CALICE input to DBD

Update (since Shinshu/Matsumoto meeting) on Si-W ECAL

Daniel Jeans, LLR

CALICE pre-meeting, ILD workshop, Kyushu, May 2012

DESY test beam (march/april 2012)

first SiW technological prototype beam test

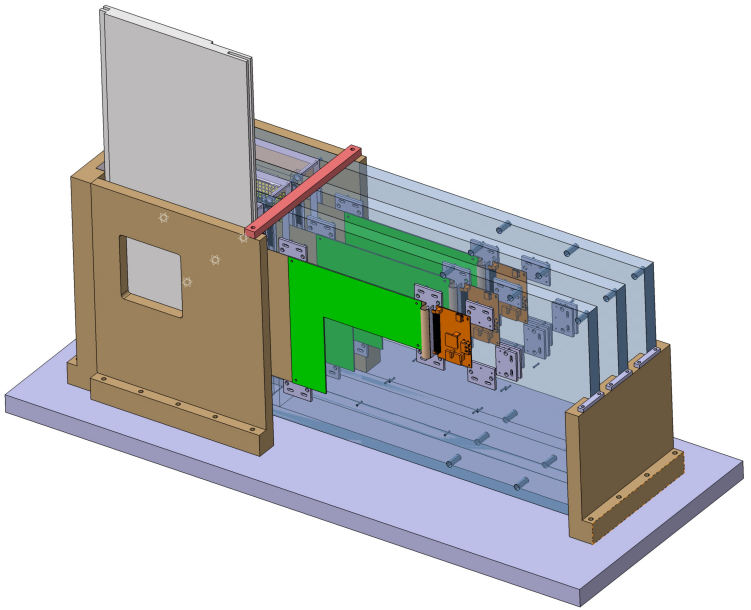
- sensor with 5x5 mm2 pixels
- SKIROC2 ASIC (packaged)
- FEVx board (partially instrumented, relaxed thickness requirements)
- adapter board
- full DAQv2
  - ECAL DIF, LDA, CCC (including new version from Mainz)

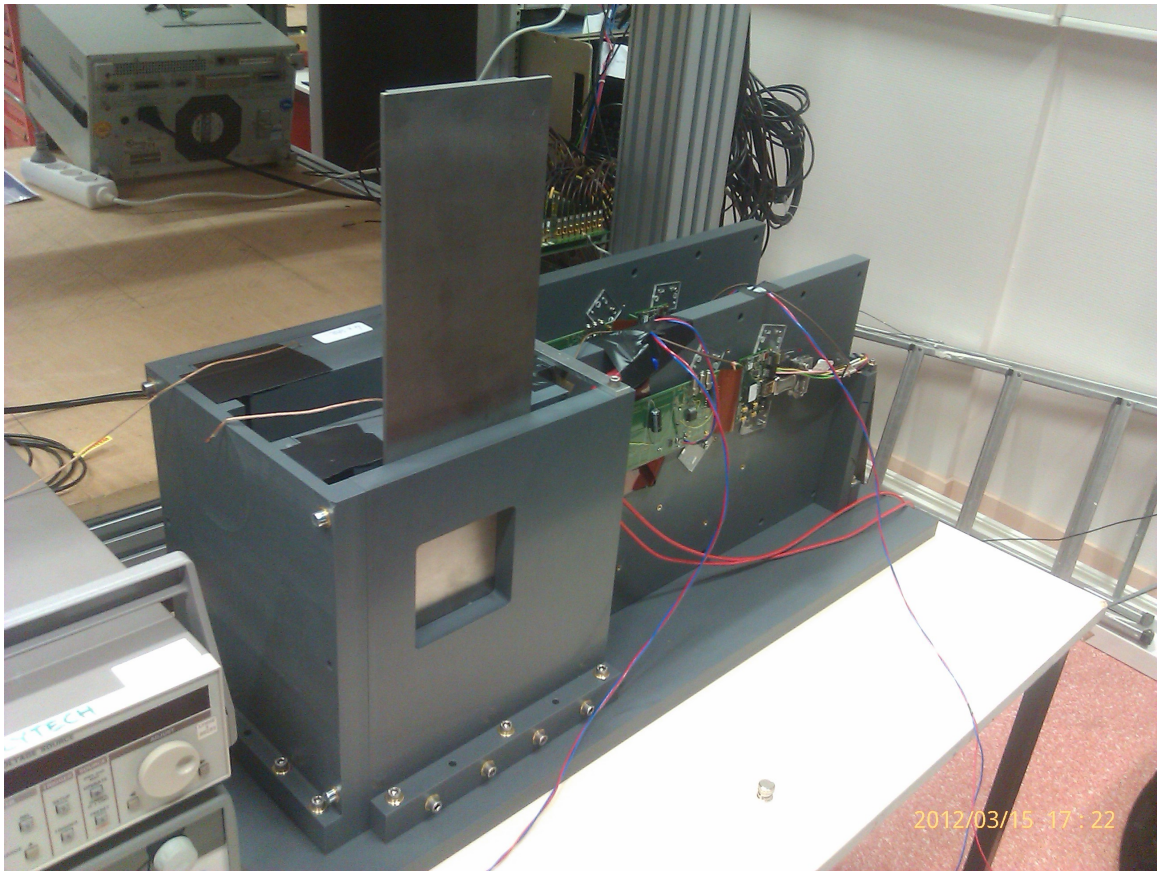
- several elements received only ~2 weeks before beam test...
  - ...only limited system tests in lab

4 ASUs: 2 SKIROC2 equipped, 2 SPIROC2 (backup)
Possibility to interleave tungsten plates: put sensor at shower maximum

One SKIROC2-equipped sensor broken and
un-usable by start of tests (probably broken in lab)

Most of tests concerned remaining SKIROC2 ASU
mostly 3 GeV e- to maximise rate

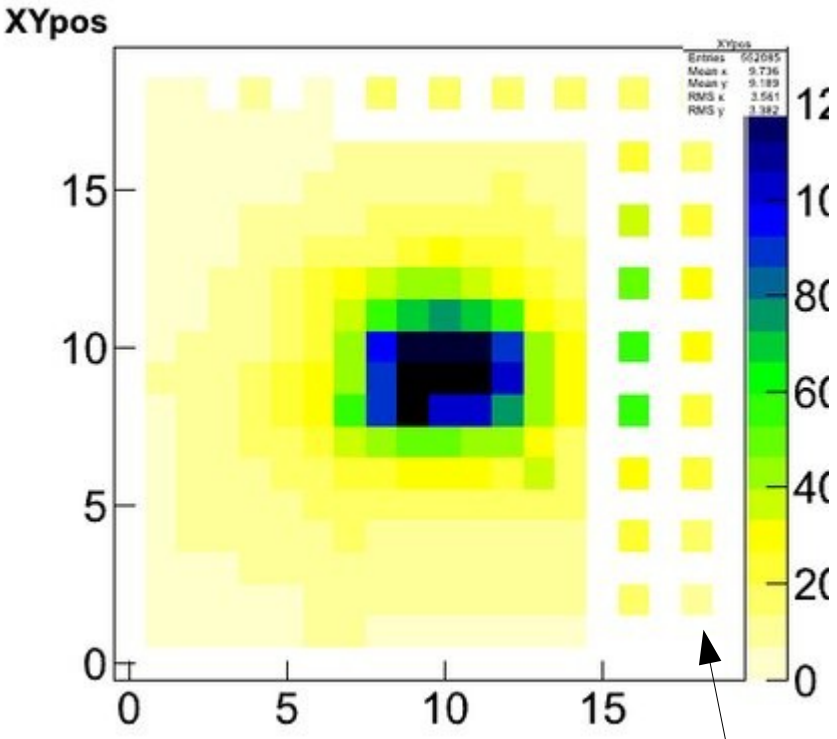


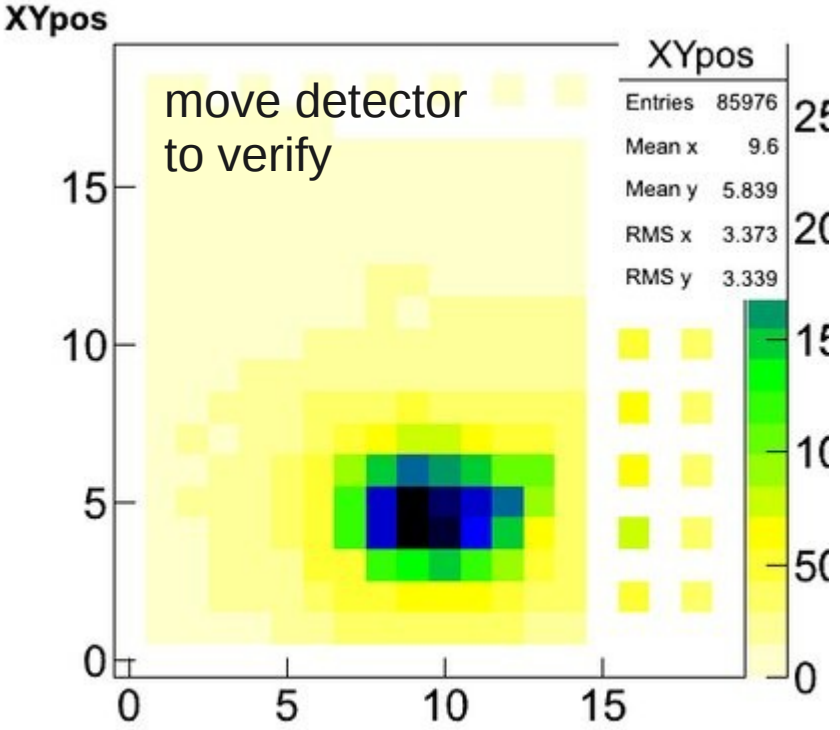


First real test: see beam spot at shower maximum

1 x SKIRO2 ASU, auto-trigger mode

Count hits above threshold too see beam spot



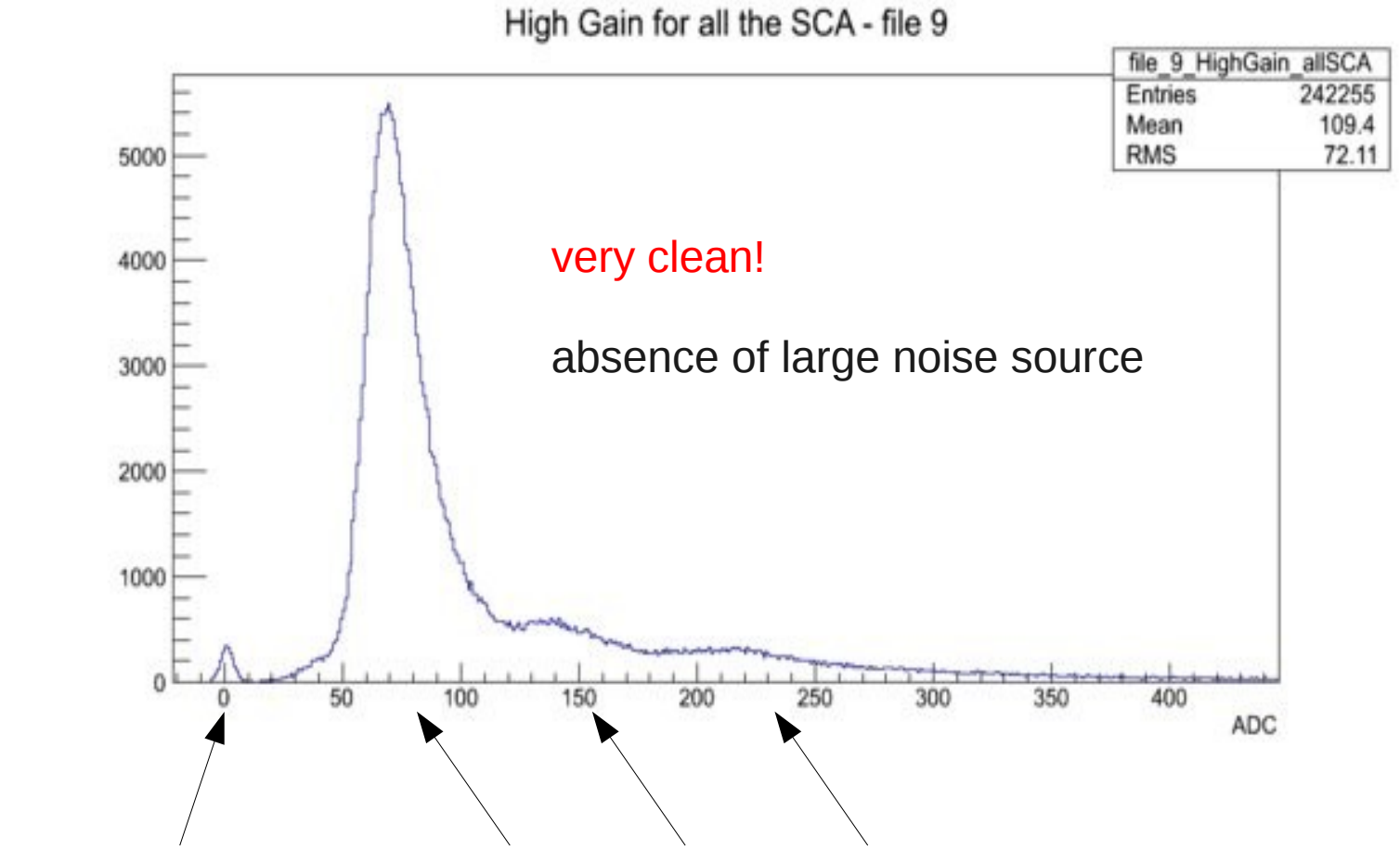


Some pixels grouped:
read out by single channel
Sensor has 18x18 pixels,
ASIC has 16x16 channels

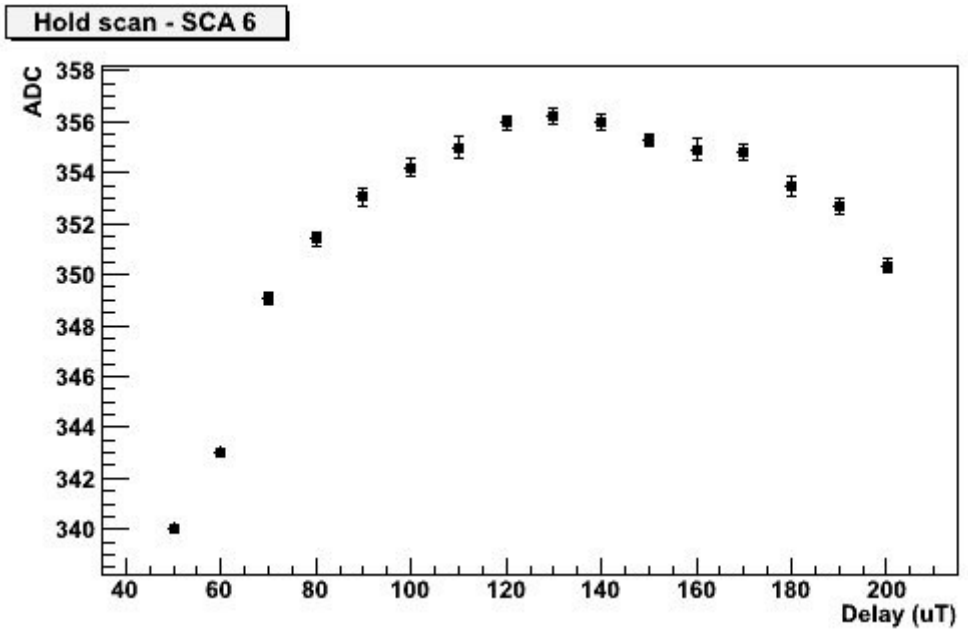
Then focus on single channel: mask all others

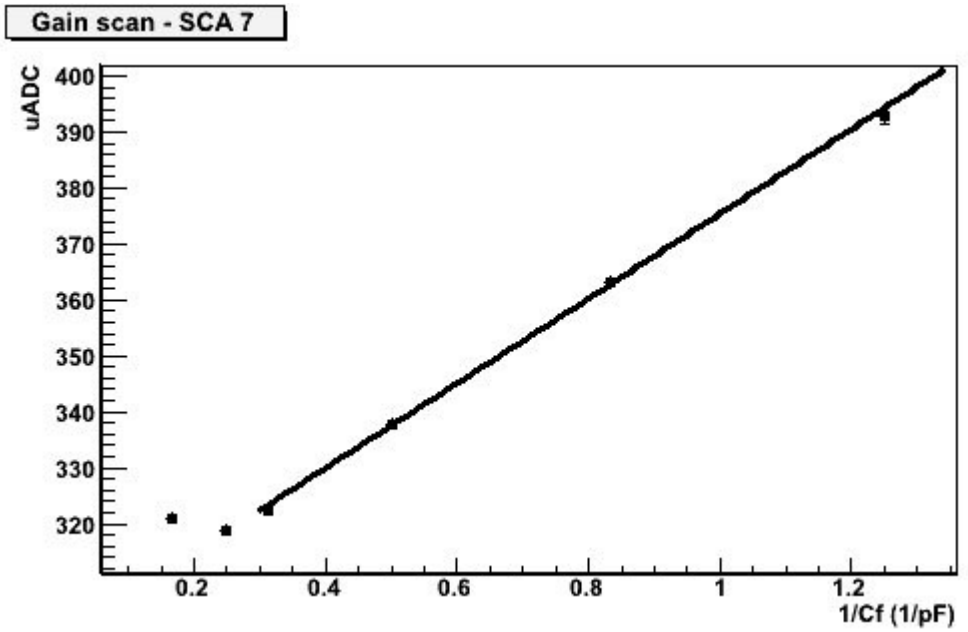
Choose favourable channel
(short route on PCB, less chance of cross-talk)

No tungsten absorber: single particle spectra



hold and gain scans
(single pixel configuration)





Useful testbeam period somewhat curtailed by breakage of second SKIROC2 sensor
similar to first failure: unsuitable mechanical constraints in ad-hoc slab

Test succeeded to validate entire detection chain

Further tests planned for July: 5 – 10 SKIROC2-equipped ASUs
Improved mechanical integration should eliminate breakages
Improved software to streamline operations

Will provide further input to DBD:
operation and calibration of “large” (~1000) number of channels

Simulation studies

Two studies on layer structure of ECAL

- Pandora jet energy resolution with different ECALs
- Both are work in progress,
  - should have first results for inclusion in DBD

si layers - T.H. Tran, LLR

- compare 30, 26, 20 silicon layers

Hybrid ECAL (more details later) – mostly Kyushu U.

- mix of silicon & scintillator layers