Laboratoire d'Annecy-le-Vieux de Physique des Particules

CALICE Calorimeter for ILC

Actual Micromegas USB DAQ ASU and DIF

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14th january 2010

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

IN2P3 Institut National de Physique Nucléaire et de Physique des Particules

Université de Savoie Chambery Annecy

Electronic LAPP team

- **Julie Prast**: DIF conception, DIF Link Study
- **Guillaume Vouters**: DIF firmware development, ASU test, integration
- **Sebastien Cap**: DIF CAO, interDIF Conception&CAO, integration
- **Renaud Gaglione**: Dirac conception(ASIC&ASU), R&D protection inside PCB ASU test, integration .
- **Alexandre Dalmaz**: ASUs CAO (Hardroc&Dirac), R&D protection inside PCB
- **Cyril Drancourt**: ASU Hardroc conception, ASU test, LabVIEW, integration

Electronic study at LAPP

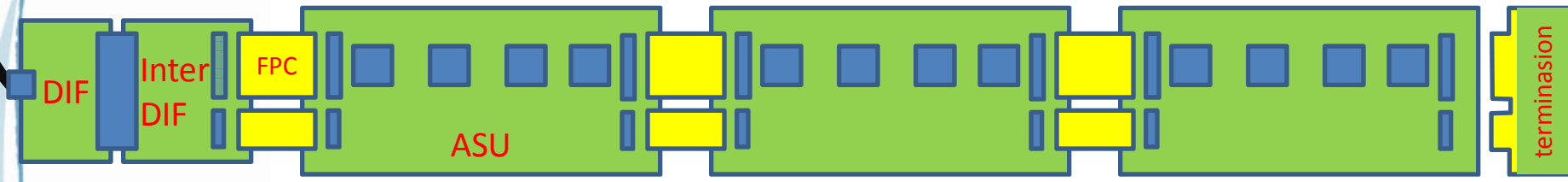
- DIF Board (2007-2008)
- ASIC : Dirac2 (2009)
- ASU PCB with several ASIC
  - Hardroc1 (sept 2008)
  - Hardroc2 (fev 2009)
  - Dirac2 (sept 2009)
- Calibration Labview software (mai09-jan10)
- Detector test (beam, source) with Xdaq
- Acquisition Labview software (sept09-jan10)

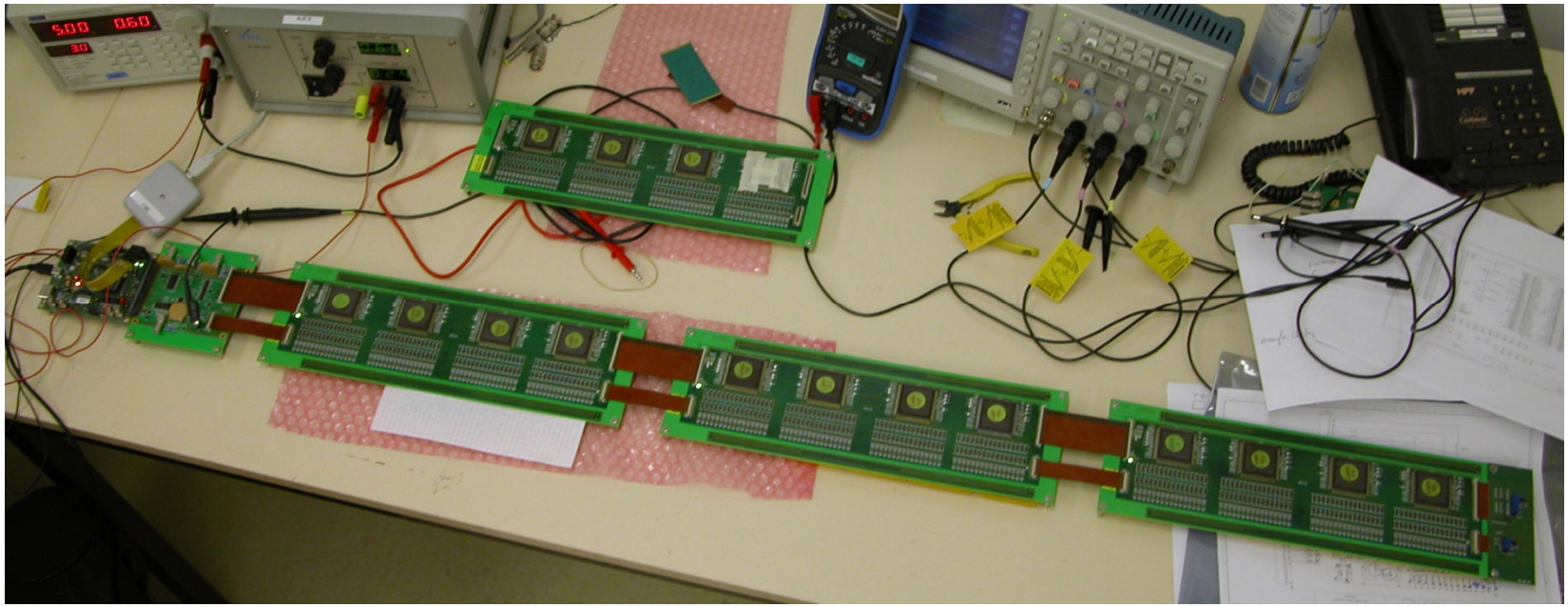
LAPP beam test

- august 2008: caractérisation prototypes analogiques (gassiplex) : CENTAURE DAQ
- novembre 2008: caractérisation prototypes analogiques + premiers test hardroc1 : CENTAURE DAQ + XDAQ
- mai 2009: mesures calorimétriques avec prototype analogiques + test hardroc1 : CENTAURE DAQ + XDAQ
- sept 2009 : mesures calorimétriques avec prototype analogiques + tests hardroc1 : CENTAURE DAQ + XDAQ
- nov 2009 : tests Dirac + hardroc2: LabVIEW DAQ + XDAQ

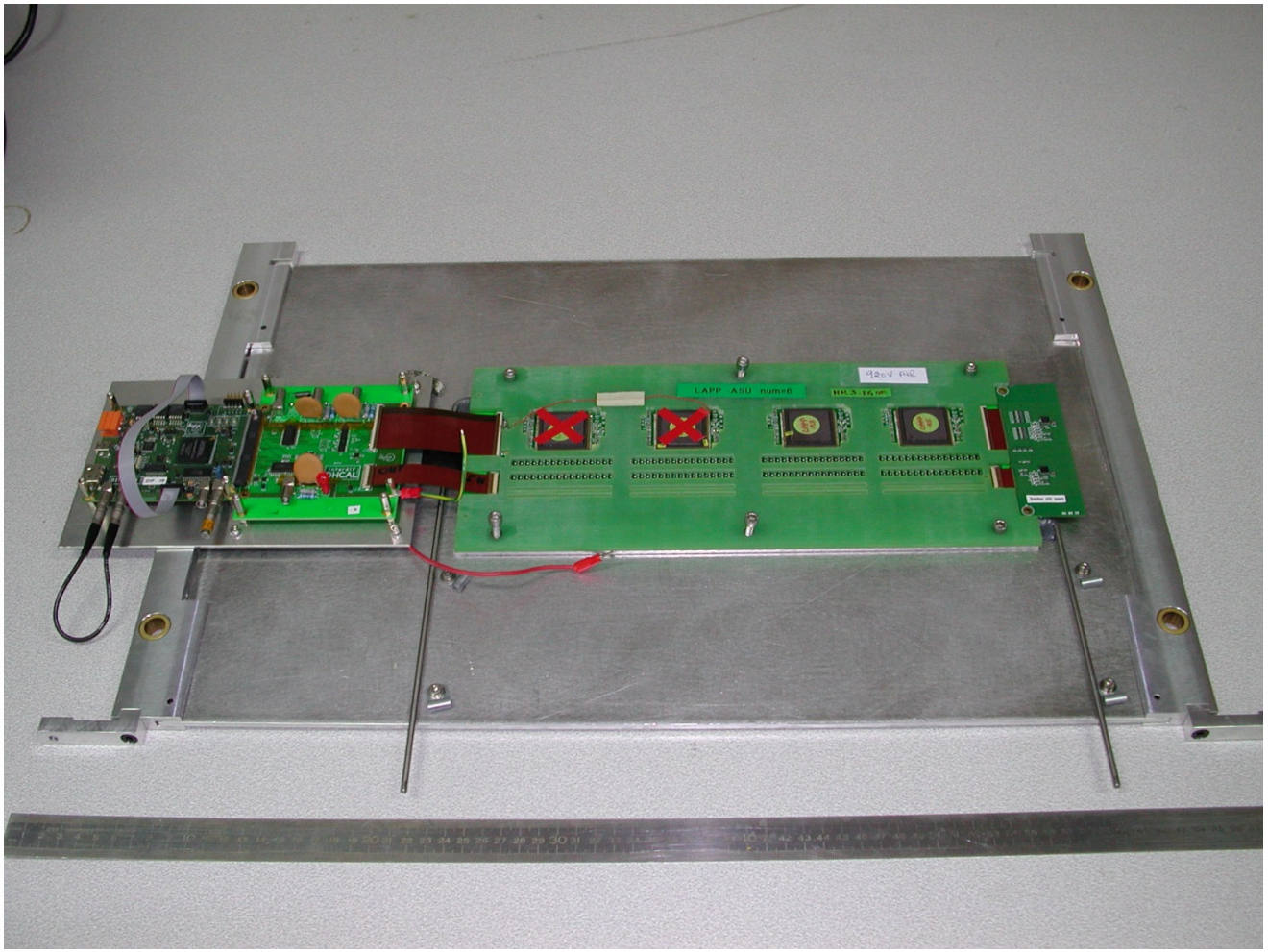
board with Hardroc1

USB

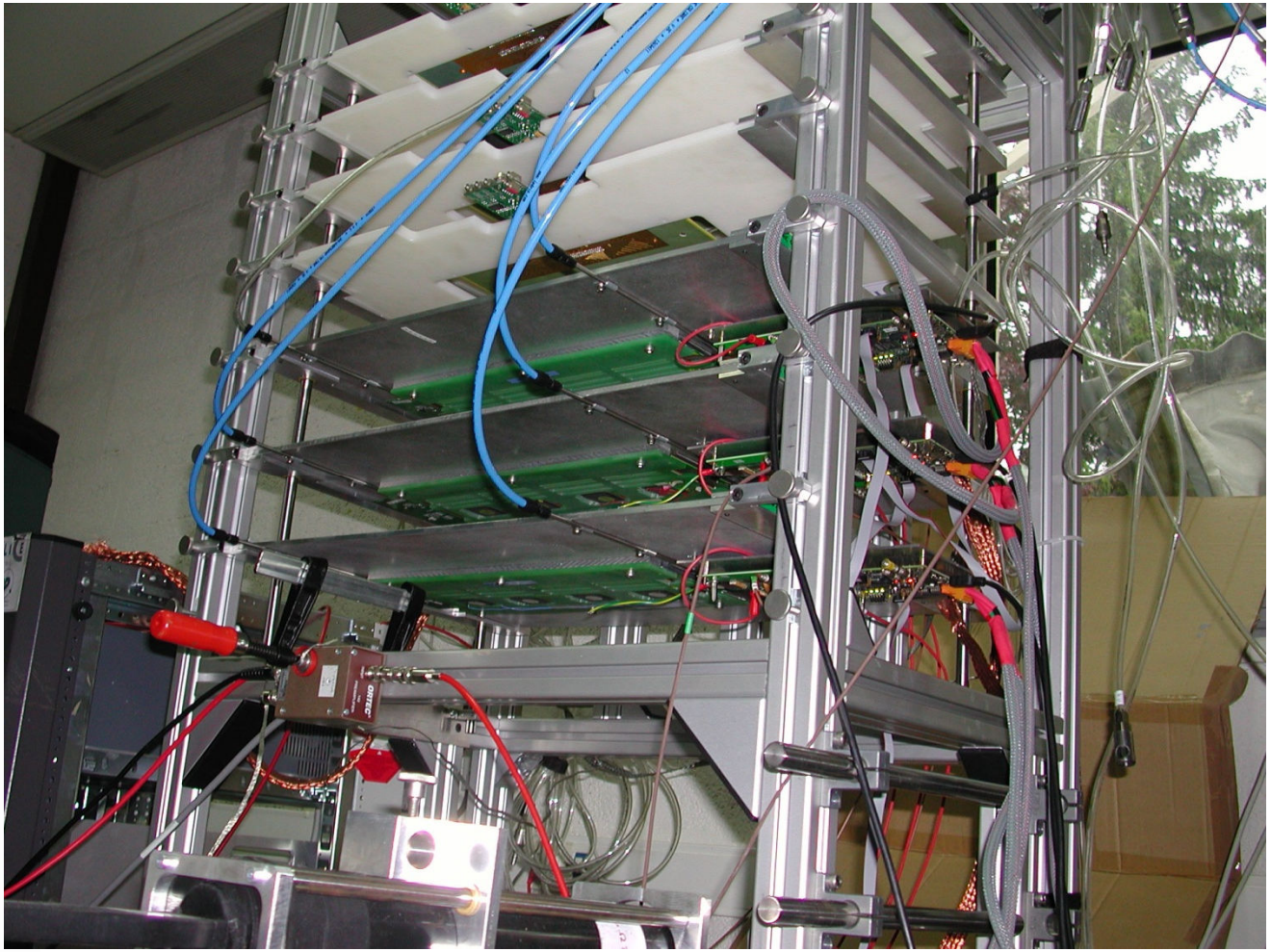




detector with Hardroc1



detectors with Hardroc1



Boards with Hardroc2

USB

DIF

Samtec connection

INTERDIF

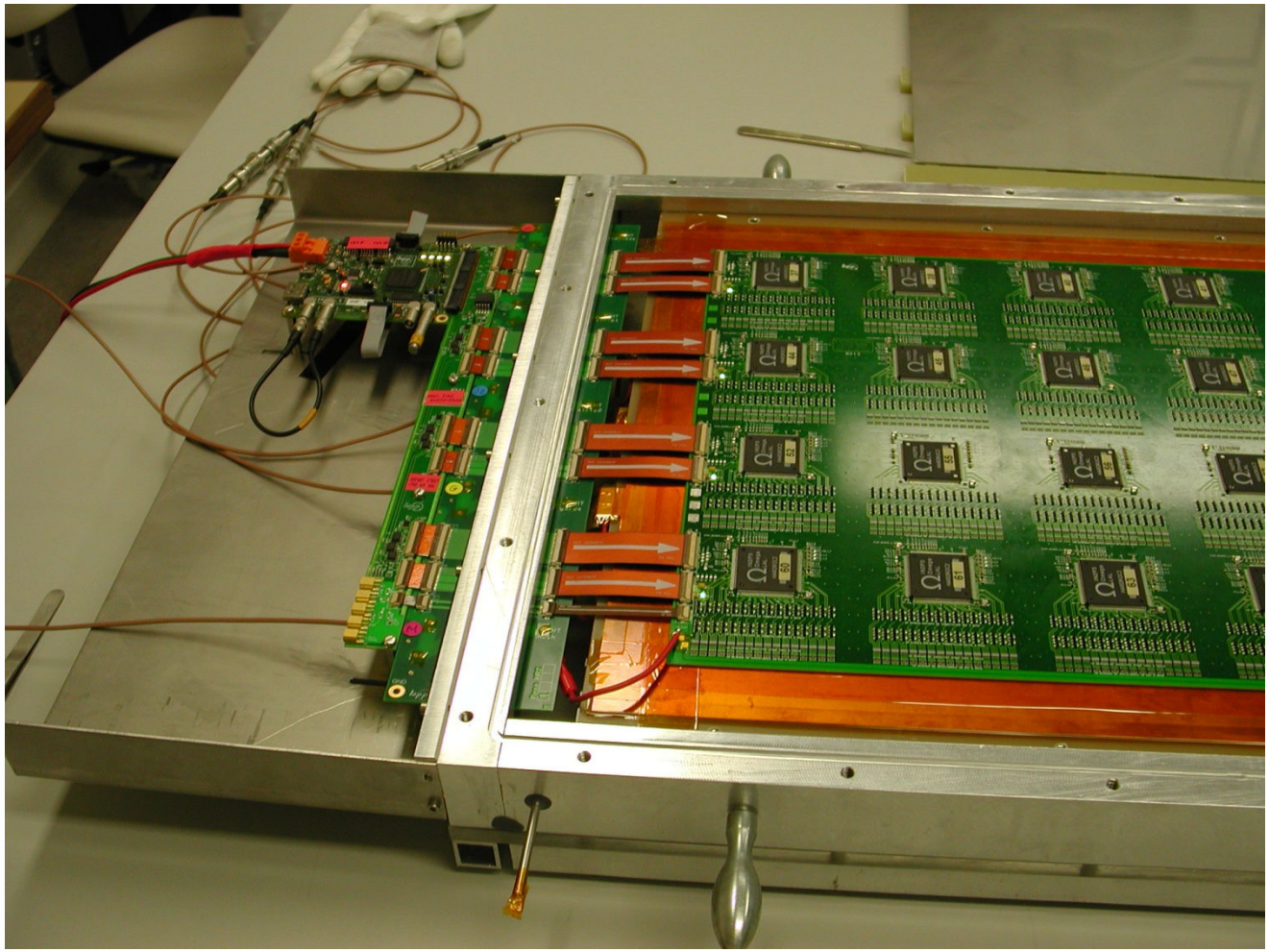
~1 m

ASU

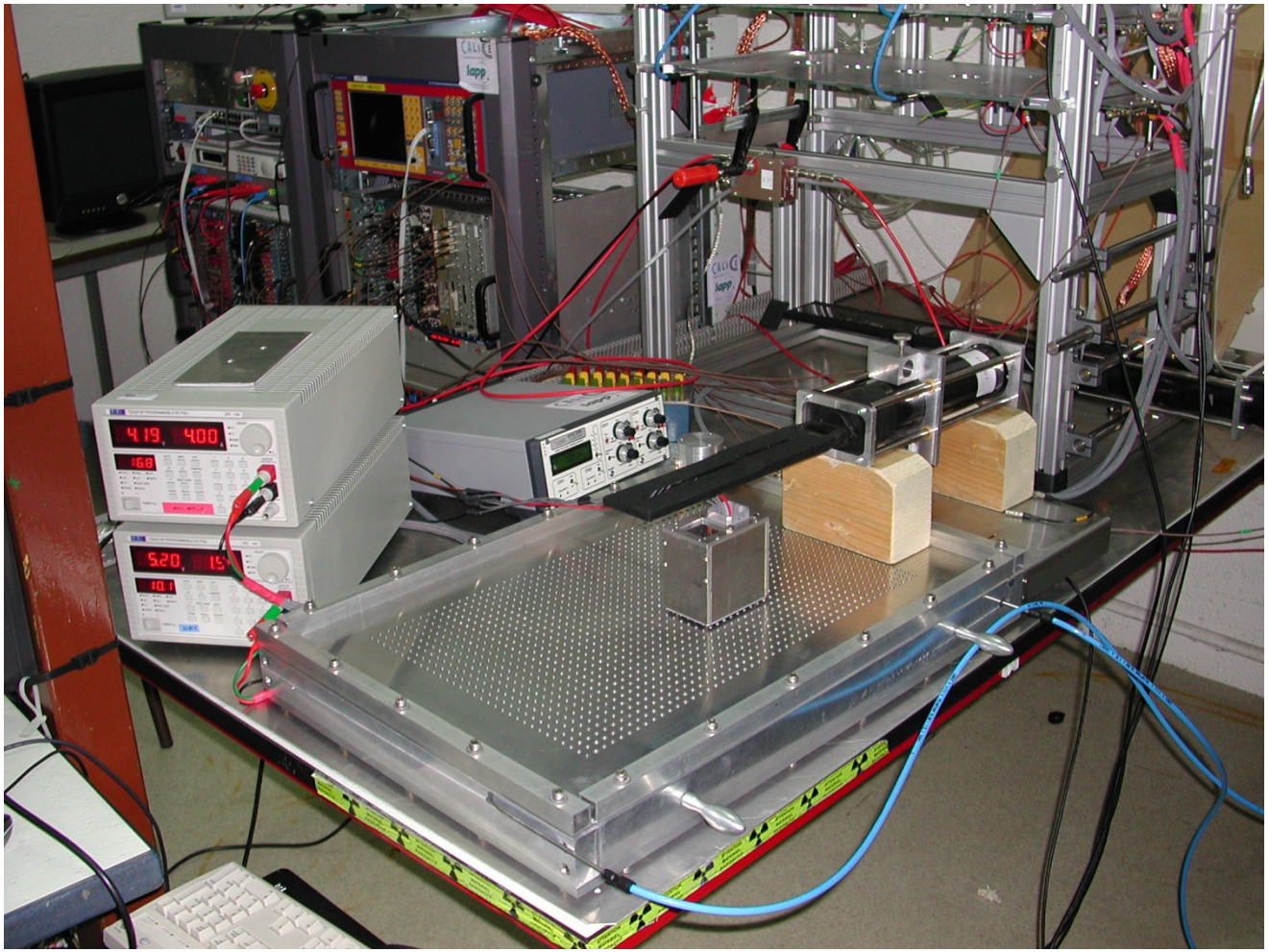
ASU

~0.33 m

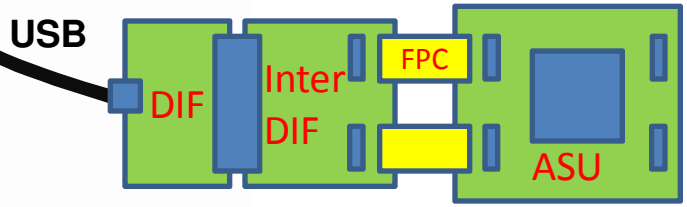
Board in test box

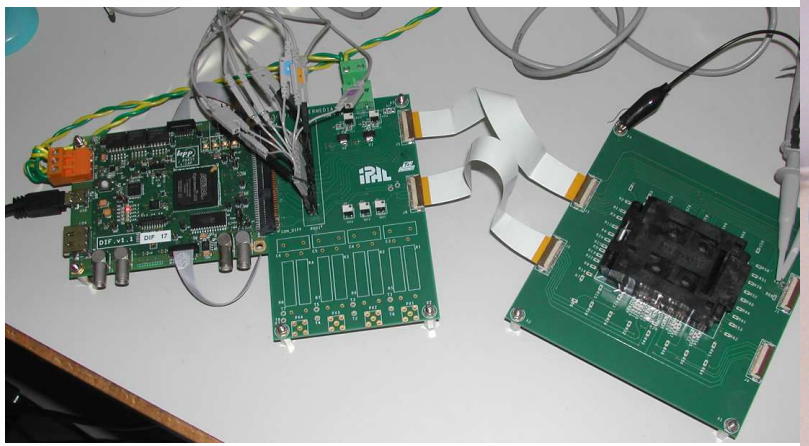


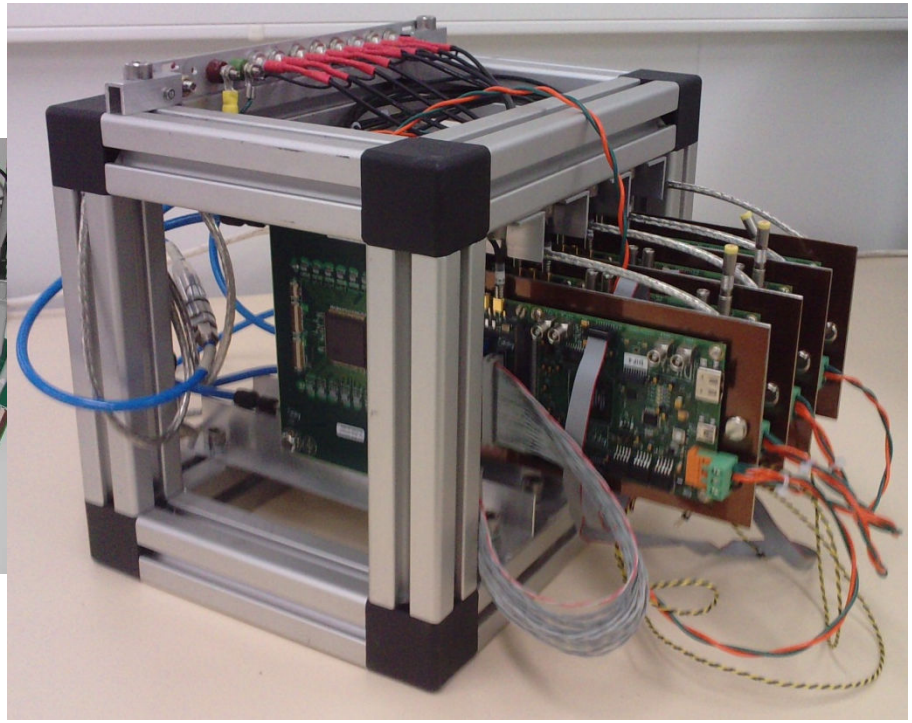
Board in test box



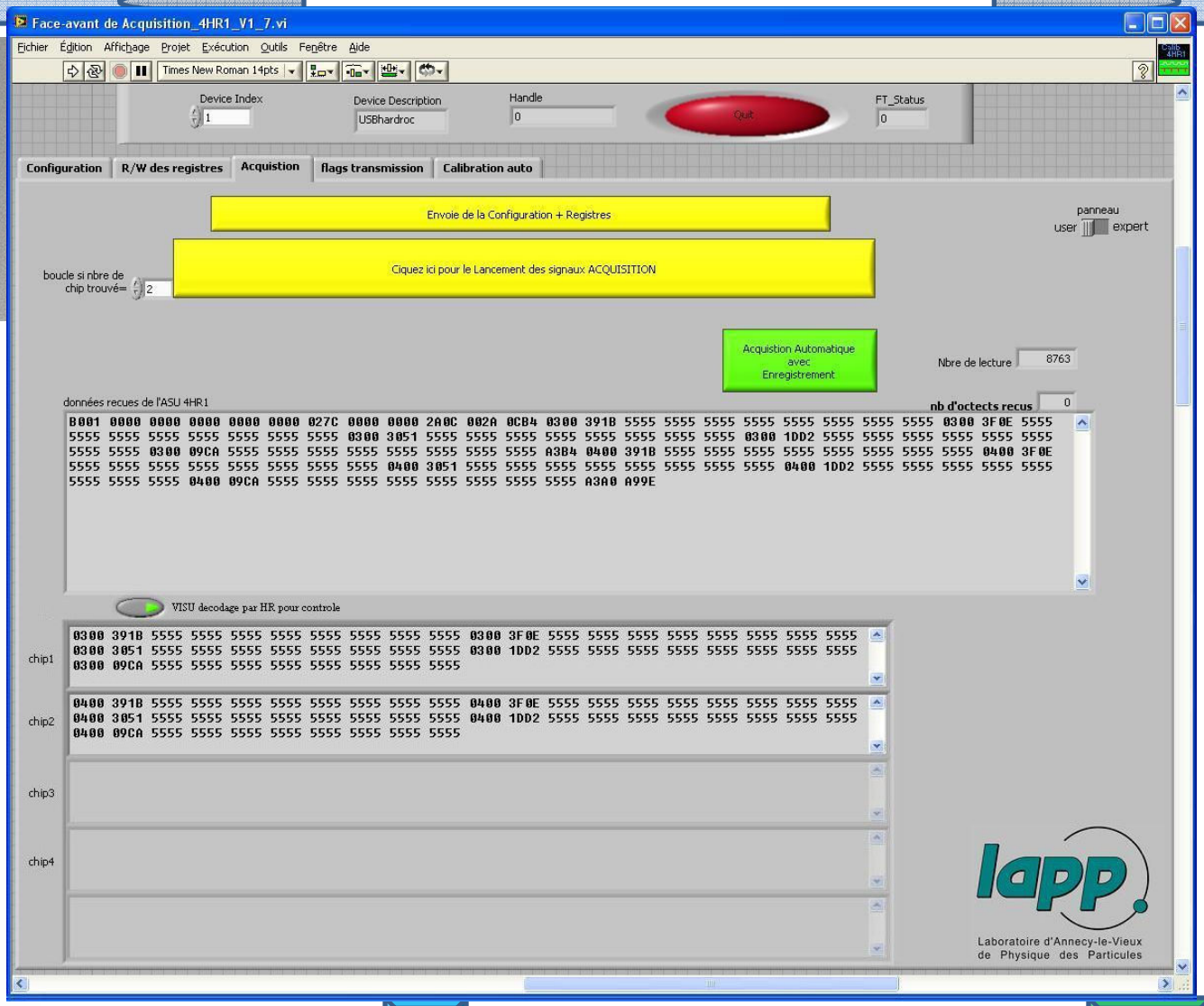
board with DIRAC2



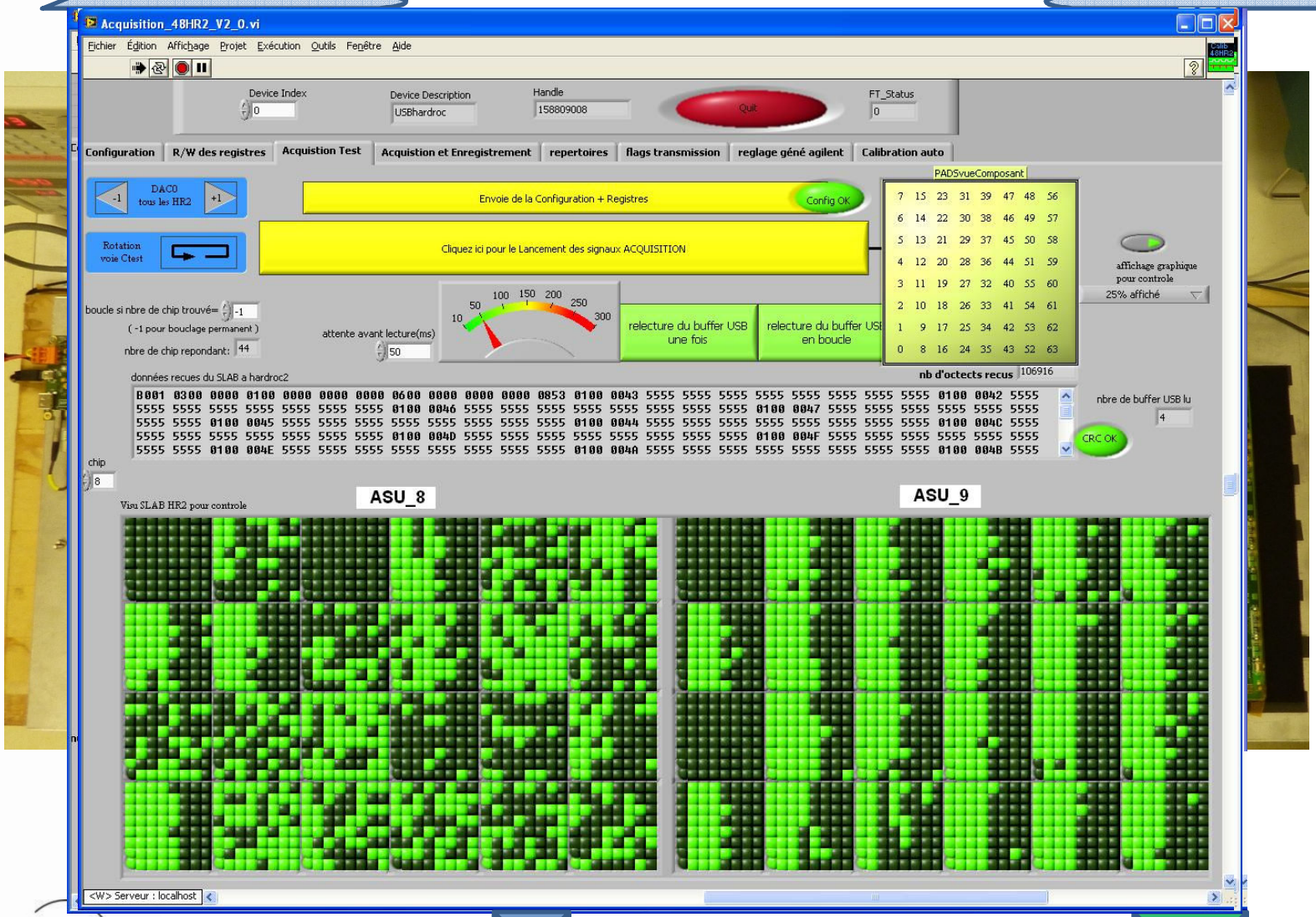




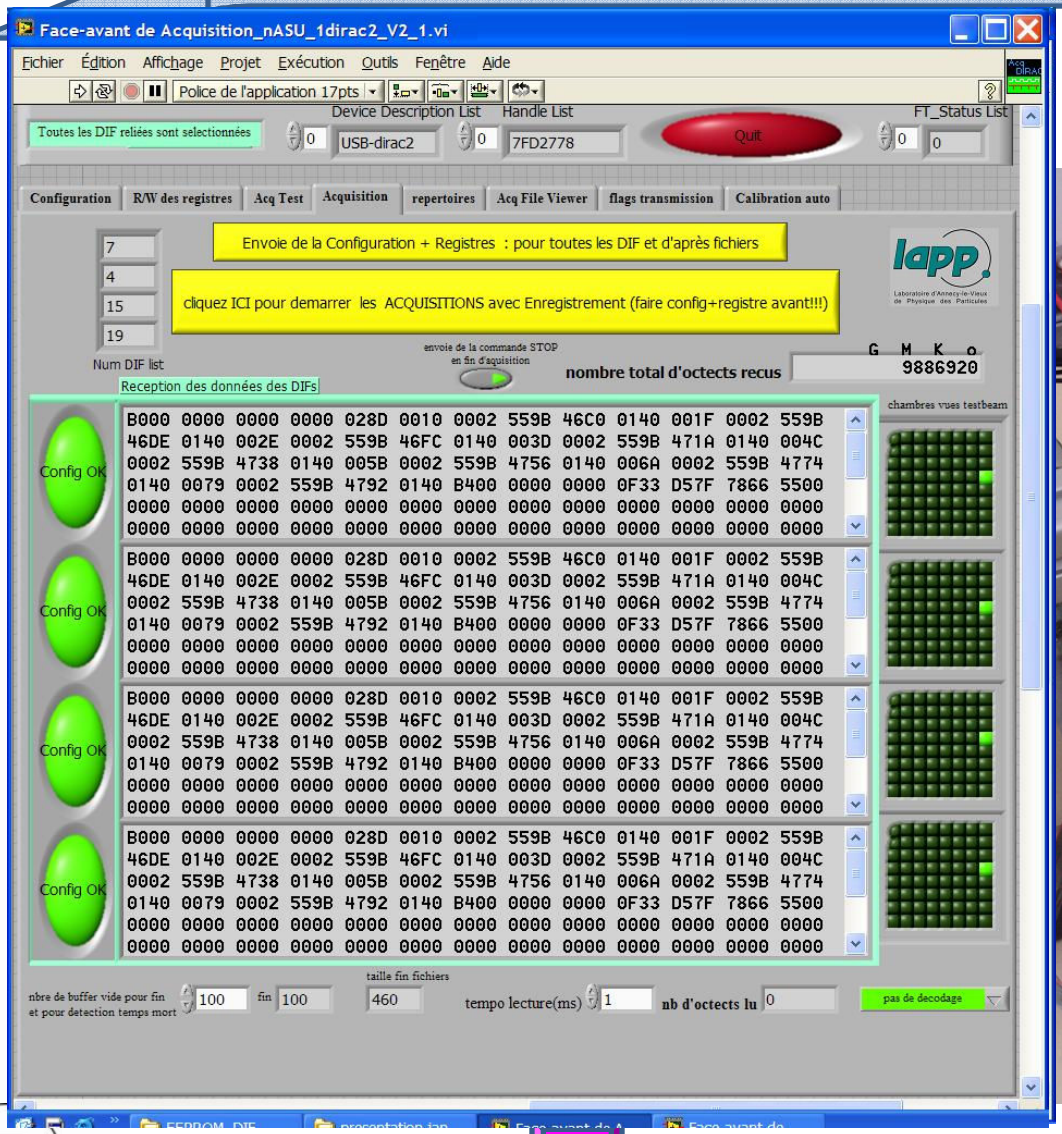
LAPP LabVIEW Hardroc1

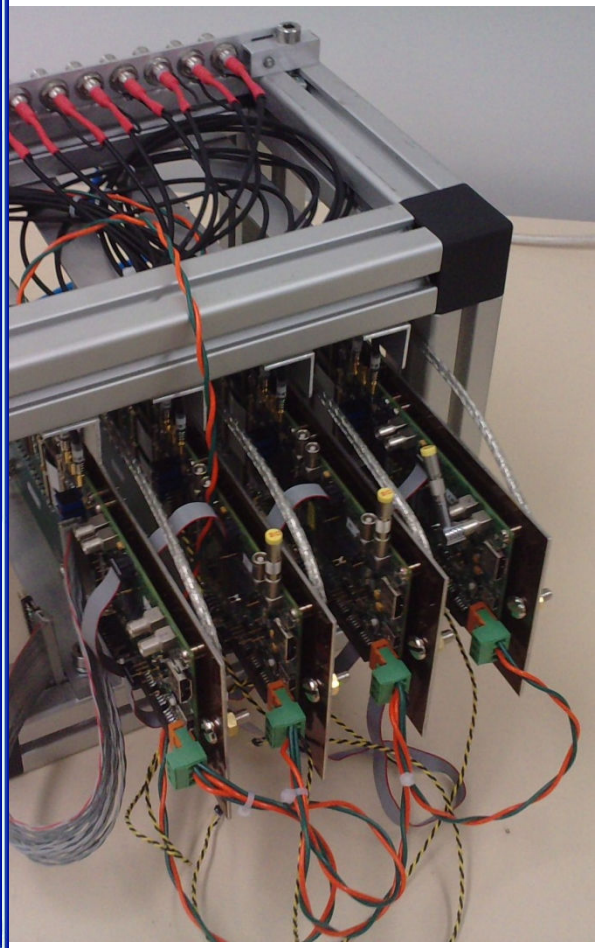


LAPP LabVIEW Hardroc2

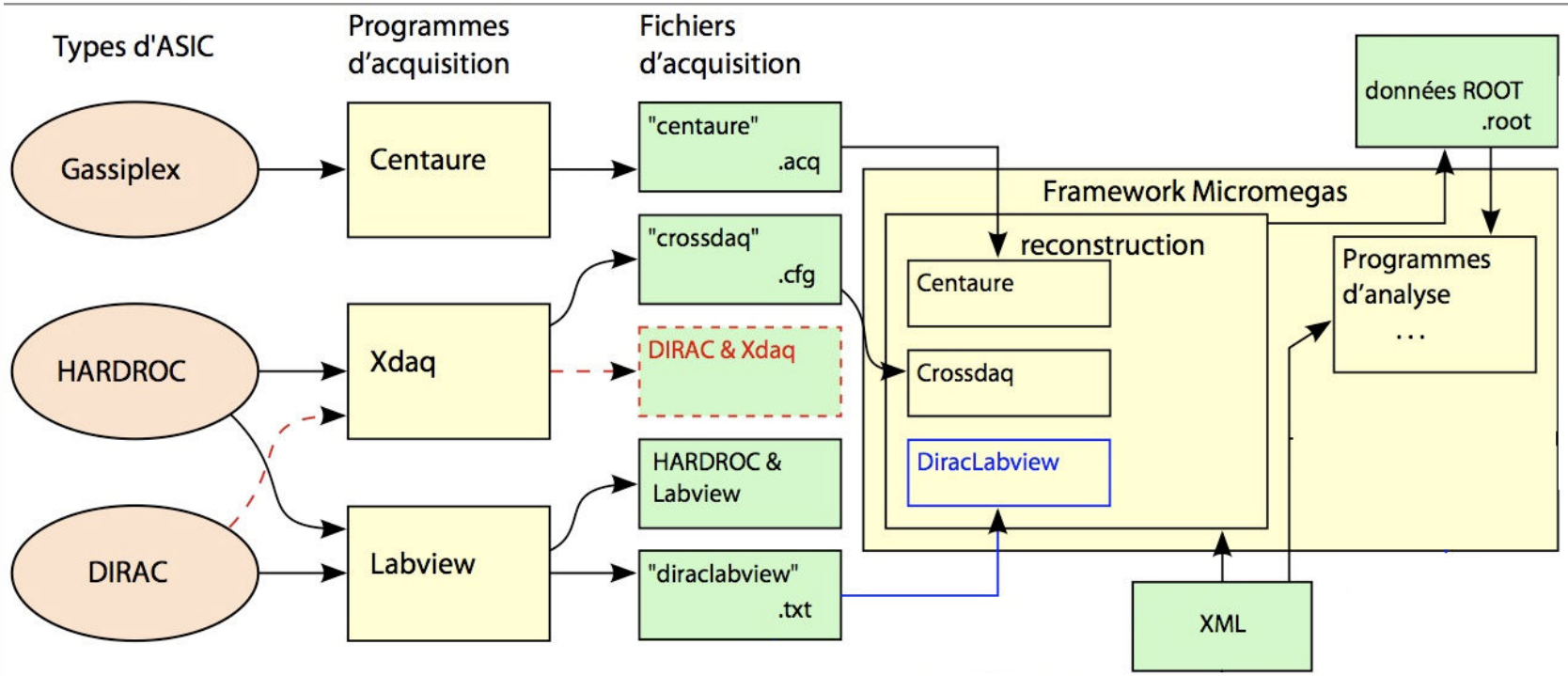


LAPP LabVIEW Dirac2





Framework de reconstruction et d'analyse



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DHCAL DIF Production for the Cubic Meter

Sébastien Cap, Guillaume Vouters, Julie Prast

14th january 2010

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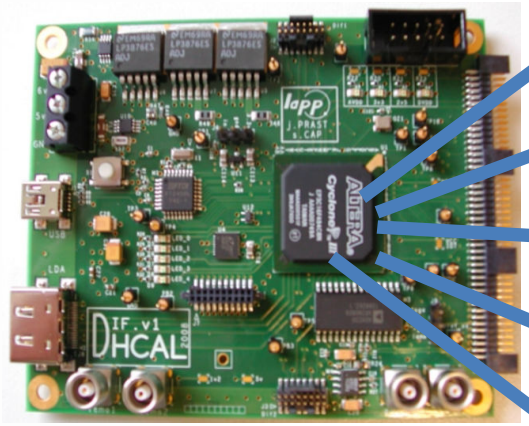
DIF



VHDL firmware1 for Hardroc1 Micromegas

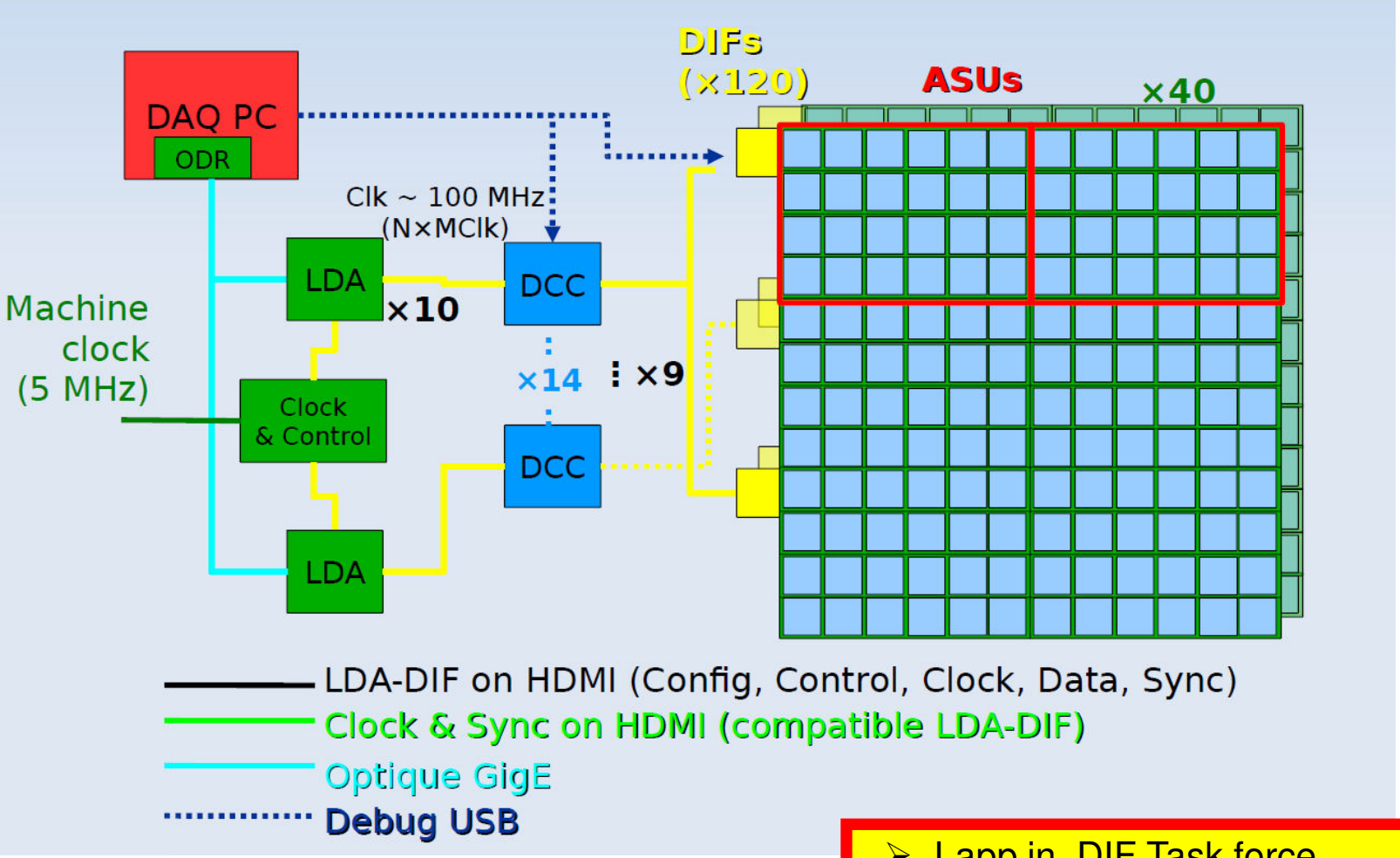
VHDL firmware2 for Hardroc1 RPC

VHDL firmware3 for Dirac2 Micromegas

VHDL firmware4 for Hardroc2 Micromegas

VHDL firmware5 for Calice DAQ Test

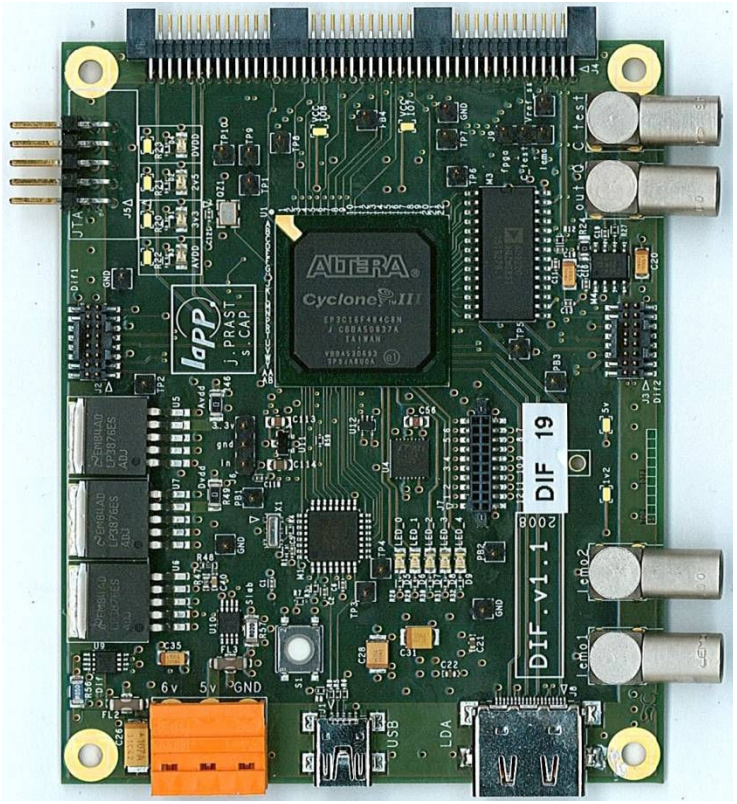
CALICE DAQ



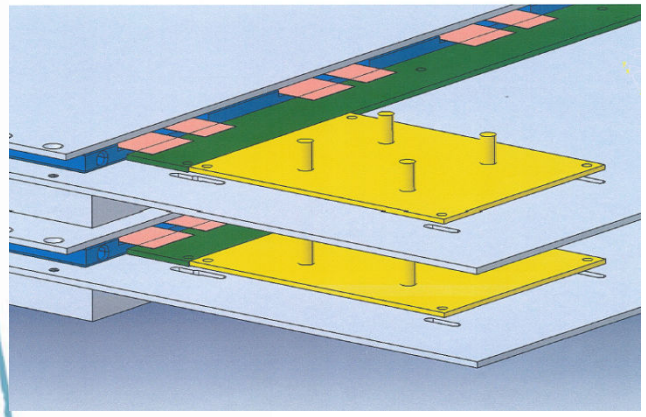
- Lapp in DIF Task force

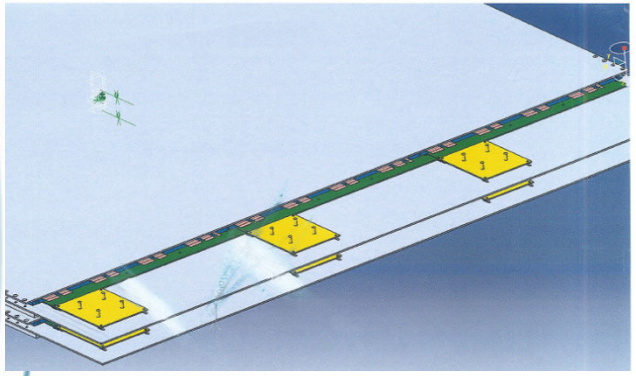
DHCAL DIF Production

- 120 DIF have to be produced for the m^3 (+ spares ie 140 ?).
- The DIF will be produced as they are currently.
  - The board works quite well.
  - We do not have time to make a new prototype (schedule + manpower).
- Boards will be produced and tested for beginning of fall 2010.
  - Some boards can be available before if required (> end of spring)



Answers for those who would like a new design

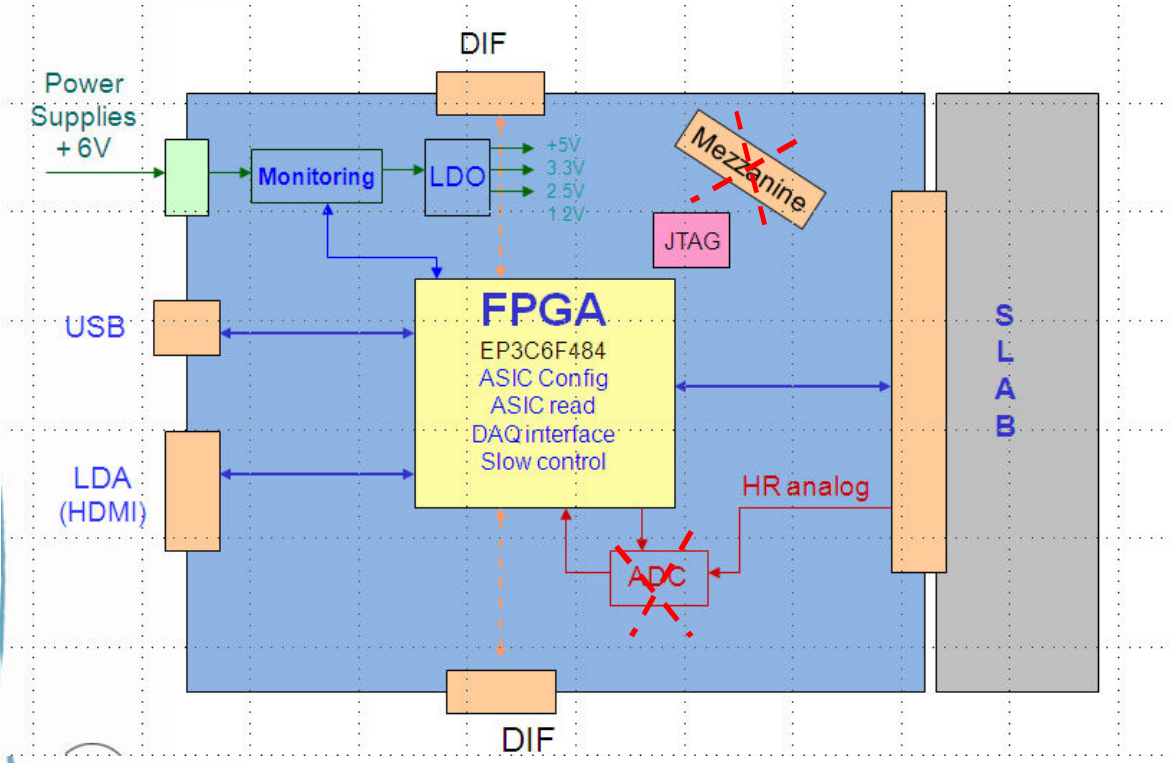




DIF integration in the m^3

- Connector reliability
  - The 2 guide pins must absolutely be used !
- DIF dimensions (5 cm width)
  - Not be determining to assess the feasibility of the calorimeter ! Everyone knows it is feasible (see ECAL DIF).
- Connector places (Front End)
  - Not ideal but compatible with m^3 mechanism.
- 8b/10b protocol implementation in Altera
  - HDMI DIF Module interface of Marc Kelly
  - Will be checked in February.

Production Costs



DIF cost (established for a production of 120) :

PCB : 20 + cabling : 30 + comp : 172 = 222 €

(187 € without ADC and mezzanine connector ; 166 € without lemo)

Interdif :

PCB : 20 + cabling : 30 + comp : 77 = 127 €

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Thank You

For Your Attention !

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