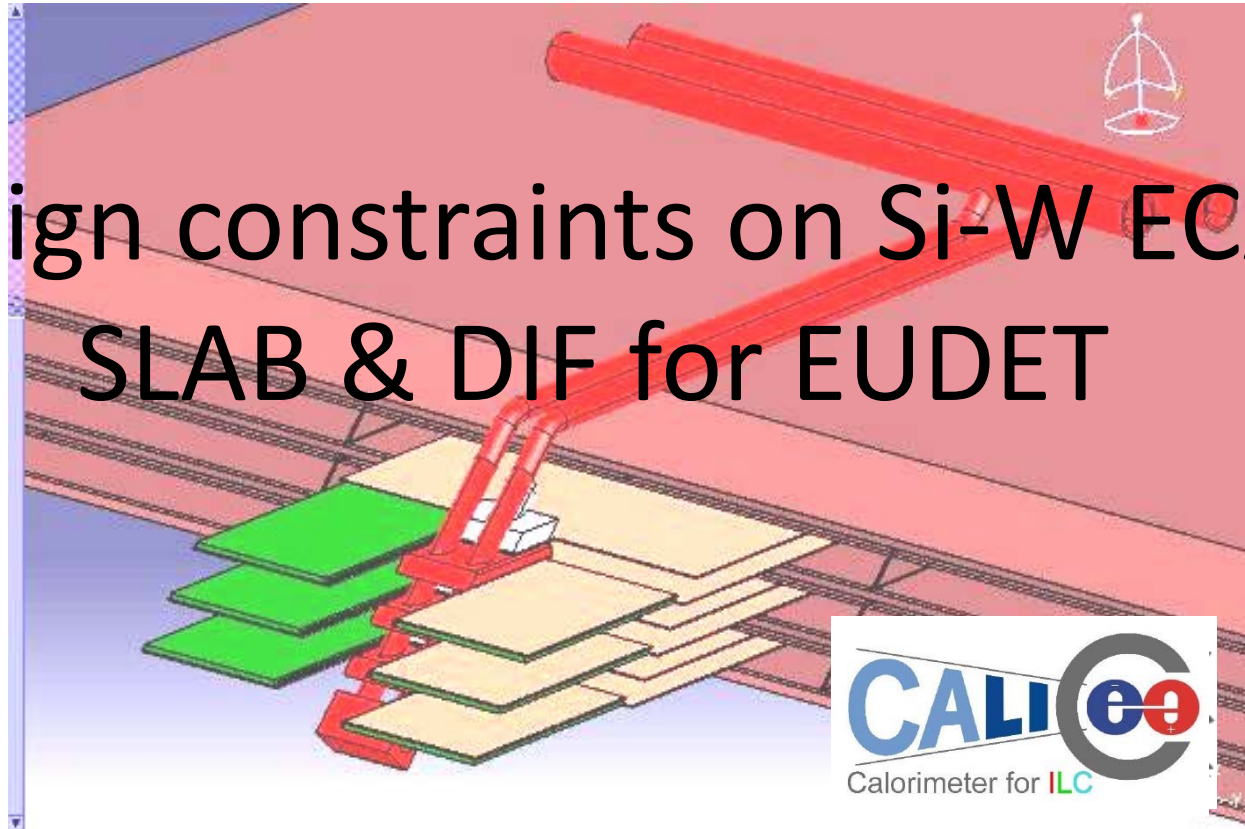


Design constraints on Si-W ECAL SLAB & DIF for EUDET



Existing DIF hardware

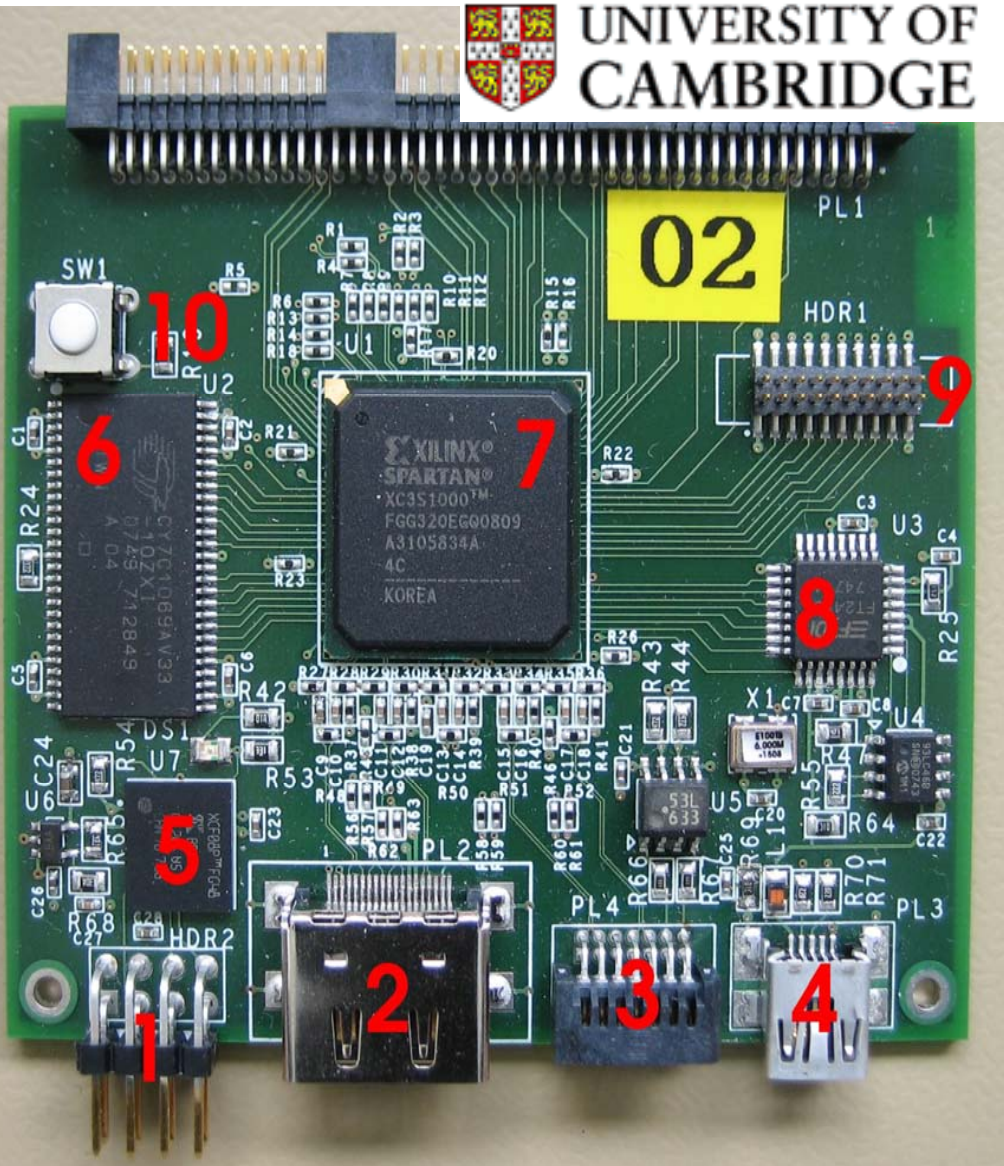
Maurice Goodrick, Bart Hommels



ECAL DIF prototype: 65x72mm, 8 layers

1. JTAG programming header
2. LDA link HDMI connector
3. DIF link connector
4. mini-USB connector
5. Xilinx PROM
6. Cypress 2MB 10ns SRAM
7. Xilinx Spartan3-1000 FPGA
8. FDTI FT245R USB controller
9. 20p user header connector
10. reset pushbutton
11. 90pin SAMTEC IB connector

A great effort made on integration
 Minor adjustments for EUDET :
 power supply connectors & decoupling

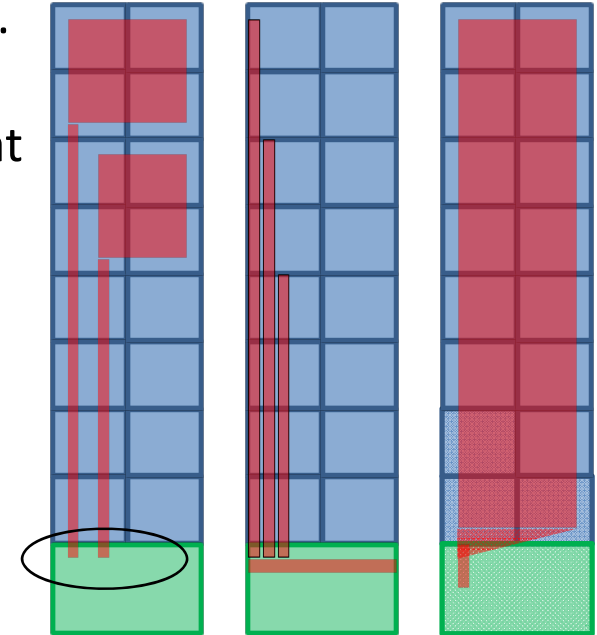


29-07-2008 CALICE EDAQ, LLR Paris

High Voltage

Kapton Film but need to be able to un-mount ASUs...

- 1 Kapton/halfASU = up to 16 ribbons
 - Each ribbon must be folded in a different way at DIF side
 - Then connected to HV, no room on DIF!
 - Each ribbon can be decoupled (best for noise)
 - Small surface contact
- 1 Kapton/SLAB not soldered
 - Easy to mount/unmount
 - Contact quality ? If not soldered...
 - Embossed ?
 - Decoupling at SLAB level

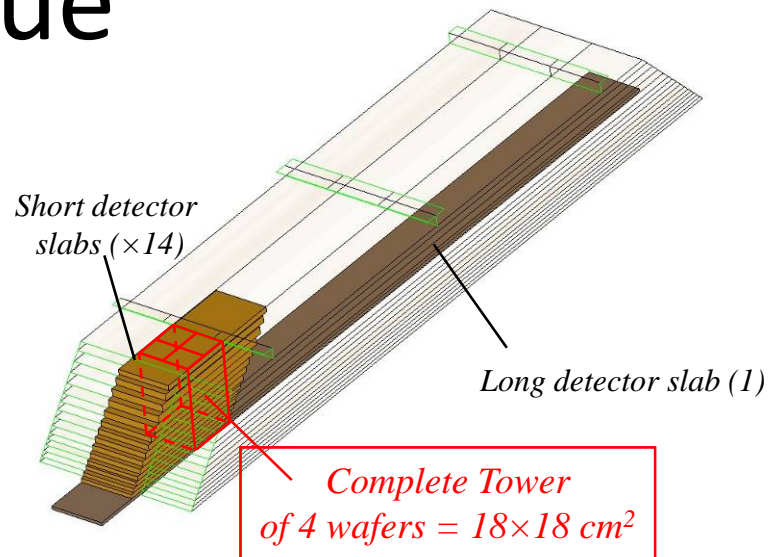


Nothing has been tested yet

What about DIF or AdapterCard side ?

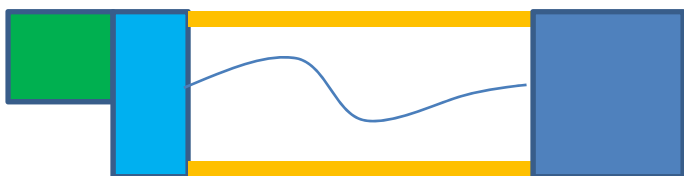
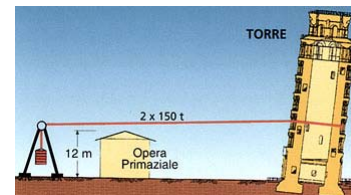
Tower issue

The structure is cut with a 45° angle
 If the short SLABs have the same length
 (made from identical components), the
 tower will be tilted compared to the long
 SLAB !



No matters for EUDET except for some physics runs ?
 In any cases : precise location of each SLAB must be know

If a perpendicular tower is required :
 To the beam : rotate the detector (change the sampling ratio,
 what about other detectors?)
 To the long SLAB : issue!



Connectors and cabling

Where are located the low & high power connectors : DIF or Adapter card ?
 Low power operation (Demonstrator mode require a huge capacitor few mF !)
 BZ05 case : 20mm x 15 mm x 6 mm (10 mF, <http://www.farnell.com/datasheets/89342.pdf>)

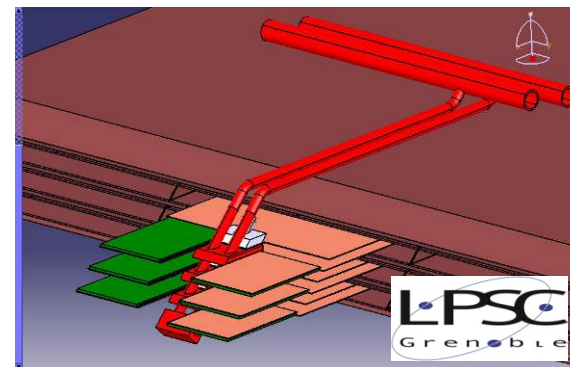


Tensile due to cables or to users cabling cables ?
 Absorbed by connectors ?

Paths ? And trays ?

- Power : along the cooling pipe, bus topology
- Data : to/from LDA, path according to LDA location, most preferably going to the top of the detector

Suppress connector (at one side of cables = DIF) +
 slack cable ? Would prevent users (physicist) to
 put fingers inside the electronics.



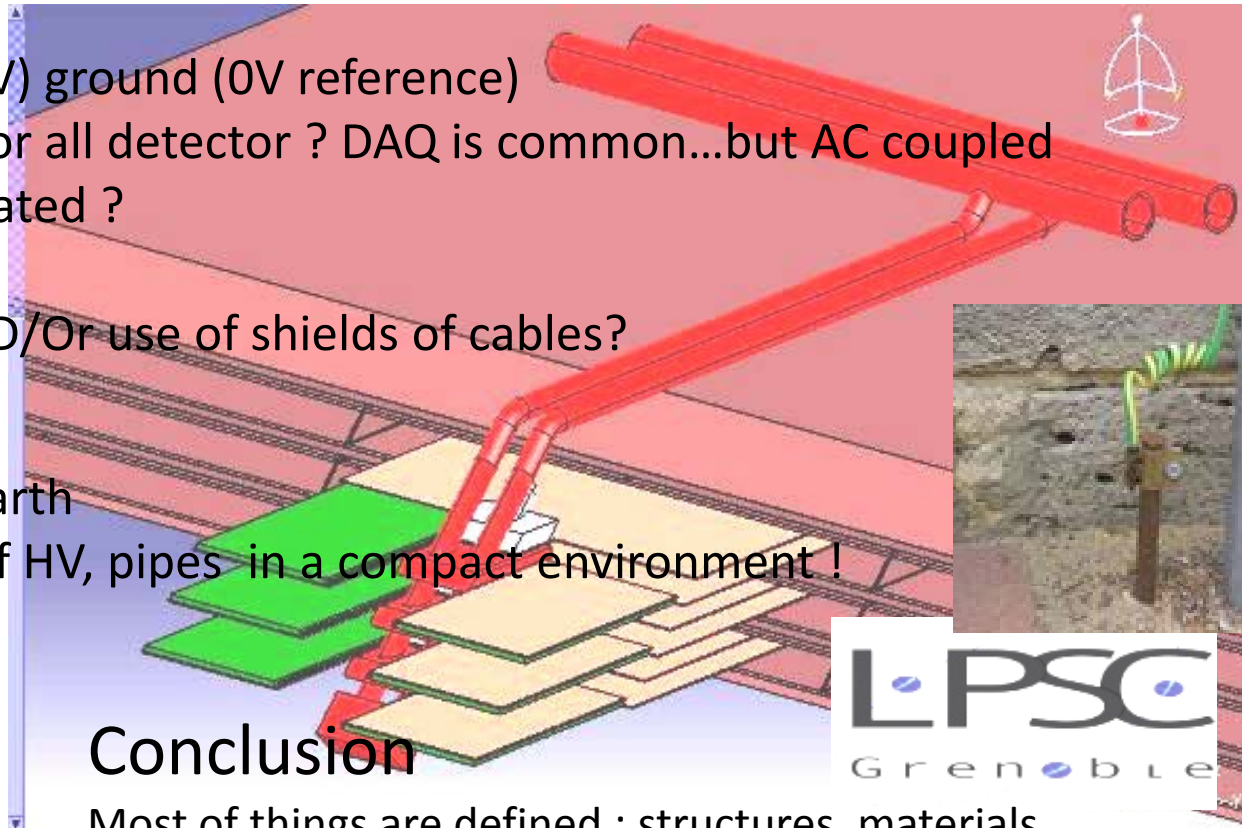
Grounding policy

Electrical (LV) ground (0V reference)

- Common for all detector ? DAQ is common...but AC coupled
- Kept separated ?
- Path ?
- Braid ? AND/Or use of shields of cables?

Chassis / Earth

Presence of HV, pipes in a compact environment !



Conclusion

Most of things are defined : structures, materials,...
But the actual use of the detector lead to ask some
questions about cabling, grounding, tower