The European DHCAL status

CIEMAT,IPNL,LAL, LAPP,LLR, PROTVINO, SACLAY

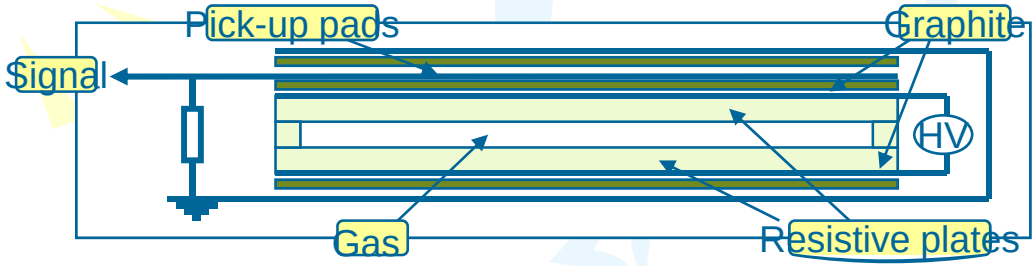
- Detectors study: GRPC,µMEGAS
- Electronics development : Semi-digital
- 4-chip board
- Beam test & prototype
- Funding

Imad LAKTINEH

GRPC development & characterization

GRPC : IHEP+IPNL (see Vladimir talk)

8X8 pads ok , 8X32 pads ok



Activities :

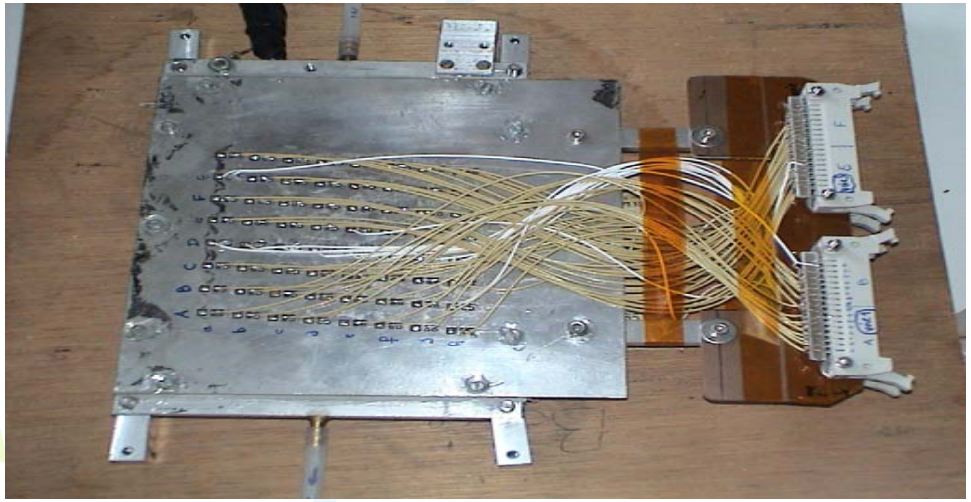
Efficiency vs multiplicity

Gas mixture (Isobutene->CO2)

important issue

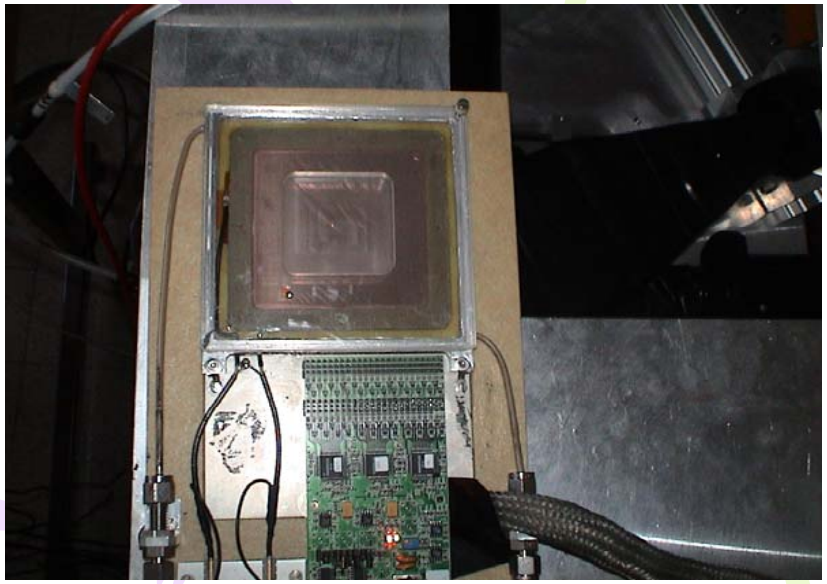
Conceiving, building and testing

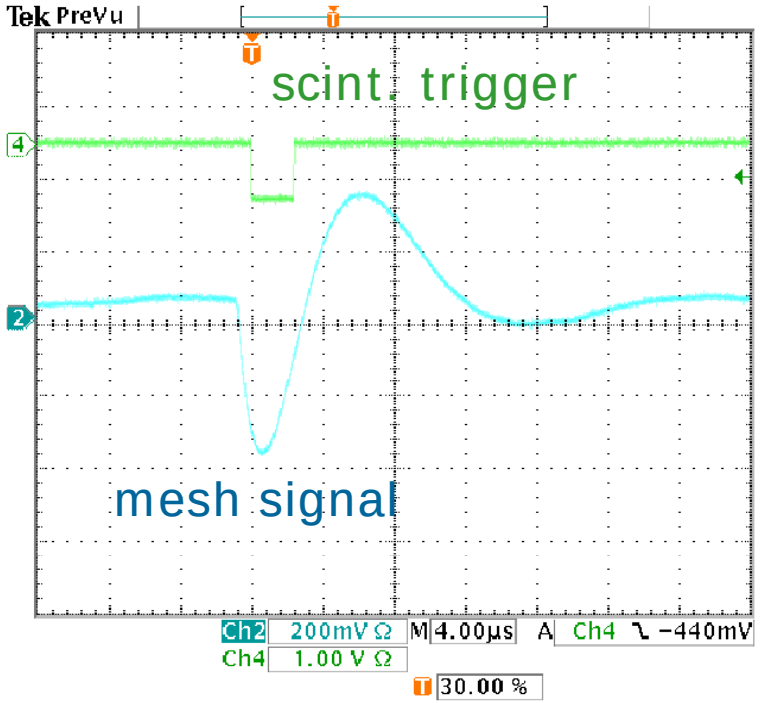
large area GRPC



µMEGAS development & characterization

µMEGAS : LAPP+IPNL (see Catherine talk)
8X8 pads (*mesh*) ok , 6X16 pads (*bulk*) ok , 8X32 pads (soon)
(collaboration with Saclay and CERN))





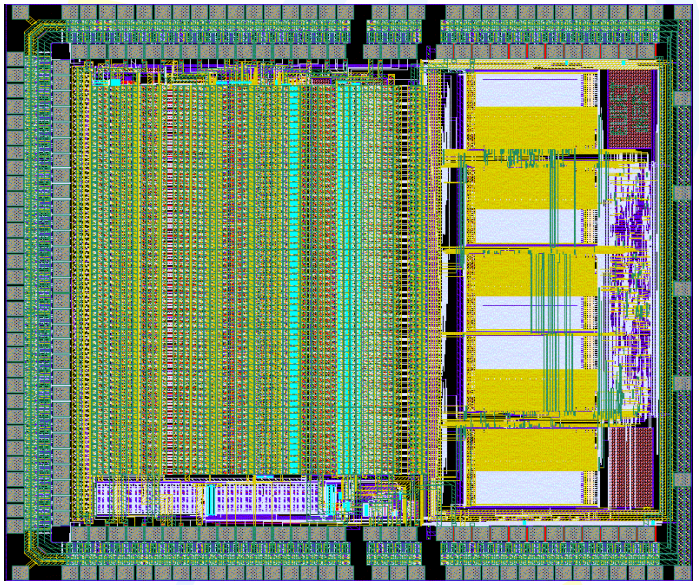
Activities:
Efficiency, X-talk, homogeneity

more efforts for large µMEGAS (largest mesh size 50X50 cm2)

Electronics development

LAL, IPNL, LLR

HaRDROC1



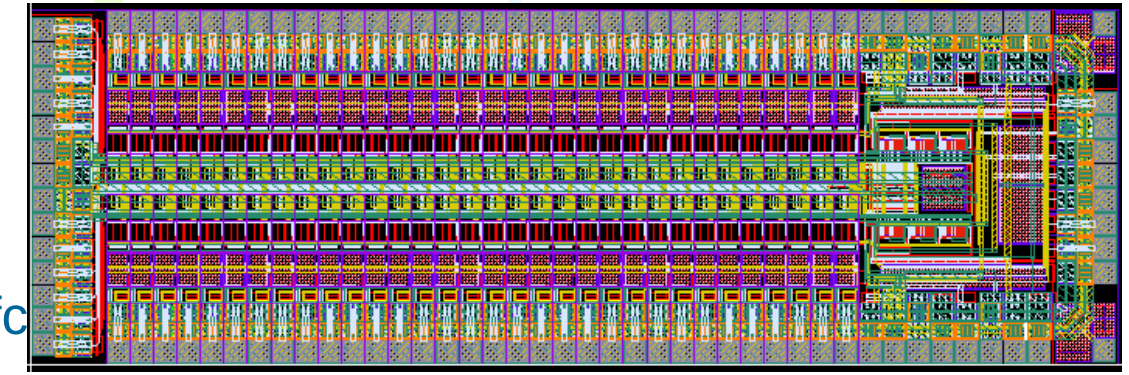
- 64 ch.
- Digital/analogue output.
- Low consumption, power pulsing.
- Digital memory.
- GRPC (µMEGAS? Mikhail work)
- SiGe

Already tested

New development for low charge detector, new chip

- 64 ch (charge preamp)
- Digital output.
- Low consumption, power pulsing.
- Digital memory(5 evts)
- µMEGAS (threshold # 2 fc

To be tested soon

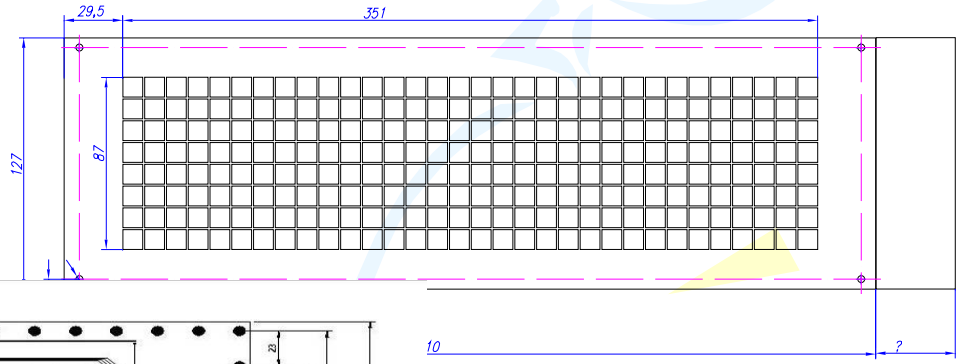


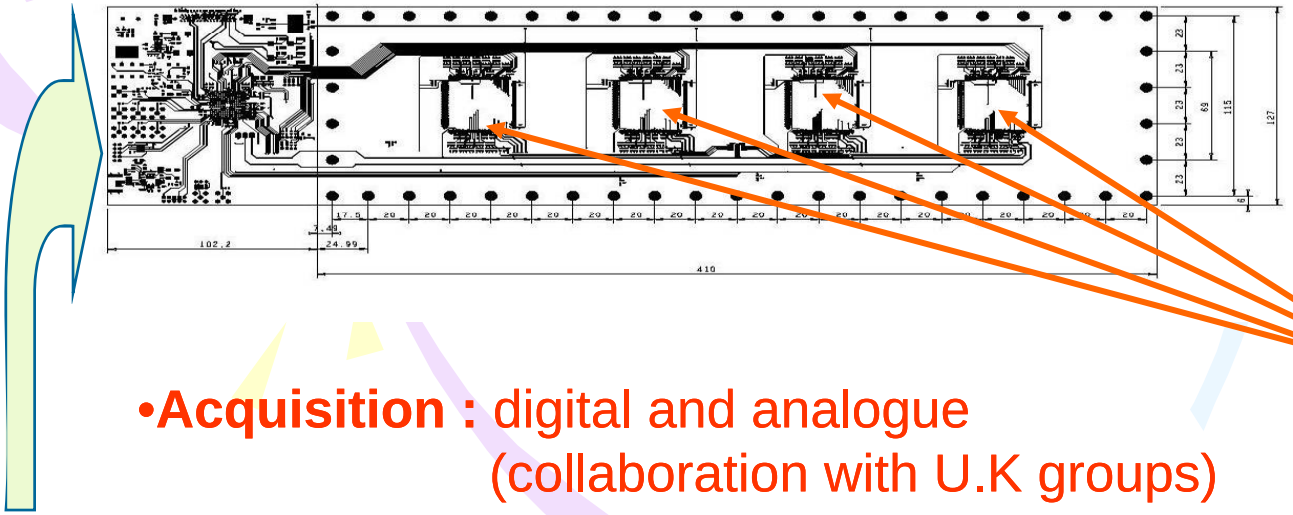
4-Chip board

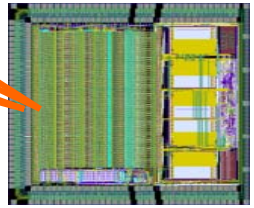
Aims:

- **Validate electronics for DHCAL**
- **Study the different detectors behavior.**

- **8X32 pads detector (GRPC and µMEGAS)**
- **8-layer PCB**
- **4 HARDROC**
- **Readout** USB + FPGA
  (see Clément talk)

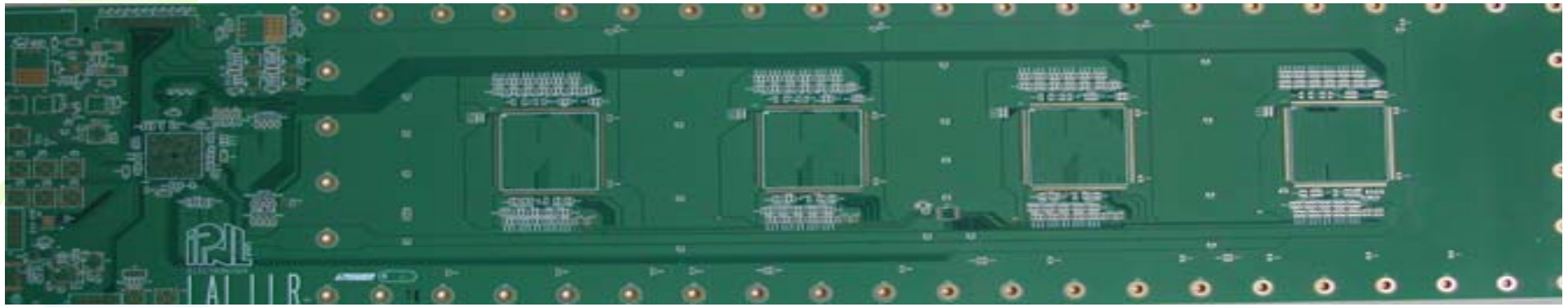




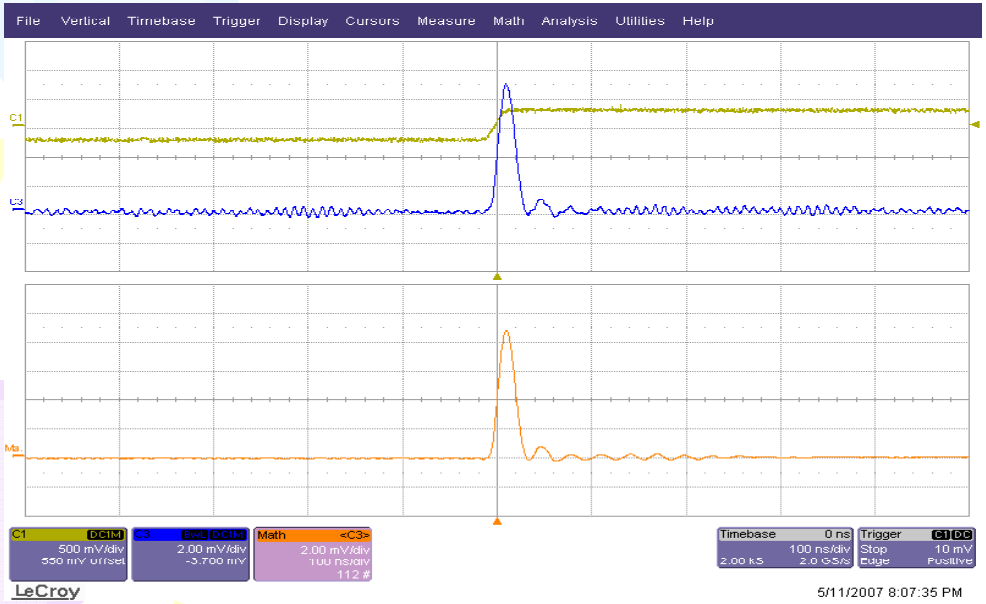


- **Acquisition :** digital and analogue
  (collaboration with U.K groups)

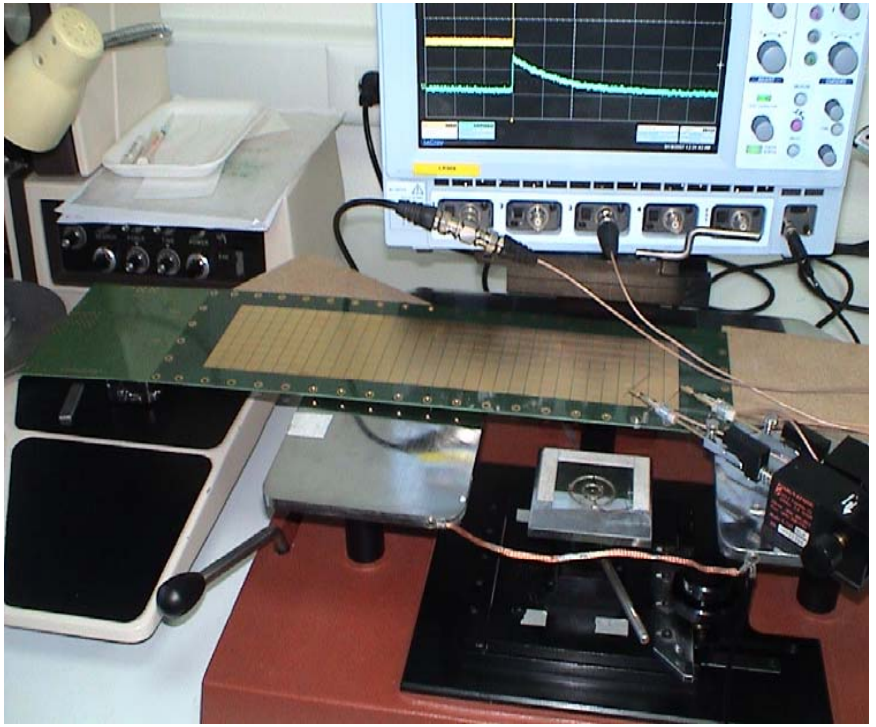
- 8-layer PCB , 800 µ thick
- 8X32 pads of 1 cm2 and 500 µ separation

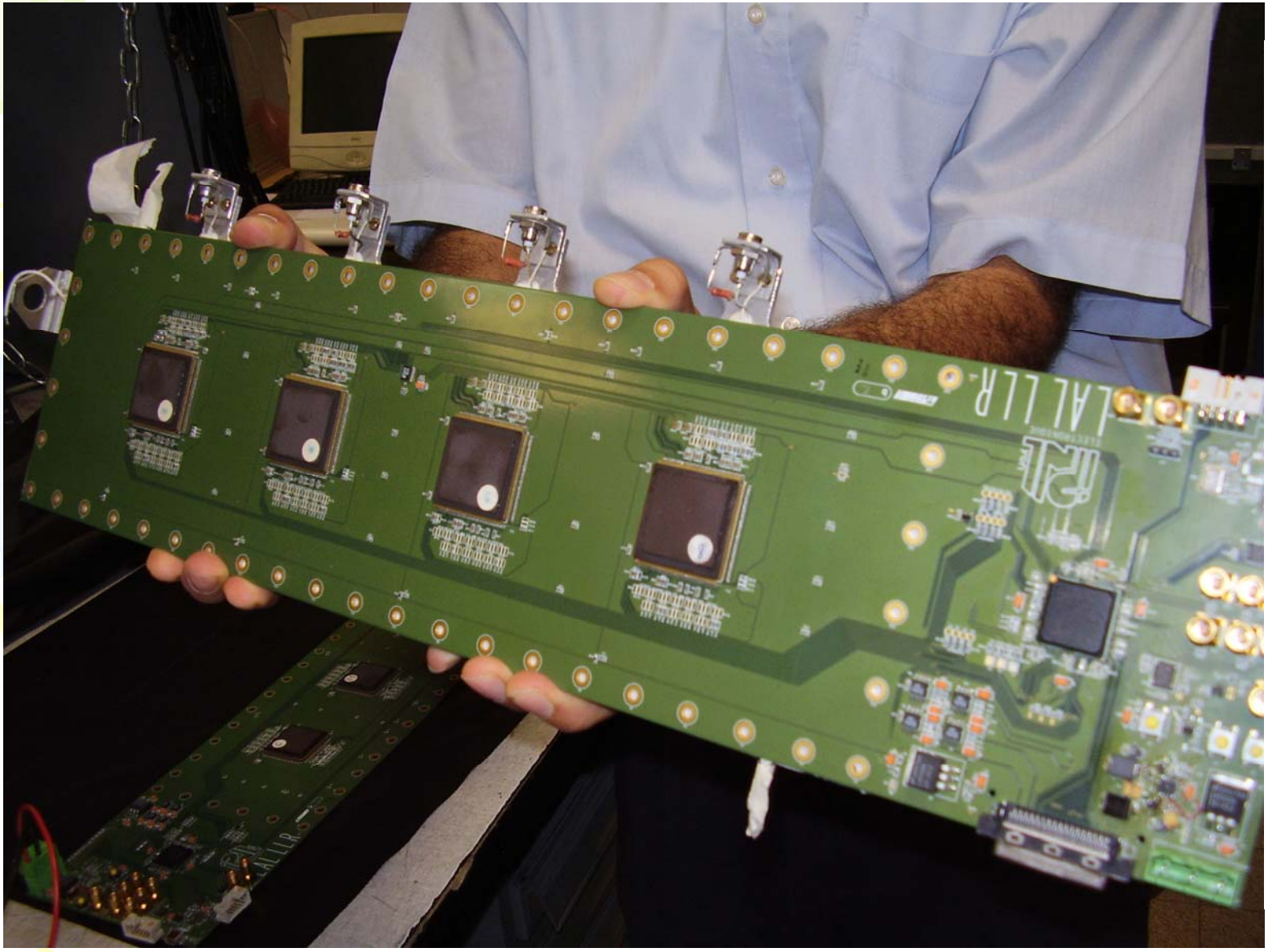


See Hervé talk



X-talk (<0.5 %)

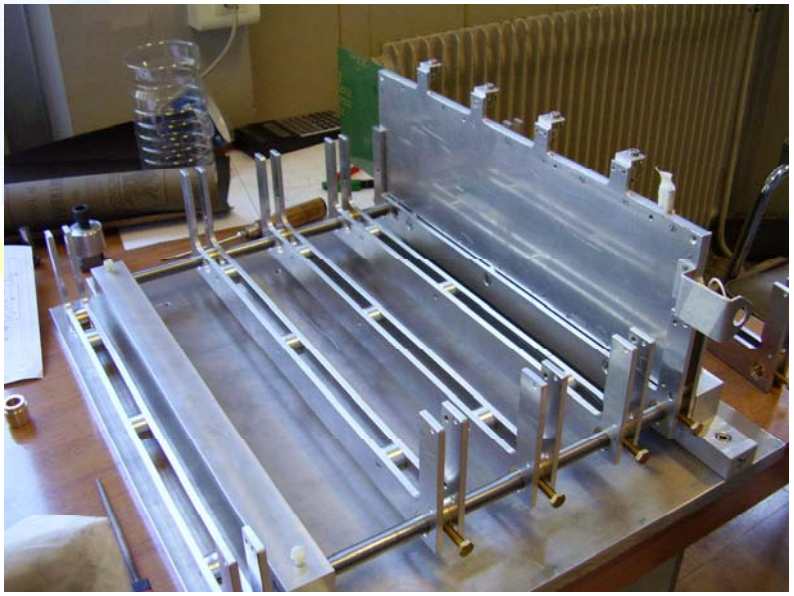


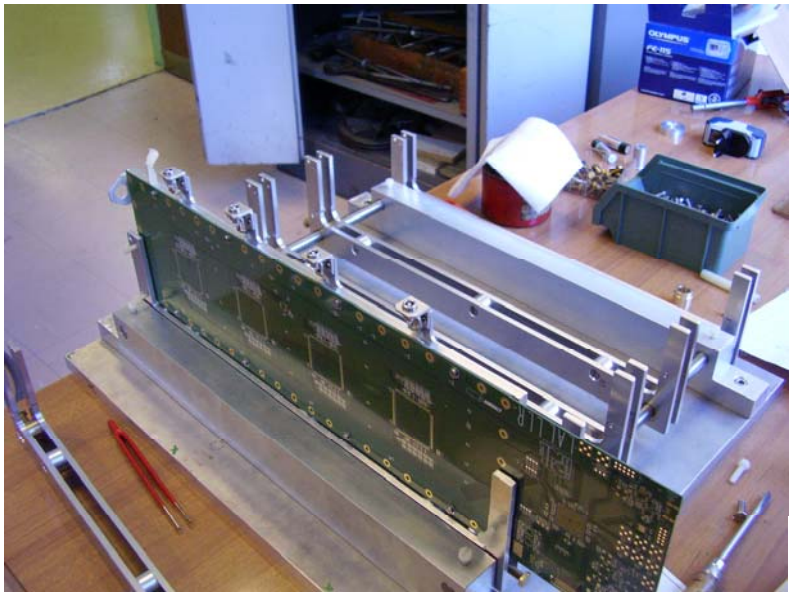


Towards beam test at DESY

To do List:

- Acquisition: to be completed soon (1-2 weeks)
- Detectors: GRPC is ready, MICROMEGAS to be built soon using the same mesh structure to be used by T2K
- Setup: Almost done with the possibility to host few detectors





Towards the prototype

Milestones:

The aim is to build a prototype as close as possible to the final one (technological prototype)

- The first step after the DESY beam test is to build a large area detectors (>1m2) with an extensible scheme
- Compare different detectors before to make a detector choice

Then

Build a prototype of 40 planes of 70X70 cm2 each

- Detectors (IHEP,IPNL,LAPP,....)
- Mechanical structure (CIEMAT, IPNL, LAPP,...)
- Readout Electronics (LAL,LLR,IPNL,LAPP,...)
- DAQ (collaboration with UK groups)

Funding

3-year funding form “Agence nationale de la Recherche” (ANR)

670 k$** = 480 k$ + 190 k$(postdoc) **OK

Requested for 2008 from IN2P3-CNRS
(R&D and prototype construction only)

240 k$ **waiting**

This will able us to build our technological prototype

Conclusions

- The EDHCAL collaboration is now well established things are going as predicted;
- Going to large area fully equipped detectors will be the main issue very soon;
- There is still place for other groups to join the efforts for the technological prototype project.