



DHCAL BEAM TEST @CERN

I.Laktineh
IPNL

Aims

- Test a mini DHCAL with new generation embedded electronics readout in beam conditions for the first time
- Have a better idea of the detector behaviour
- Start to study pions behaviour in the DHCAL
- Test new GRPC detectors and compare them with the standard ones

PS Operation

Period 3 2008 Jul 10 to Aug 14

Schedule issue date: 2-September-2008 Version 1.8

(colour code: purple (dark) = scheduling meeting , light green (light) = weekend or holiday)

		Thu 10 Jul	Fri 11 Jul	Sat 12 Jul	Sun 13 Jul	Mon 14 Jul	Tue 15 Jul	Wed 16 Jul	Thu 17 Jul	Fri 18 Jul	Sat 19 Jul	Sun 20 Jul	Mon 21 Jul	Tue 22 Jul	Wed 23 Jul	Thu 24 Jul	Fri 25 Jul	Sat 26 Jul	Sun 27 Jul	Mon 28 Jul	Tue 29 Jul	Wed 30 Jul	Thu 31 Jul	Fri 1 Aug	Sat 2 Aug	Sun 3 Aug	Mon 4 Aug	Tue 5 Aug	Wed 6 Aug	Thu 7 Aug	Fri 8 Aug	Sat 9 Aug	Sun 10 Aug	Mon 11 Aug	Tue 12 Aug	Wed 13 Aug	Thu 14 Aug		
Machine		BIG MD								MTE&HI CNGS																BIG MD													
EAST HALL	T7	8h M Glaser, N irradiation								8h FREE								8h M Glaser, N irradiation																					
	T8	8h L Nemenov																DIRAC																					
	T9	8h M Prest								CHIC								8h CALICE				8h FREE																	
	T10	8h I Laktineh								CALICE								8h EUDET/DEPFET																					
	T11	[REDACTED]																[REDACTED]																					
For further information contact the SPS/PS-Coordinator		Status:																																					

Remarks

SPS/PS-Coordinator: Emmanuelle Perez
 E-mail: SPS.Coordinator@cern.ch
 phone: 71915 (ext. +41 22 767 1915)
 mobile: 185758 (ext. +41 76 487 5758)
 - The indicated Machine Stops might not be up to date.
 Please consult <http://ab-div.web.cern.ch/ab-div/Schedules/schedule2008.pdf>

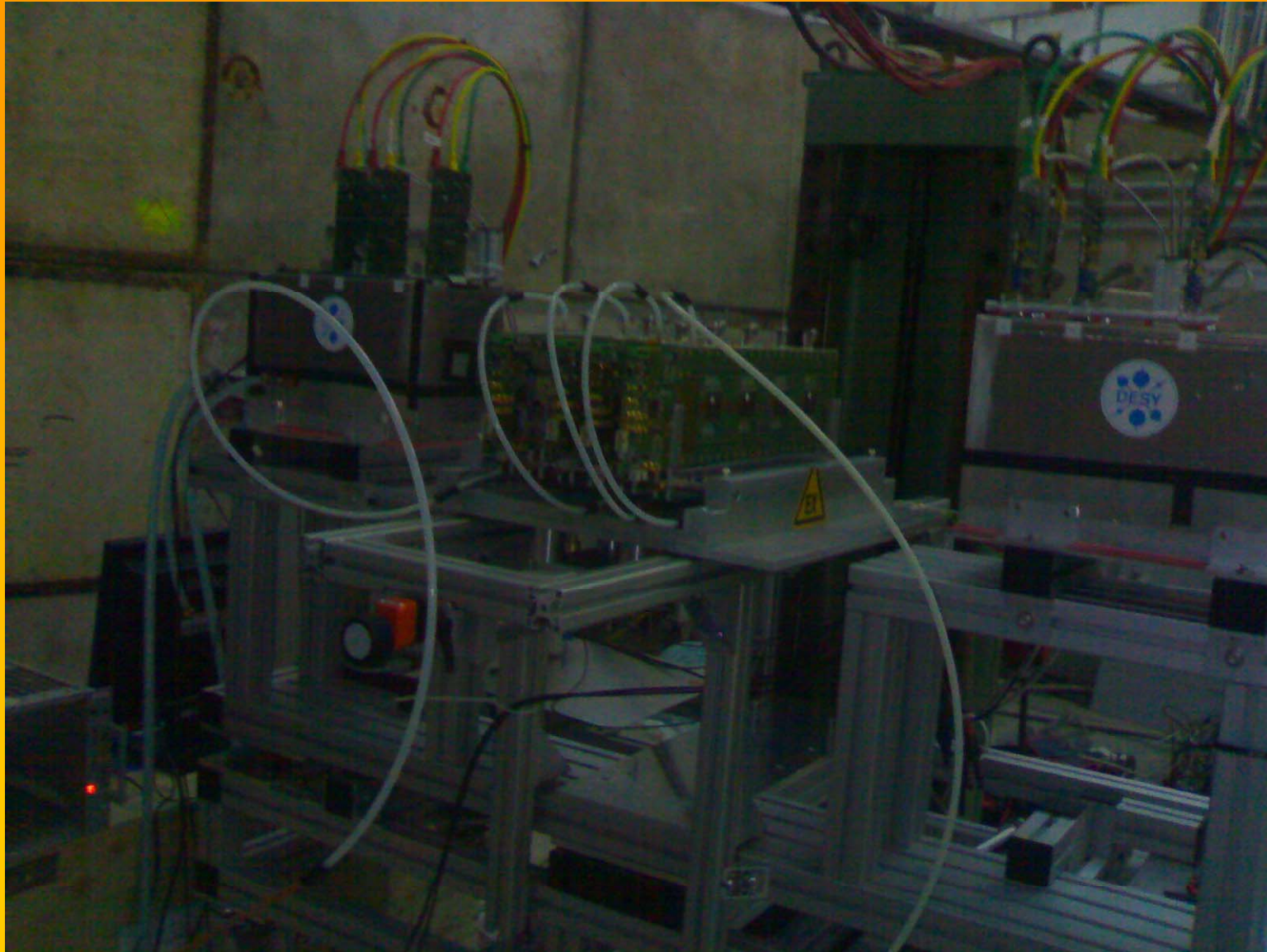
10 days with no beam because of ps magnet problem

Thanks to E.PEREZ (sps coordinator) our beam test from 10 to 17 July was extended to 25 July

Test @ps-T10



Test @ps-T10

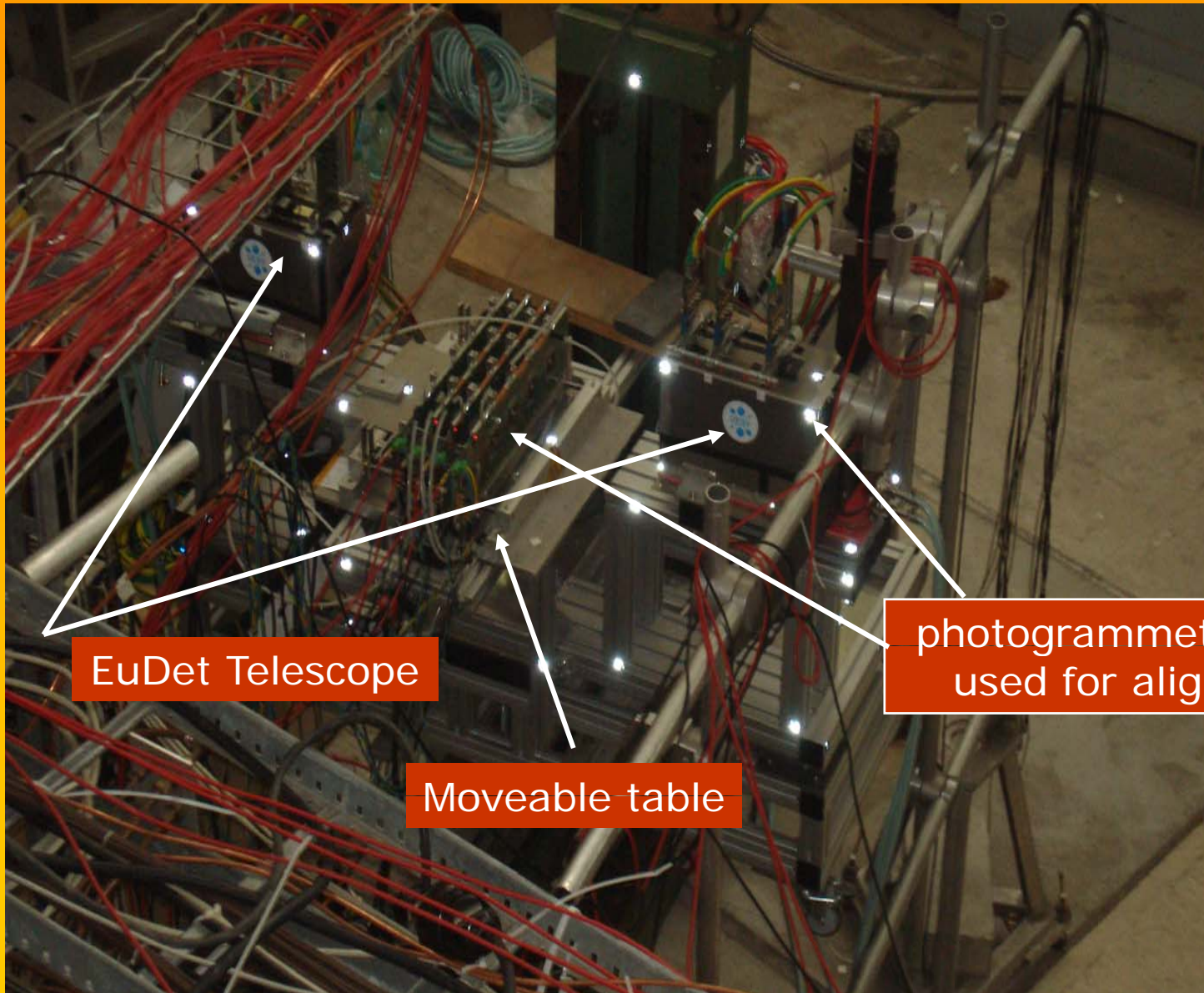


Test @ps-T10



I.Laktineh-IPNL

Test @ps-T10



EuDet Telescope

Moveable table

photogrammetric spots
used for alignment

Test with EuDET Telescope:

Aim : use the high precision provided by the telescope silicon detectors to study the GRPC inefficiency due to inter-pads and edges effect

The telescope is composed of two arms. Each is equipped with 3 silicon sensors ($7 \times 7 \text{ mm}^2$) size.

The precision expected in the middle of the telescope is less than 5 microns when the two arms are used

The telescope is equipped with a scintillator-pm trigger system



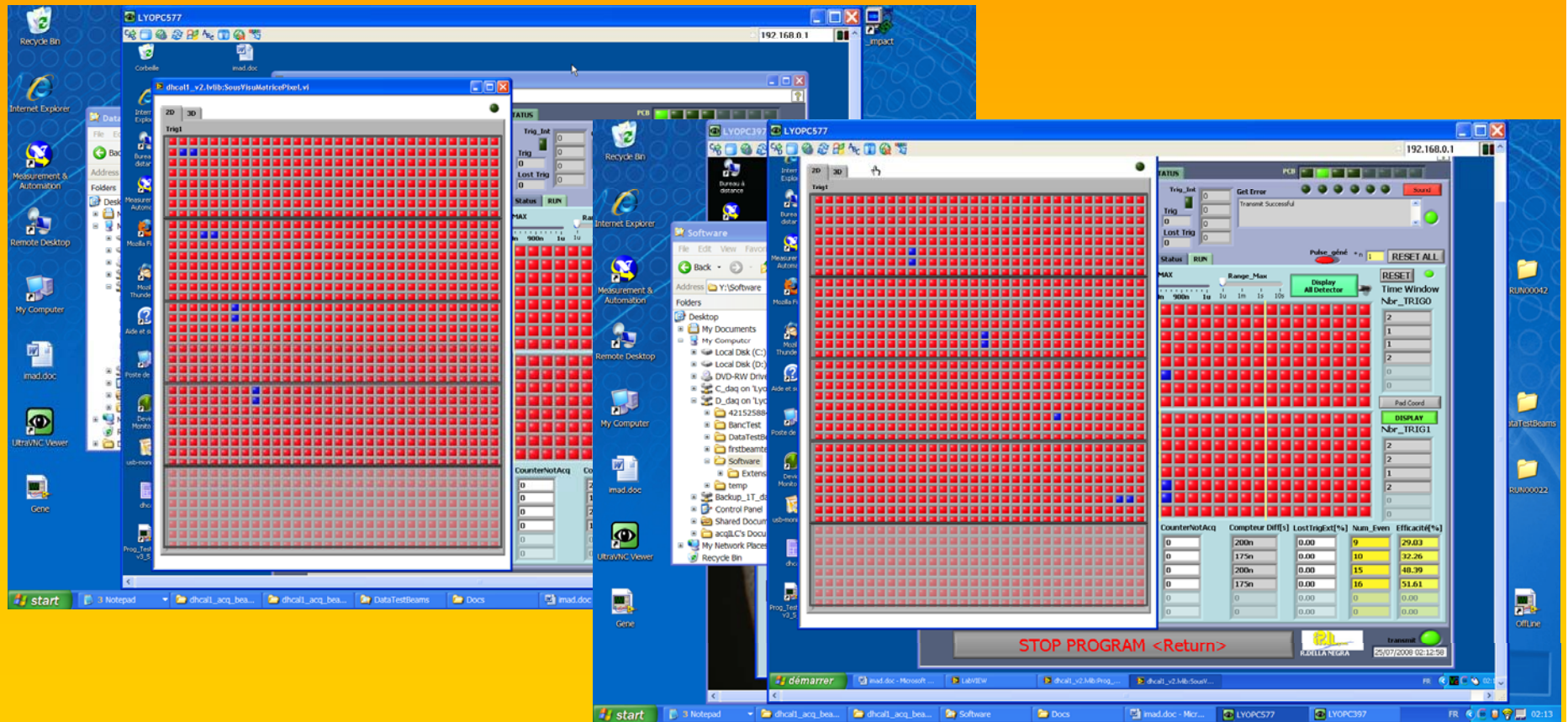
The touched pads in the 4 GRPC for 3 successive positions

Efficiency study (without Steel slabs) versus

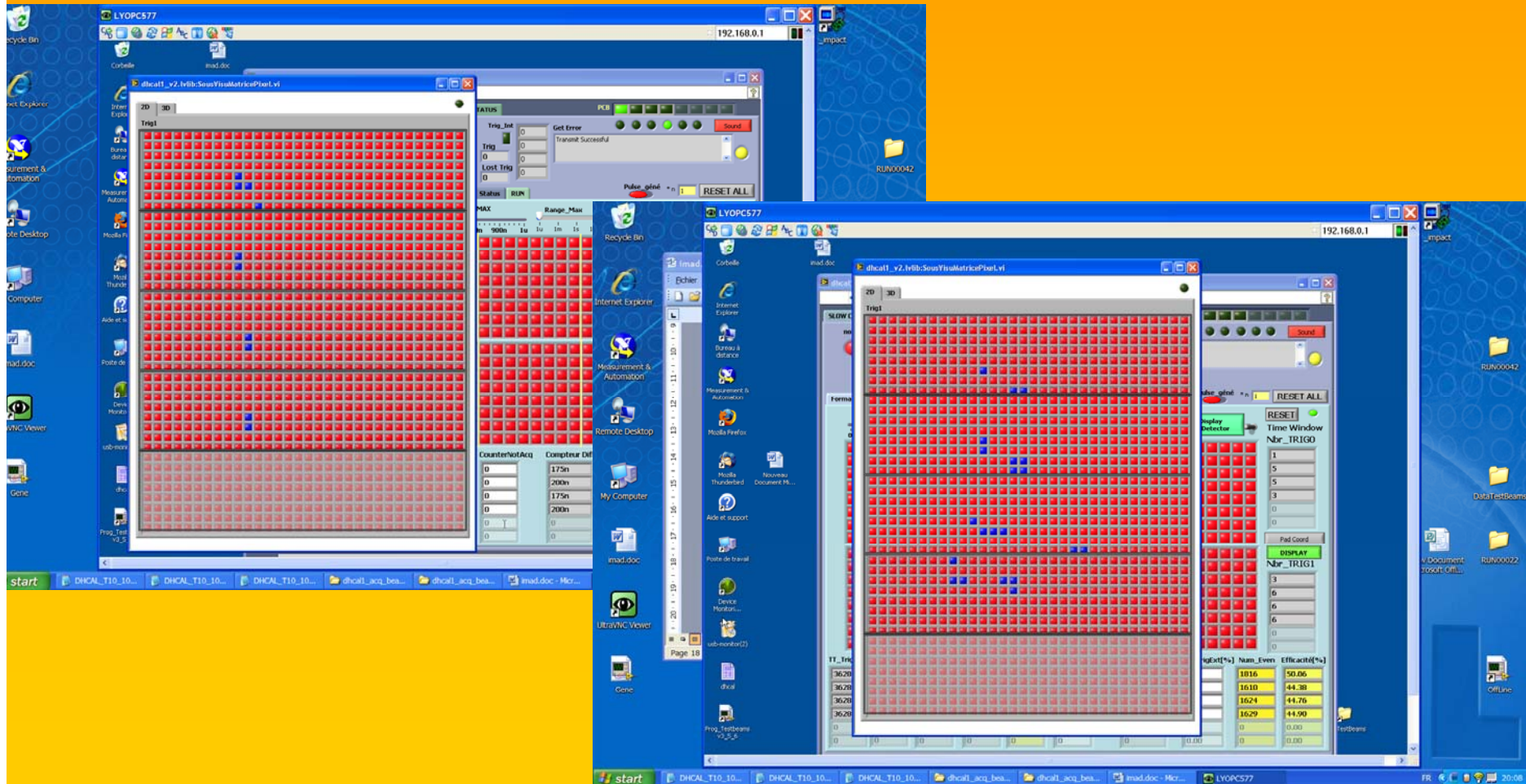
1- HV 6,6.5,6.8,7,7.2,7,4,7.6,7.8,8

2- Threshold 100 fc, 200 fc, 300 fc

3- Angles 0° , 15° , 30° , 45°



- # Mini DHCAL exposure to pions
- 1- Different absorber configurations
 - 2- Pion energy 3,5,6 GeV

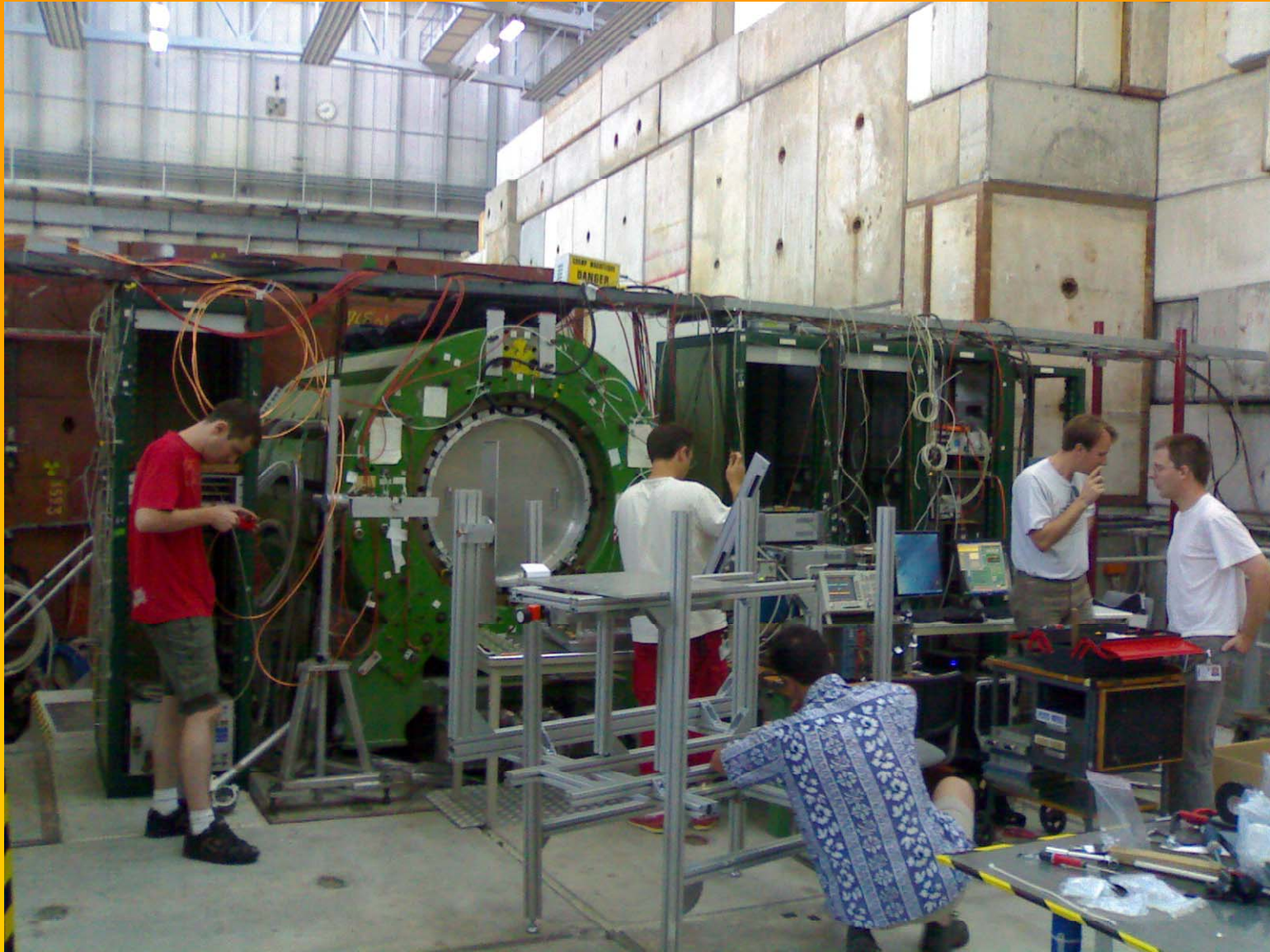


Two particles?

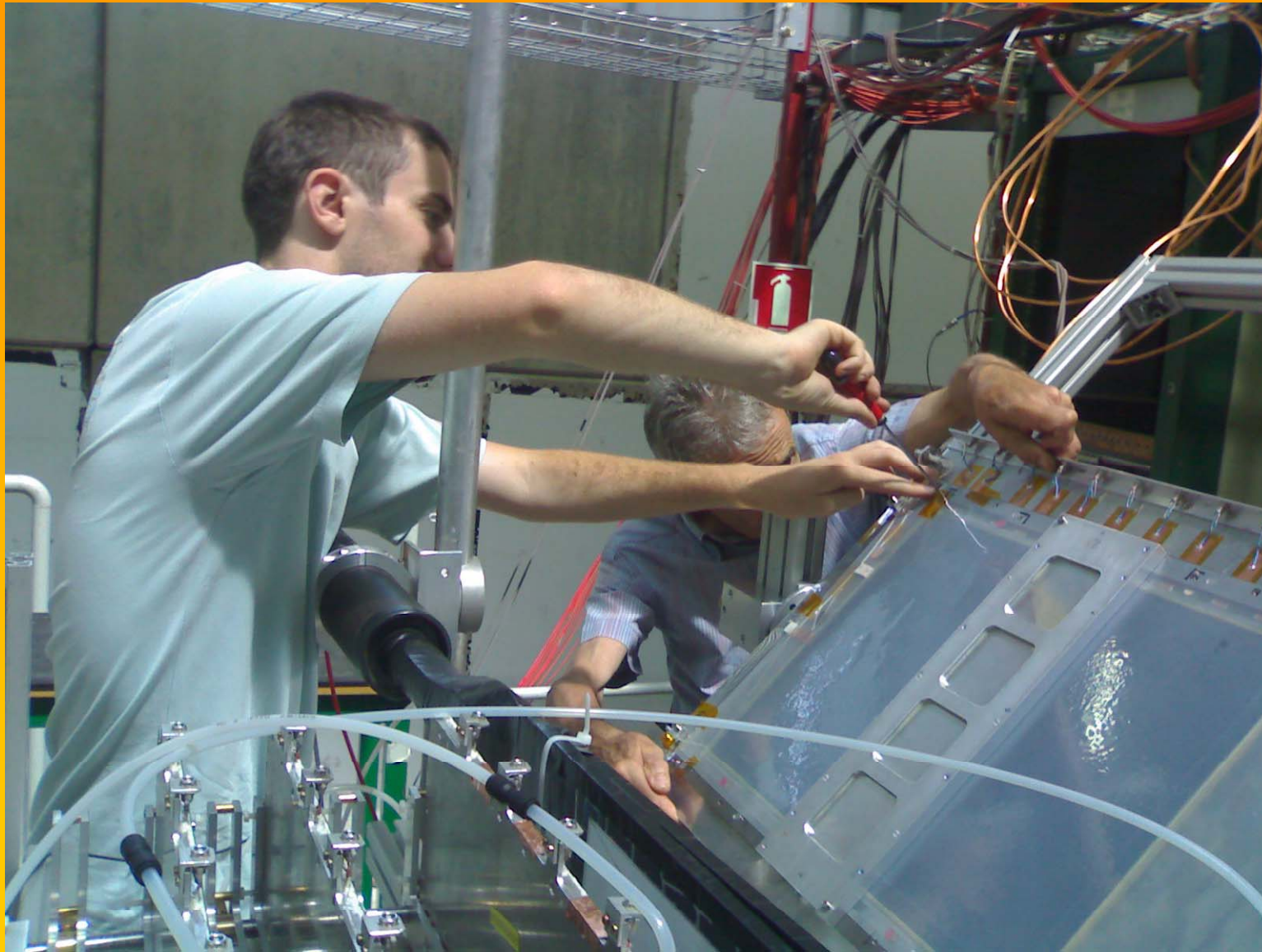
The screenshot displays a LabVIEW interface for a detector system. The main window shows a 2D grid of red and blue squares representing detector hits. A control panel on the right includes status indicators, a 'Display All Detector' button, and a data table. A 'STOP PROGRAM <Return>' button is visible at the bottom.

CounterNotAcq	Compteur Diff[s]	LostTrigExt[%]	Num_Even	Efficacité[%]
0	125n	0.00	90	81.82
0	100n	0.00	71	64.55
0	350n	0.00	95	86.36
0	17.075u	0.00	48	43.64
0	0	0.00	0	0.00
0	0	0.00	0	0.00

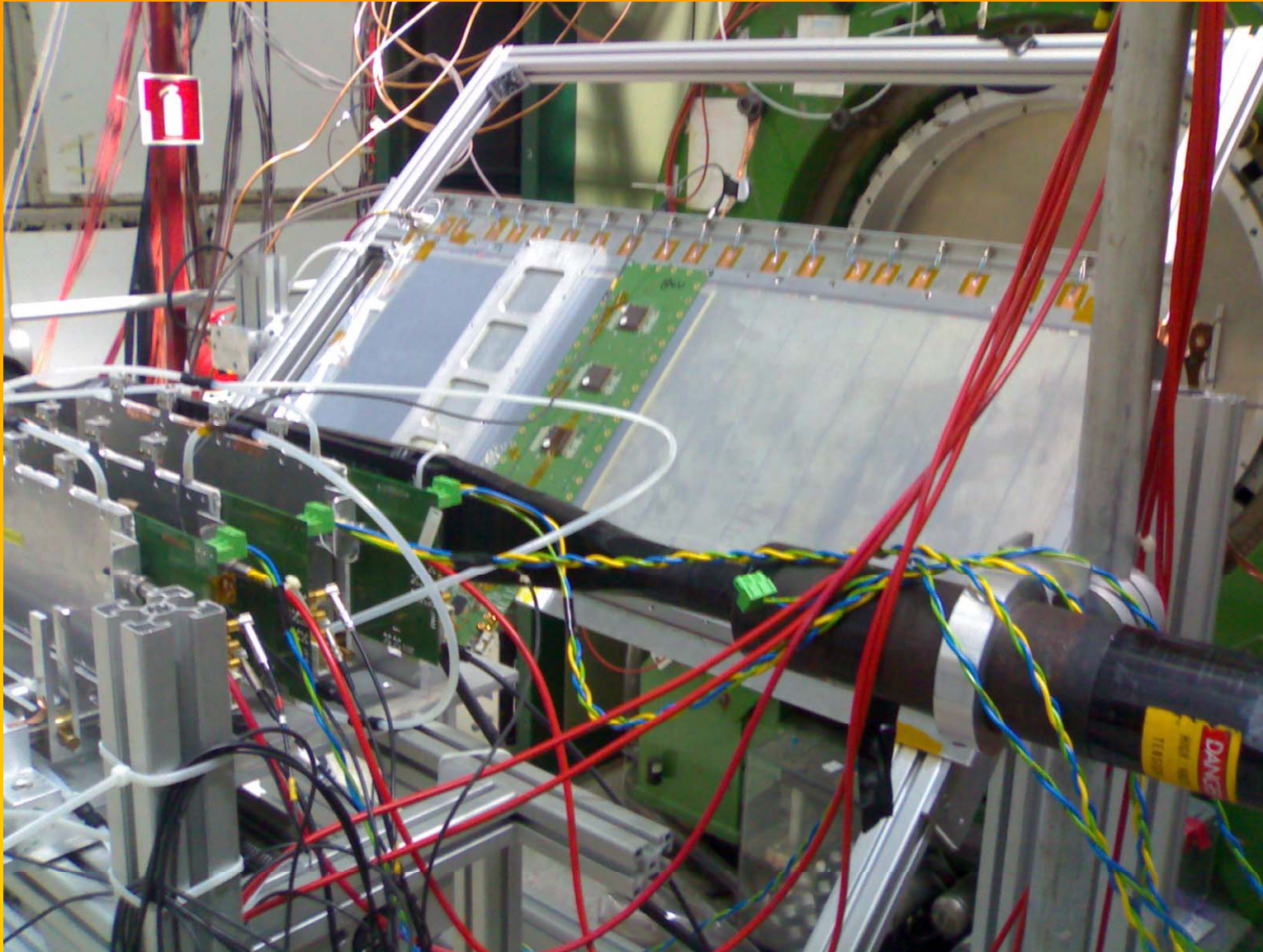
Test @ps-T9



Test @ps-T9

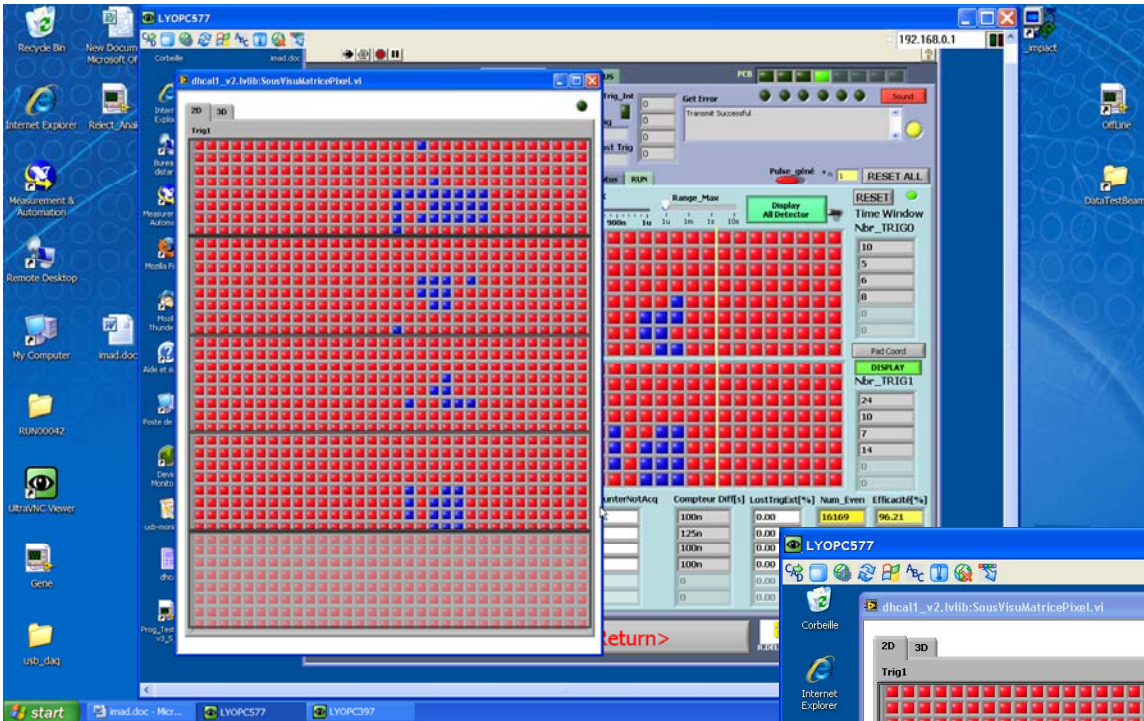


Test @ps-T9

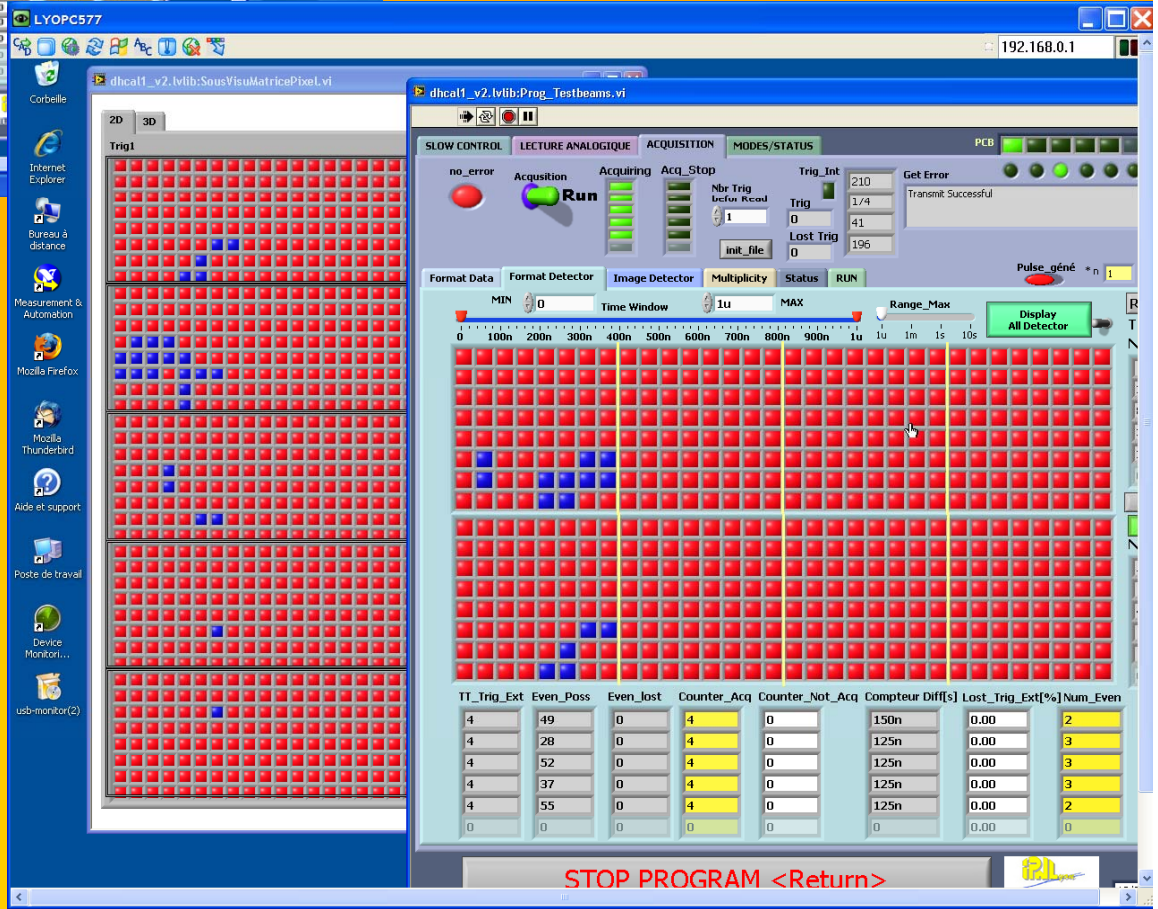


Planning@PS-T9 :

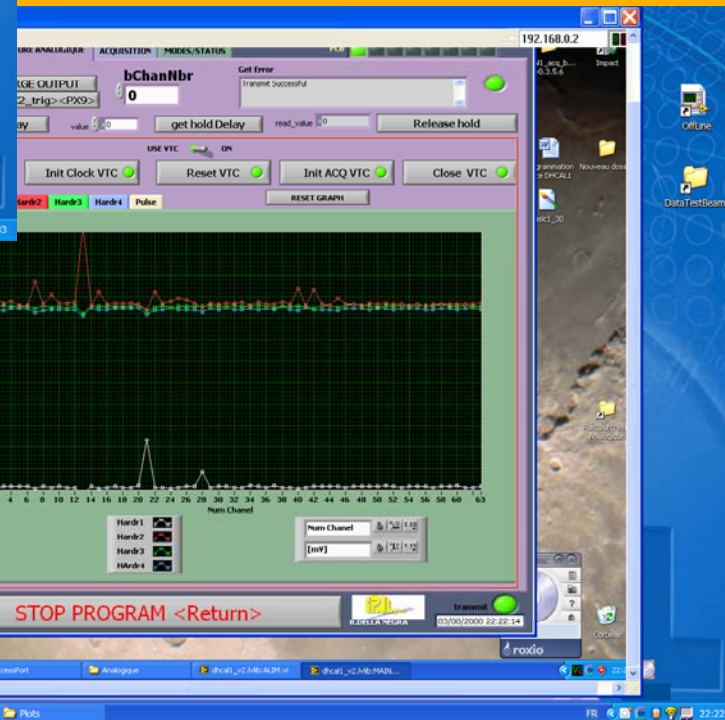
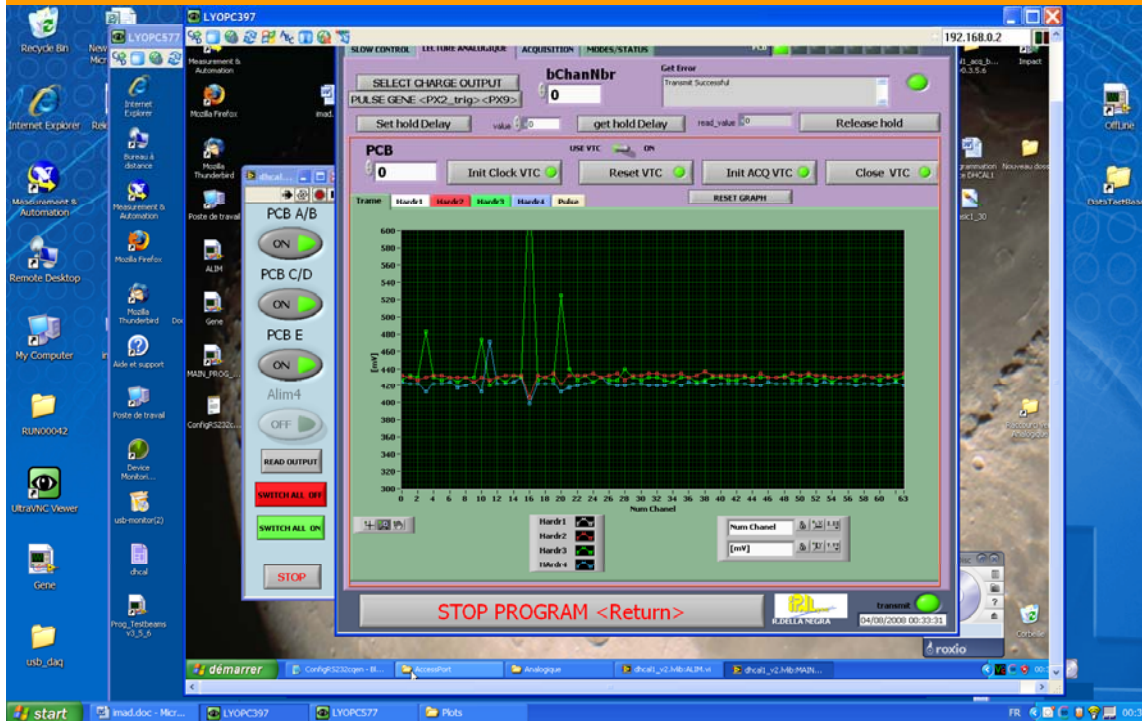
- Perform more measurements with pions up to 12 GeV
- Check the analogue readout
- Try the new detectors (different resistive paintings and gas distribution system) as well as large size detectors



With 2 cm Steel slabs and one λ I.L (Tungsten)



Analogue readout
(pions)



Conclusion

- The cern beam test was a real success and this thanks to the CERN technical staff and in particular E.Perez
- Collaboration with Eudet Telescope people was excellent
- We proved for the first time that the detector-embedded “new generation” electronics readout DHCAL is a reality
- We took a lot of good data
- We learnt a lot about our system: detector, electronics...

Perspectives

We obtained two weeks of beam

1 week at H8 (end of October)

1 week at ps9 (7-12 November)

We intend to test the large detector chambers with the appropriate electronics

The two weeks will be shared with other colleagues working on MICROMEAS development

We required one month beam test period at CERN for 2009

PS Operation

Period 6 2008 Oct 9 to Nov 12

Schedule issue date: 2-September-2008

Version 1.8

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		Thu 9	Fri 10	Sat 11	Sun 12	Mon 13	Tue 14	Wed 15	Thu 16	Fri 17	Sat 18	Sun 19	Mon 20	Tue 21	Wed 22	Thu 23	Fri 24	Sat 25	Sun 26	Mon 27	Tue 28	Wed 29	Thu 30	Fri 31	Sat 1	Sun 2	Mon 3	Tue 4	Wed 5	Thu 6	Fri 7	Sat 8	Sun 9	Mon 10	Tue 11	Wed 12	
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EAST HALL	T7	8h M Glaser, M Moll																Irradiation																			
	T8	8h L Nemenov																DIRAC																			
	T9	8h V Polyakov COMPASS-SHASHLIK								8h V Polyakov COMPASS-CALO								8h I Laktinec CALICE																			
	T10	8h P Martinengo ALICE-PHOS																8h A Di Mauro ALICE-FARICH																			
	T11																																				
For further information contact the SPS/PS-Coordinator																																					
Remarks SPS/PS-Coordinator: Emmanuelle Perez E-mail: SPS.Coordinator@cern.ch phone: 71915 (ext. +41 22 787 1915) mobile: 165758 (ext. +41 78 487 5758)																																					

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Machine		BIG MD								MTE&HI CNGS								BIG MD								END											
NORTH AREA	T2 -H2	8h NA61																8h CMS-HCAL R&D								8h CREAM											
	T2 -H4	8h NA63								8h RD22																8h LHCF											
	T4 -H6	8h ATLAS-DIAMOND				8h ATLAS-DIAMOND				8h ATLAS-DIAMOND				8h ATLAS-BCM				8h MEDIPIX				MONOPIX															
	T4 -H8	8h TOTEM				8h ATLAS-RP				8h RD42-At				8h Diamonds				8h GCprep				8h CALICE-TGC				8h ATLAS-3DSi-TGC											
	T4 -P0	8h A Ceccucci NA62								8h FREE								8h A Ceccucci NA62																			
	T6 -M2	8h G Mallot COMPASS																																			
-CNGS	8h Y Declais CNGS																																				
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