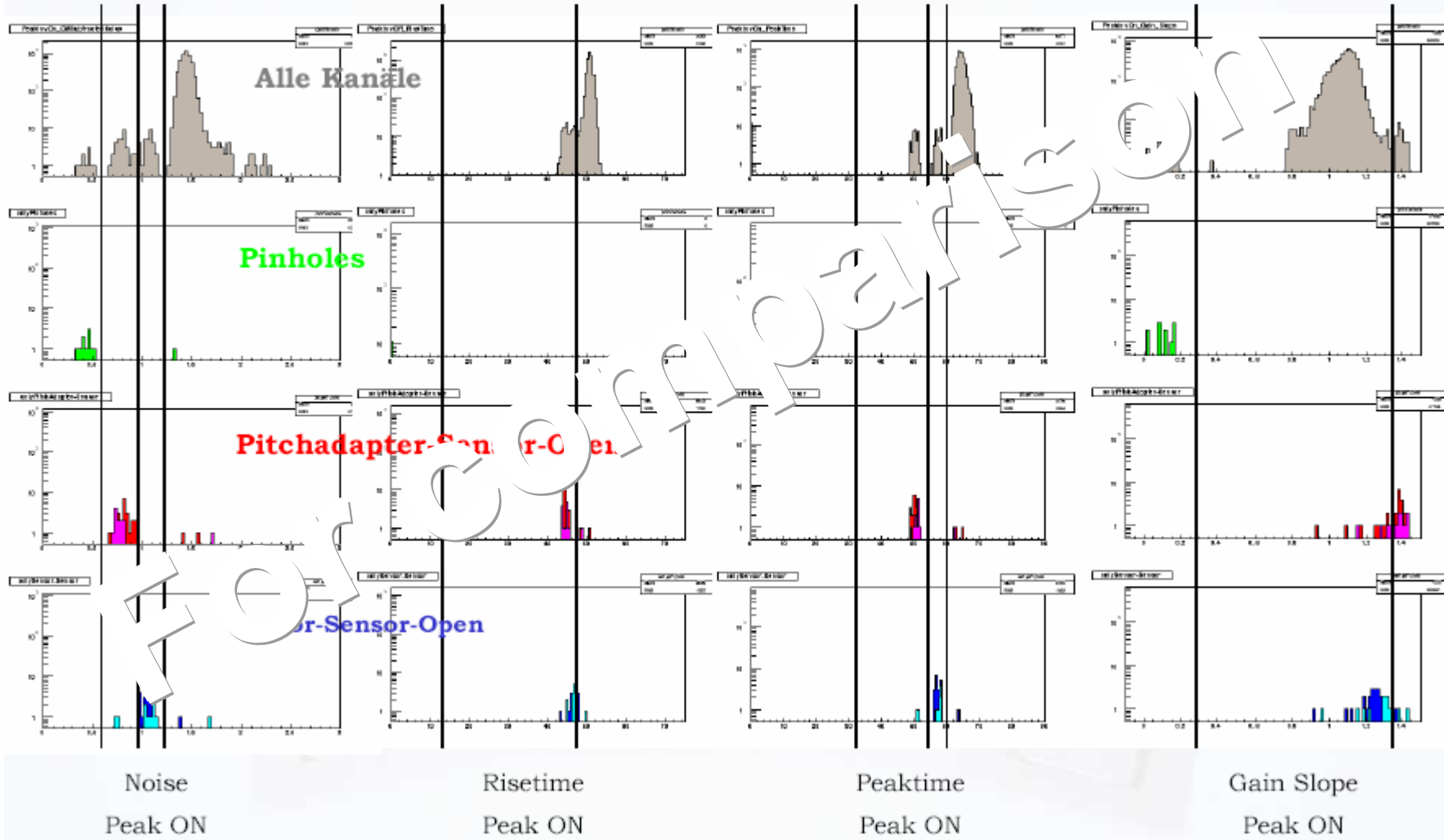
Risetime

Peakttime

Gain Slope



# Preliminary Results TEC Pilot Run Ring 6



# Conclusion

- LED bench works very well (48/49 faults)
  - Optimized ARC Setup gives good fault diagnosis, agreement with DB and LED
- but...**
- Lot of « Faulty for Unknown Reason »
  - Need for better cut values
    - Get higher fault statistic (introduce known defaults on R7 modules)
    - Help from ARC people ?