

Report from the Technical Board

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CALICE Collaboration Meeting Casablanca/Maroc Sept. 2010

Role of Technical Board

- Important executive body of CALICE
- Keeping track of activities
- Forum of experts of different detector technologies
- Foster collaboration between different projects
- Identification of needs for co-ordination and resources
- Technical preparation of strategic decisions to be taken by CALICE steering board
- TB can (and maybe should?) be the main communication channel between CALICE and testbeam sites
At least when preparing major beam test
At least it has to ensure that this communication happens

The Corner Stones

- Concluding the “Physics Prototype Phase” - Phase CALICE I

RPC DHCAL

Physics Prototype of W-HCAL

- Preparing/Realising the “Technological Prototype Phase” - Phase CALICE II

Several prototypes

- SDHCAL-GRPC

- SDHCAL with Micromegas

- SiW Ecal

 - Common effort with ScintEcal

- AHCAL

Towards the US-DHCAL

- US-DHCAL about to move into beam
Beam test scheduled for 8/10/10 (four weeks)
- 38 layers
- Integration with CALICE DAQ and Calice s/w well prepared
Implementation within next two weeks (tight but feasible)
- US-DHCAL will be supported by experts of other CALICE systems
during installation phase (starts 27/9/10)
- GEM DHCAL is charging along for eventual joint run with RPC

May join RPCs in second beam test period in 2011

Combined test beam – Detector Status and Constraints

- SiW Ecal

Combined beam test with US-DHCAL in early 2011
Operational but needs checking (during winter 2010)
Costs of beam test shared between ANL and in2p3

- TCMT

- Currently no funding for TCMT available
- Detector will be run by DESY colleagues with local support by NIU/ANL
TCMT is however operational

- Beamline/Trigger

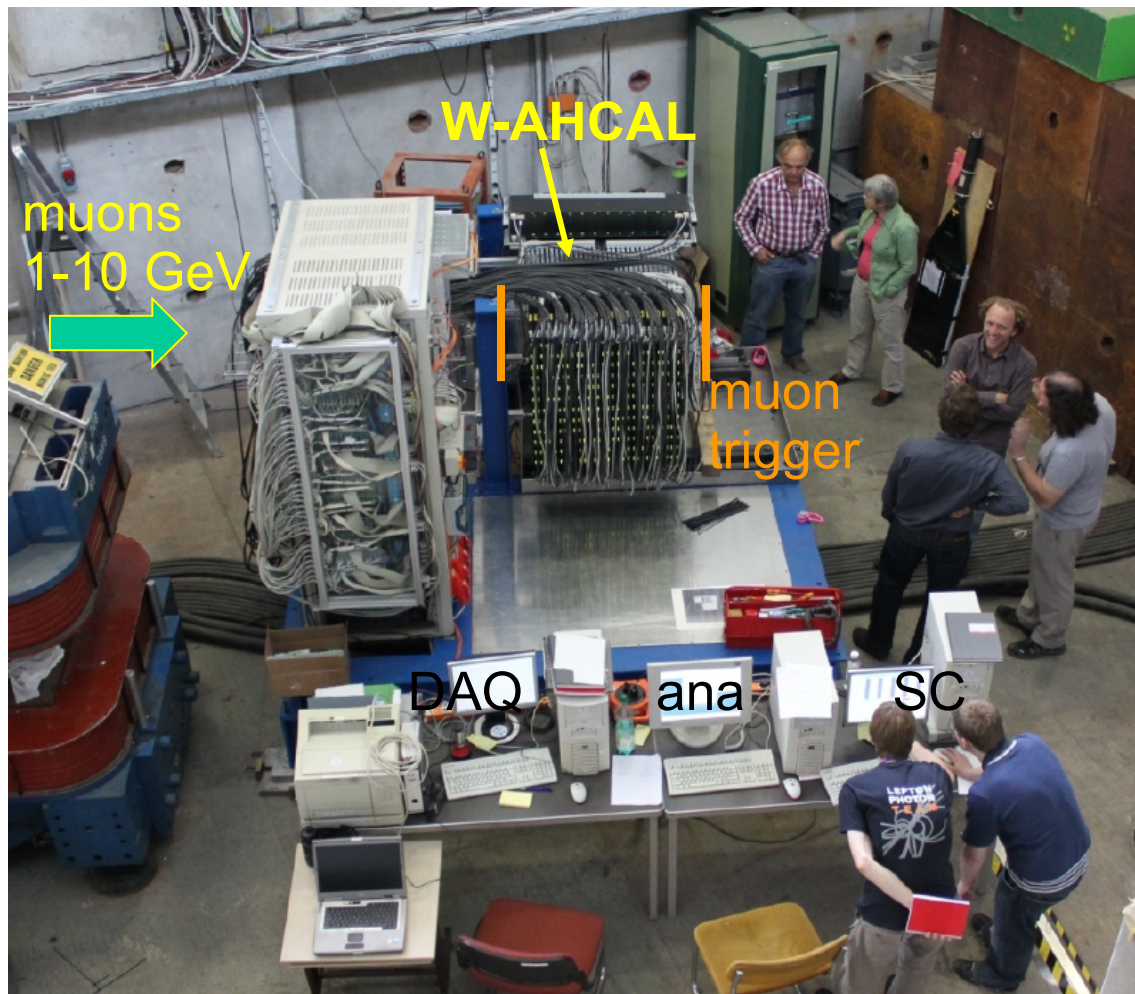
- Commissioning by DESY with support from other beam test participants

- Important issue

The CALICE stage can remain at FNAL beyond April 2011

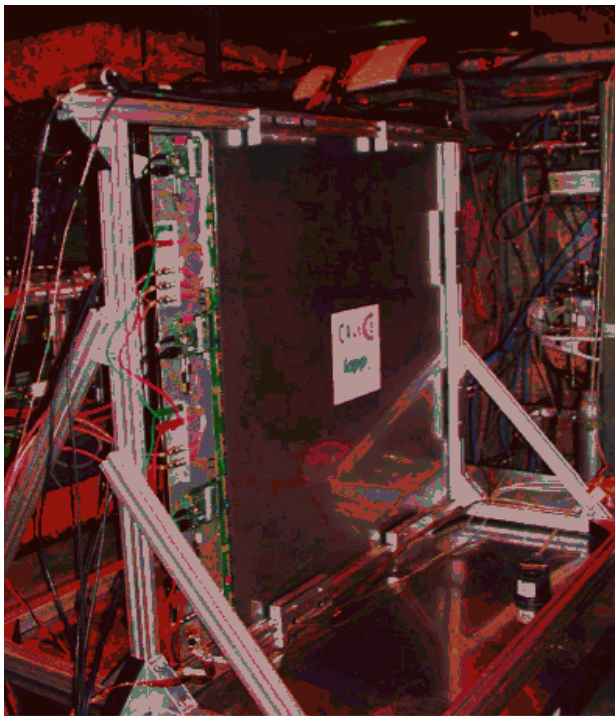
W-Hcal

1m³ W absorber with scintillating tiles



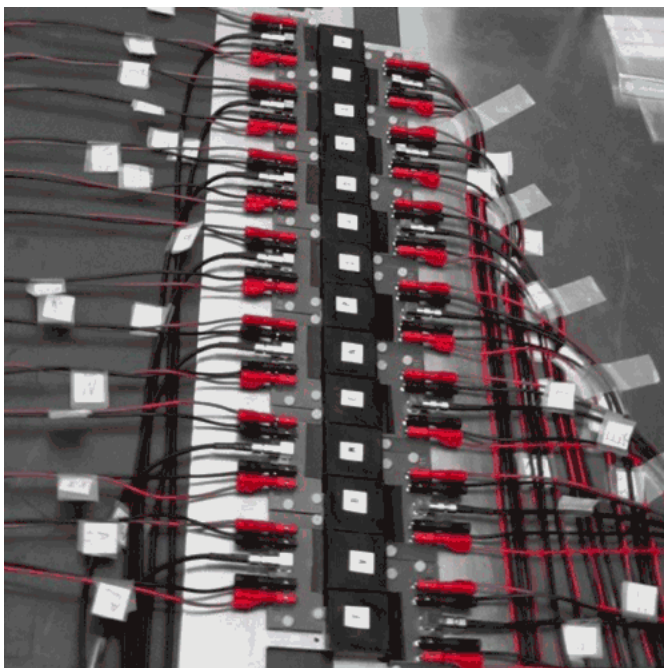
- Commissioning Sept. 2010 in T7 @ PS
Collecting muons in parasitic mode
- Data taking in Nov. 2010 in T9 @ PS
Continuation in 2011
- 'Old' Calice DAQ

W Hcal Beam Test – Secondary Devices



Micromegas Layer

- “31st” layer of tungsten stack
- Purpose is to study Micromegas in hadron showers developing in tungsten
- Need high energies and high statistics for useful results



T3B

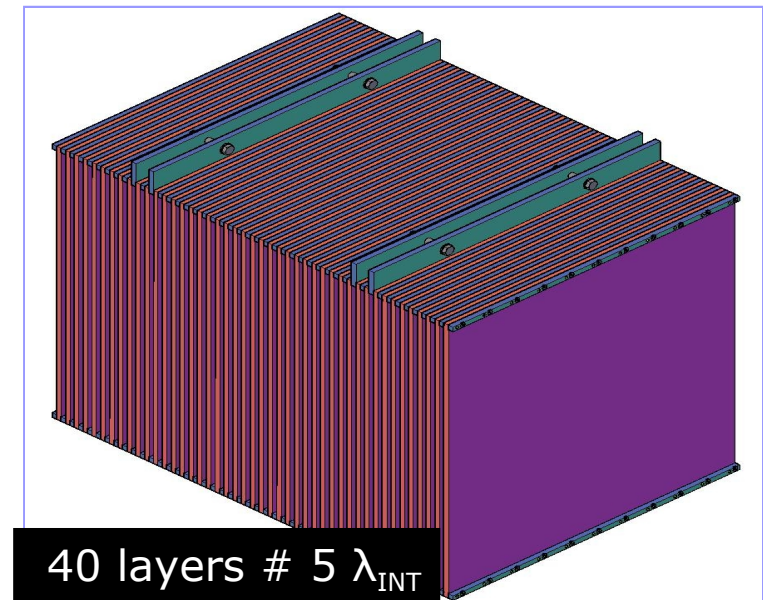
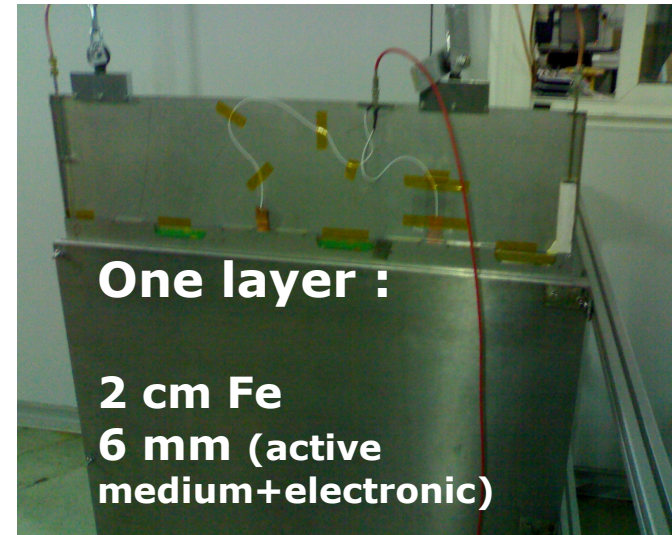
- Project to study time structure of hadronic showers
- Tiles, MPPC and Picosecond data acquisition
- Will sit behind W stack

Comment on DAQ Integration

- US-DHCAL effort and W-Hcal (+secondaries) need synchronisation with existing CALICE DAQ
- Central person for this is Paul Dauncey
- TB would like to take this opportunity to express in Gratitude to provide support for CALICE projects even under difficult circumstances in the UK
This is of course also true for other fields in CALICE

SDHCAL GRPC – Towards a 1m³ prototype

- successful tests with 1m² prototypes in 2009/10
Tests with HRI, HRII
- Chamber construction under control
- Very interesting results with semi conductive glass
-> High Rates ~100kHz/cm²
- 2010 test of power pulsing in magnetic field
- Step from USB based DAQ to “EUDET DAQ”

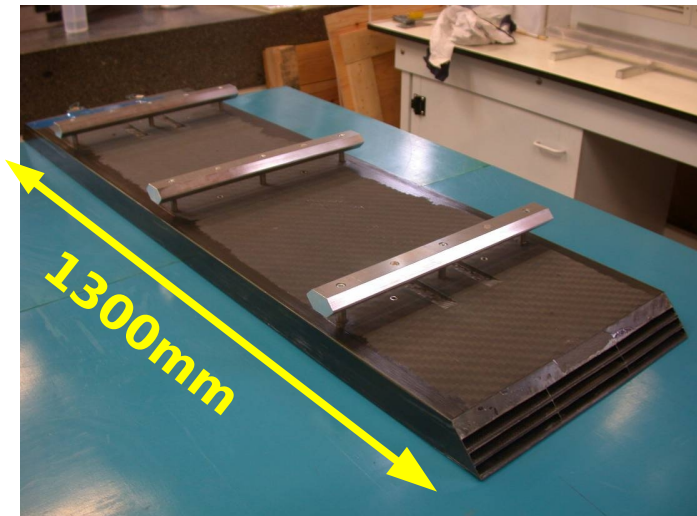


Eve of construction of 40 GRPC layers
Large scale beam test in 2011 - Vital for Calice input to DBD
1m³ stack can/will be partially equipped with Micromegas

AHCAL/SiW Ecal – Towards a Technological Prototype – Mechanical Structures



Analogue Hcal

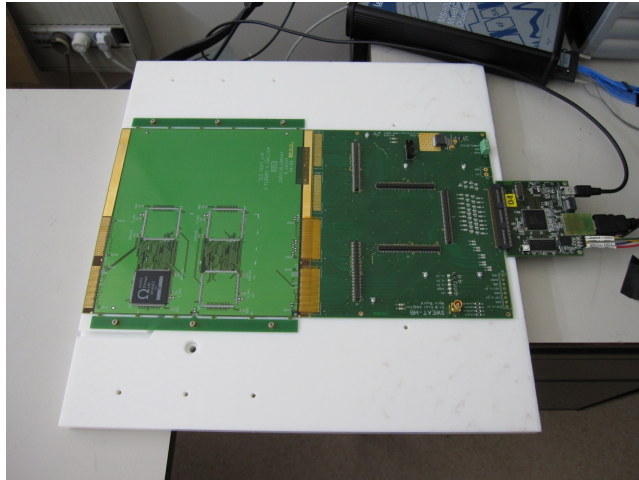


SiW Ecal

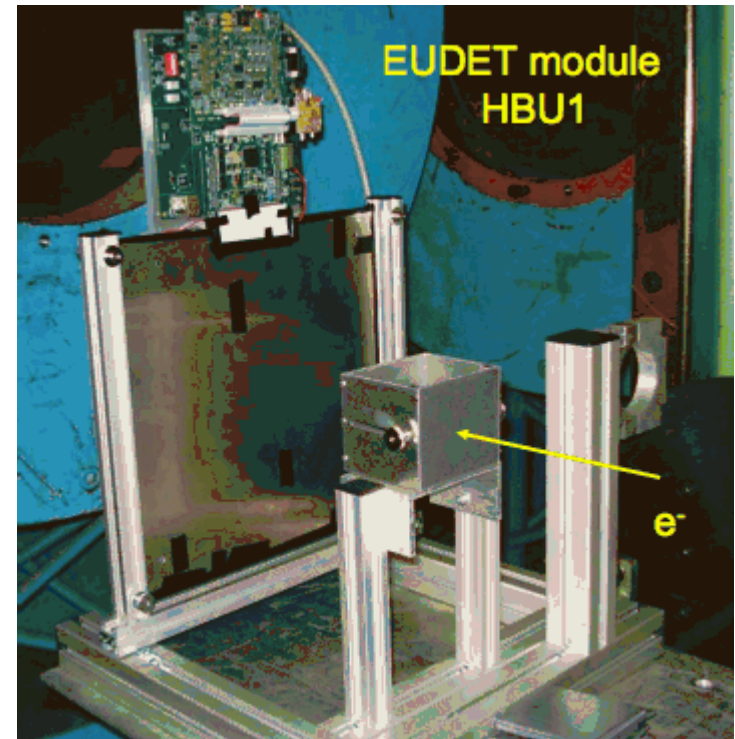
- Demonstrator for feasibility
- Full structure in production can also be used for ScintEcal

Development of Readout Electronics

Prototype of VFE



- Progress in VFE Electronics
 - SKIROC Chip available
 - Corean partners for FEV8 board
 - Tests with SPIROC and FEV7 (ASU by end of 2010)
- Progress in DAQ.
 - Communication to DIF via LDA
 - communication with VFE under development
- SiW Ecal Layers during 2011
- Testbeam towards end 2011
early 2012
Progressive tests



- Characterisation of Front end electronics
 - Tests of autotrigger
 - S/N ratio
 - Difference Test bench/Beam

Continous small beam tests at DESY

Collaboration SiW-Scint Ecal Initiated by TB-Review Meeting

**Composite Part
with metallic inserts
(15 mm thick)**

Thickness : 1 mm

182×9,4 mm

182×7,3 mm

186 mm

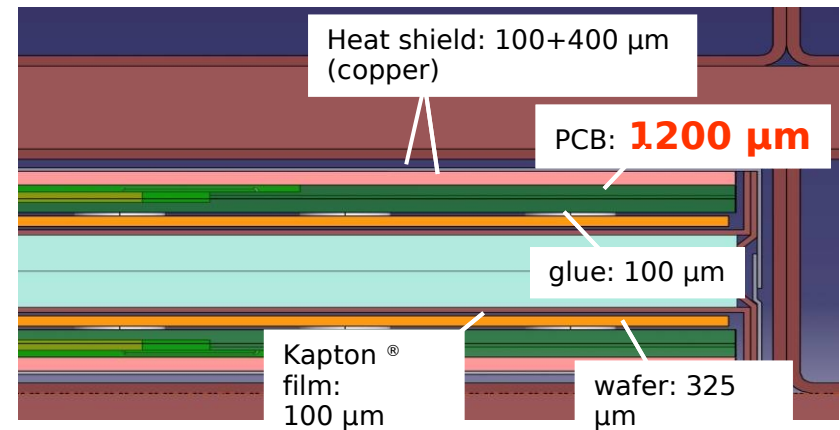
545 mm

**Composite Part
(2 mm thick)**

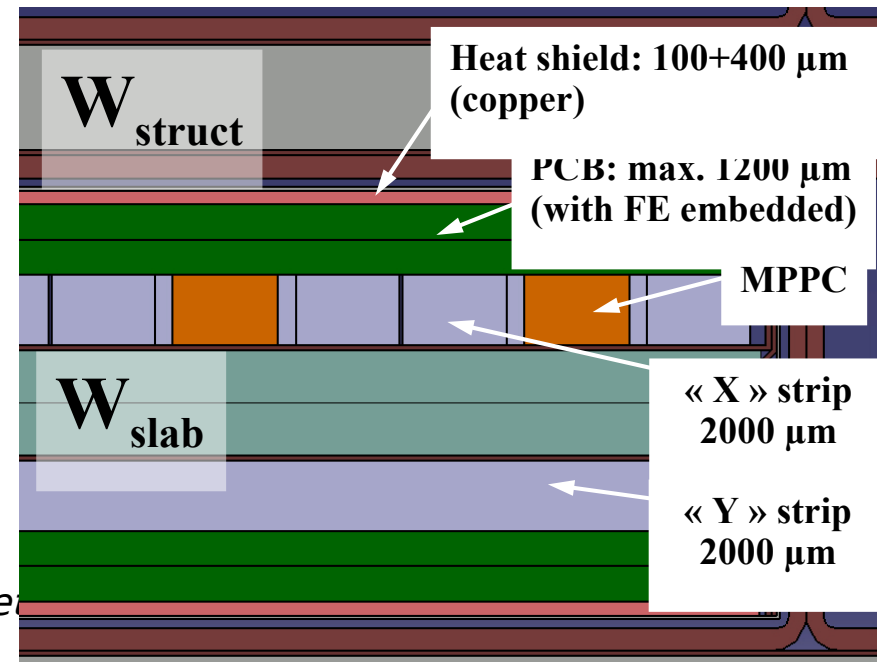
- Alveolar structure applicable for both Ecal proposals
- Details on integration are currently worked out.

Communication SiW Ecal-ScintEcal-DESY

- Schedule to be precised in coming months



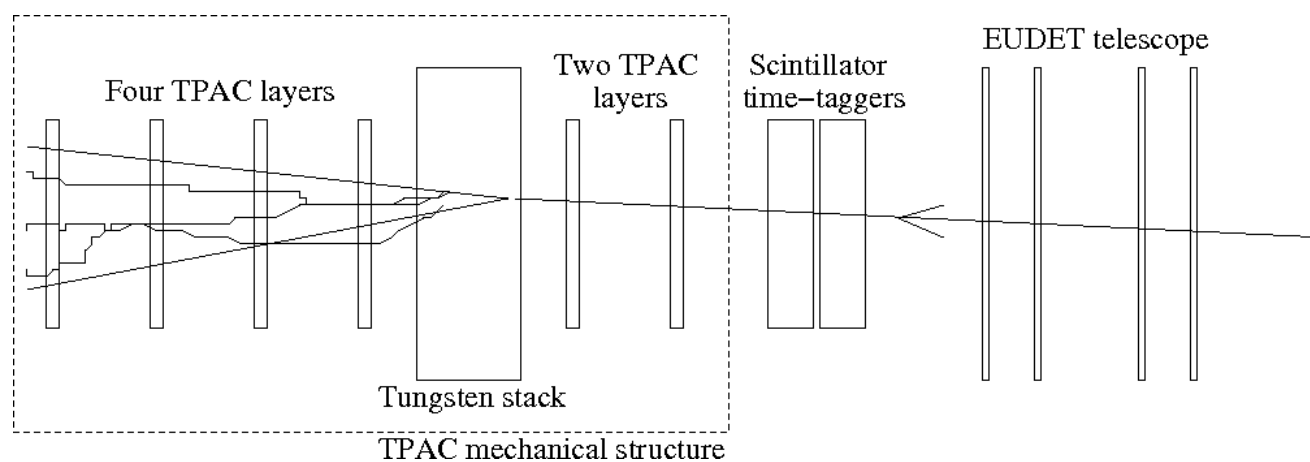
ECAL W/Scin



SPIDER

- Silicon Pixel Detector R&D
- Remnants of CALICE-UK DECAL group and LCFI
- “Generic” pixel detectors for future colliders

DESY Testbeam March 2010



- Efficiency for different sensor variants
- Shower densities in electromagnetic showers
- Program stopped due to UK funding disaster

Project will remain observed by TB

DAQ system overview

(Detector Unit : ASICs)

DIF : Detector InterFace connects generic DAQ and services

LDA : Link/Data Aggregator fans out/in DIFs and drives links to ODR

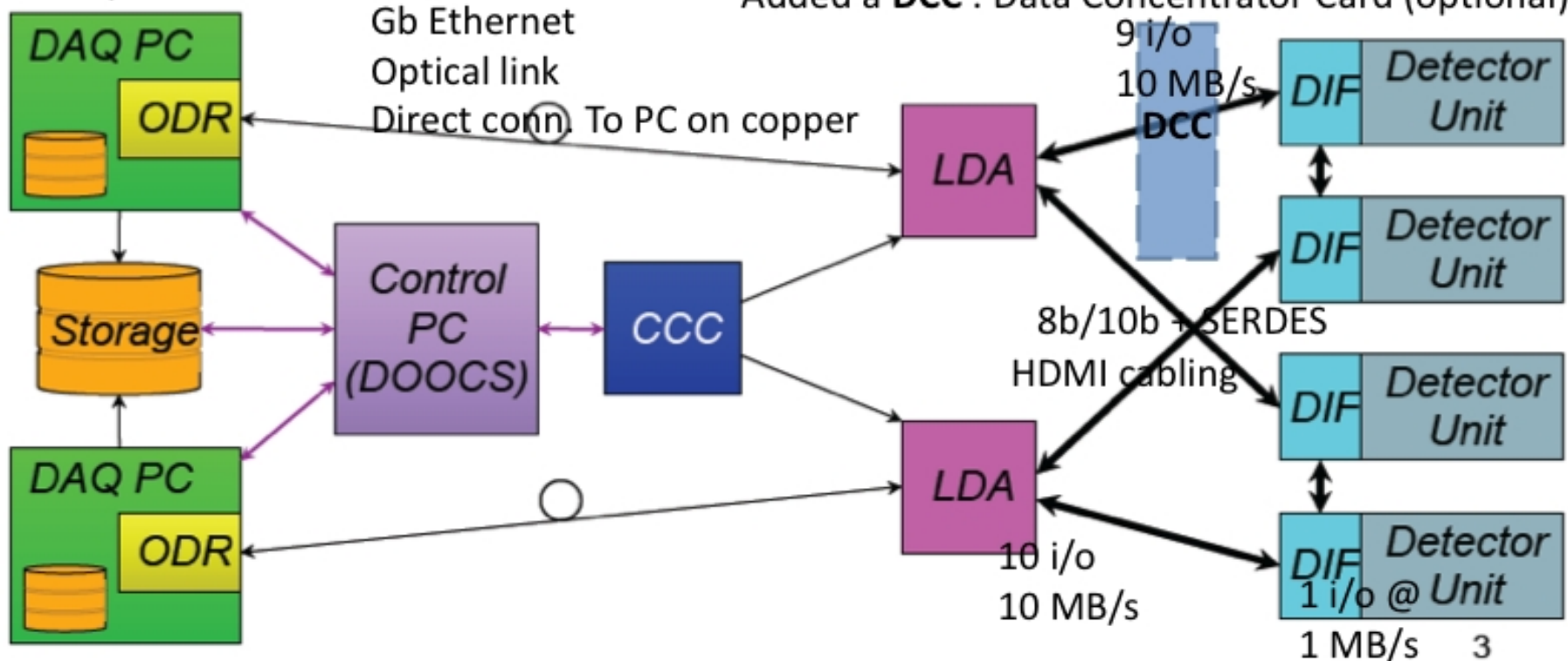
ODR : Off-Detector Receiver is PC interface

CCC : Clock and Control Card fans out to ODRs (or LDAs)

Control PC : Using DOOCS

200 MB/s on disk

Added a **DCC** : Data Concentrator Card (optional)



Status of DAQ for Technological Prototypes

- Hardware provided by UK groups – Now start of operation

Drop out of UK groups essentially caught by french groups

Transfer of information works smoothly (still clearly deplorable situation)

Remarkable effort of UK groups to remain in business

- SDHCAL DAQ

1m² prototypes of the SDHCAL are read out by USB based DAQs

About to complete step towards Ethernet/HDMI DAQ

Firmware of LDA (can serve 6 connections to DIF as of July 2010)

Communication to ROCs (waveform generated e.g. for SPIROC Chips)

Communication with HARDROC?

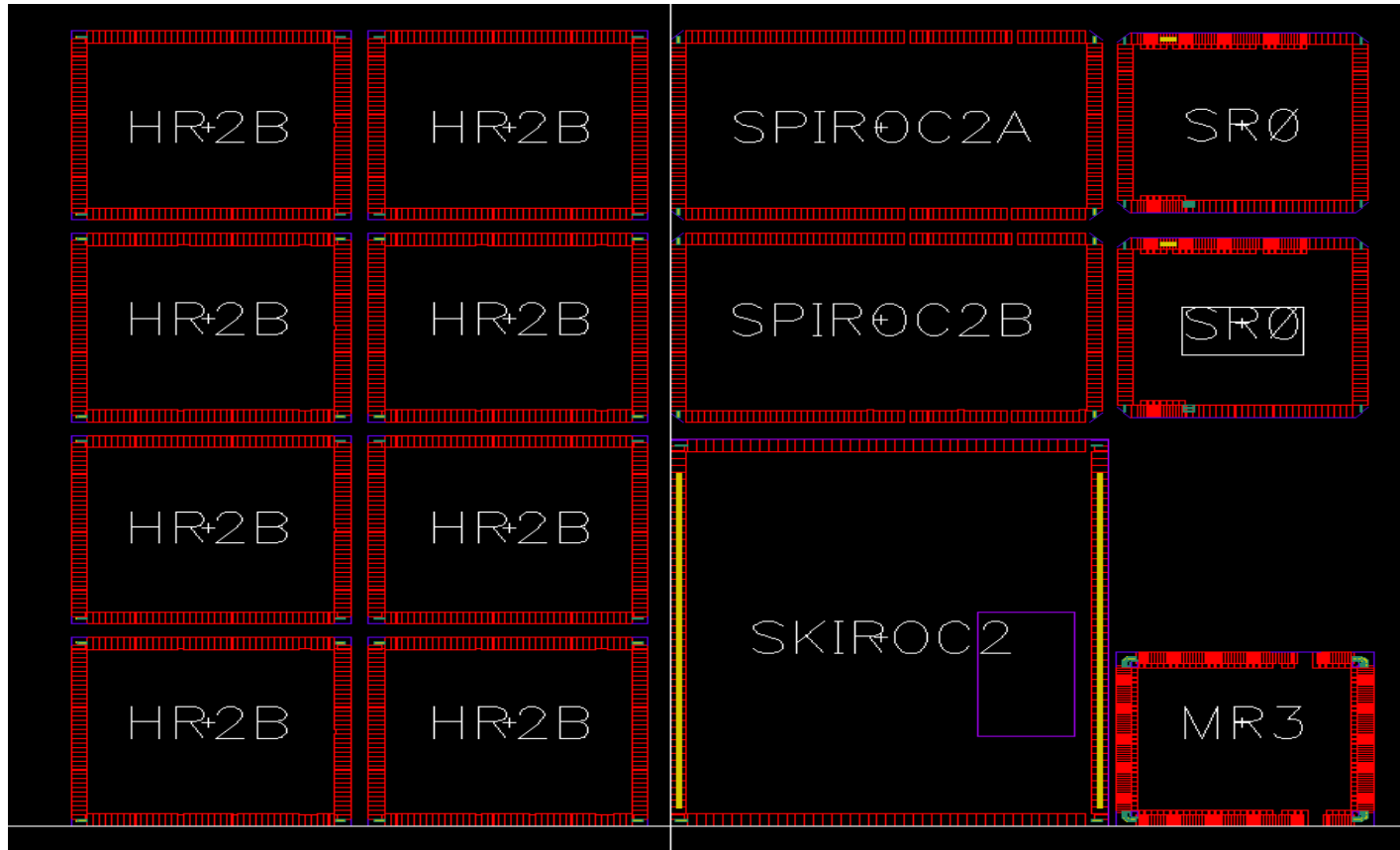
- XDAQ will be s/w frame for DAQ

Decision taken in TB end of July

SiW Ecal and AHCAL need to adapt

Status of FEE

- Production Run March 2010 – Returned end of July, now packaging
- Reticle : 22 x 18 mm², 50 reticles per wafer
- 25 wafers produced,



- SKIROC for Ecal is integrated

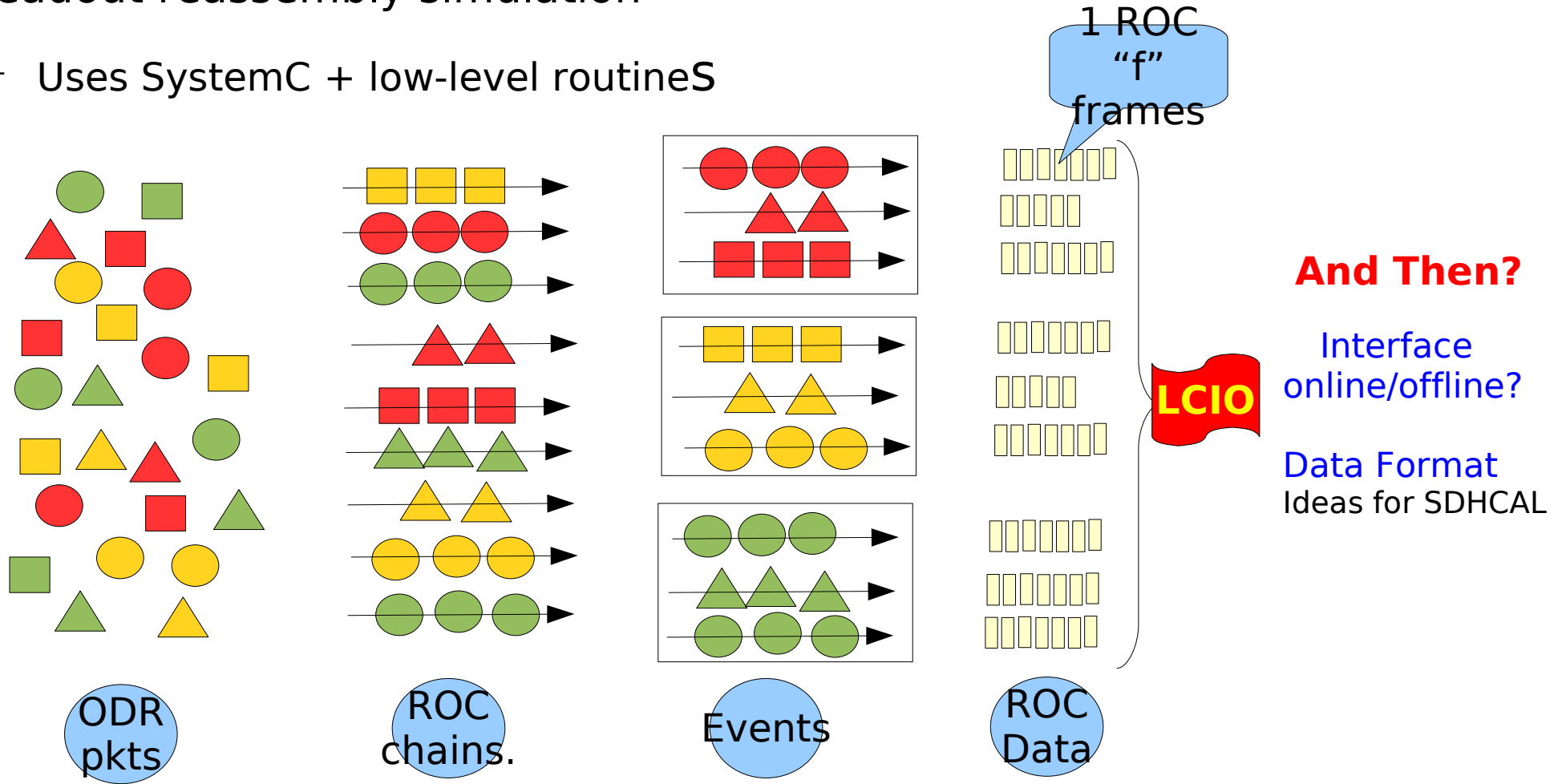
=> Back in phase with other chips <-> Compliant with TB Review
More details in Electronics Session

CALICE Software

- Software coordinator Angela Lucaci-Timoce
- Contacts for subdetectors:
 - SiW Ecal: K. Krastev, R.Poeschl
 - ScintEcal: Cotera (?)
 - AHCAL: Angela herself
 - (S)DHCALS: ??? (Fate of task force initiated by Niels)
 - TCMT: K.Francis?
 - Tracking: P. Dauncey, D. Jeans (?)
 - Simulation/Mokka: G. Musat
- All physics prototypes are implemented in Mokka
SDHCAL GRPC as well
- Data processing:
 - Support by M.S. Amjad, D.Jeans, A. Kaplan, K. Krastev, N.Feege, L. Weuste and S. Lu
 - Data processing on request
- CALICE s/w needs to be put on broader basis
Efficient s/w group is essential for publishing physics results

Towards s/w for Technological Prototypes

- Readout reassembly simulation
 - Uses SystemC + low-level routines



Scheme by D.Decotigny (LLR)

Needs tight communication between DAQ team, CALICE Software Team and ILC Coresoftware Team

Planning 2011 and Beyond

- Beam test plans 2011
 - > Tests at CERN, DESY and FNAL
 - > See dedicated testbeam session on Friday

- Detailed planning should take dead line for DBDs into account
DBDs to be published during 2012

- Need considerable resources in 2011
CERN (and FNAL?) will be shut down during 2012
Need to make sure that our program can be conducted
Request to SPSC issue at the TB Meeting in Casablanca
CALICE (maybe) needs to define priorities (Steering board issue)
Where possible flexible beam test plans

- CALICE report on detector technologies
 - Requires dedicated TB review meeting
 - **Schedule and criteria** to be defined by steering committee

Summary and Outlook

- CALICE continues to have a rich R&D program and enters a phase in which challenging technologies for (I)LC faces their realisation
It is explicitly in the interest of CALICE to investigate several detector technologies
- Landscape is very heterogeneous
8 different technologies (absorber or sensitive medium)
Several large scale prototypes will run in parallel
- TB will continue to monitor all efforts and streamline activities
 - Completion of physics prototype phase in sight
 - Start to shift priority to technological prototypes
- TB will be in first line to realise longer term planning
 - Availability of testbeam lines
 - **All** beam test efforts should be launched via TB (or at least TB needs to be informed)
- TB will support steps towards DBD
 - Priority list
 - Agreement needed on steps towards Calice report on status of technologies