AHCAL Electronics.

Status and Outlook

Mathias Reinecke
for the AHCAL developers
CALICE week Lyon
IPNL, Sept. 16th – 18th, 2009

HELMHOLTZ GEMEINSCHAFT

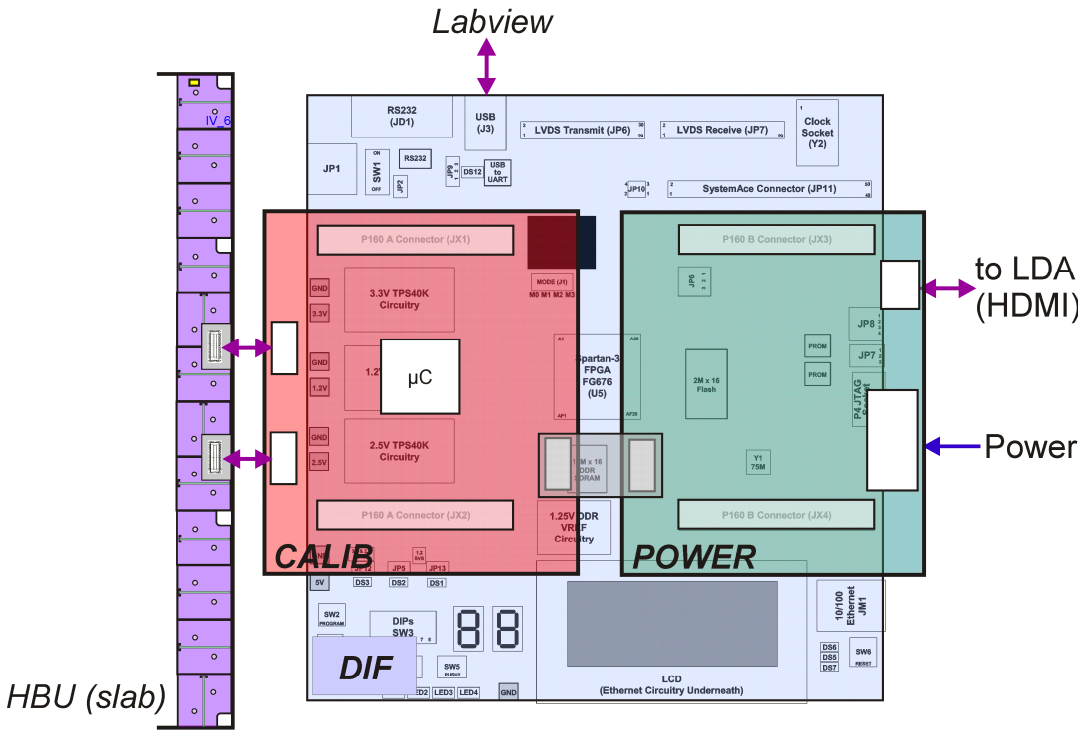
CALICE Calorimeter for ILC

EUDET

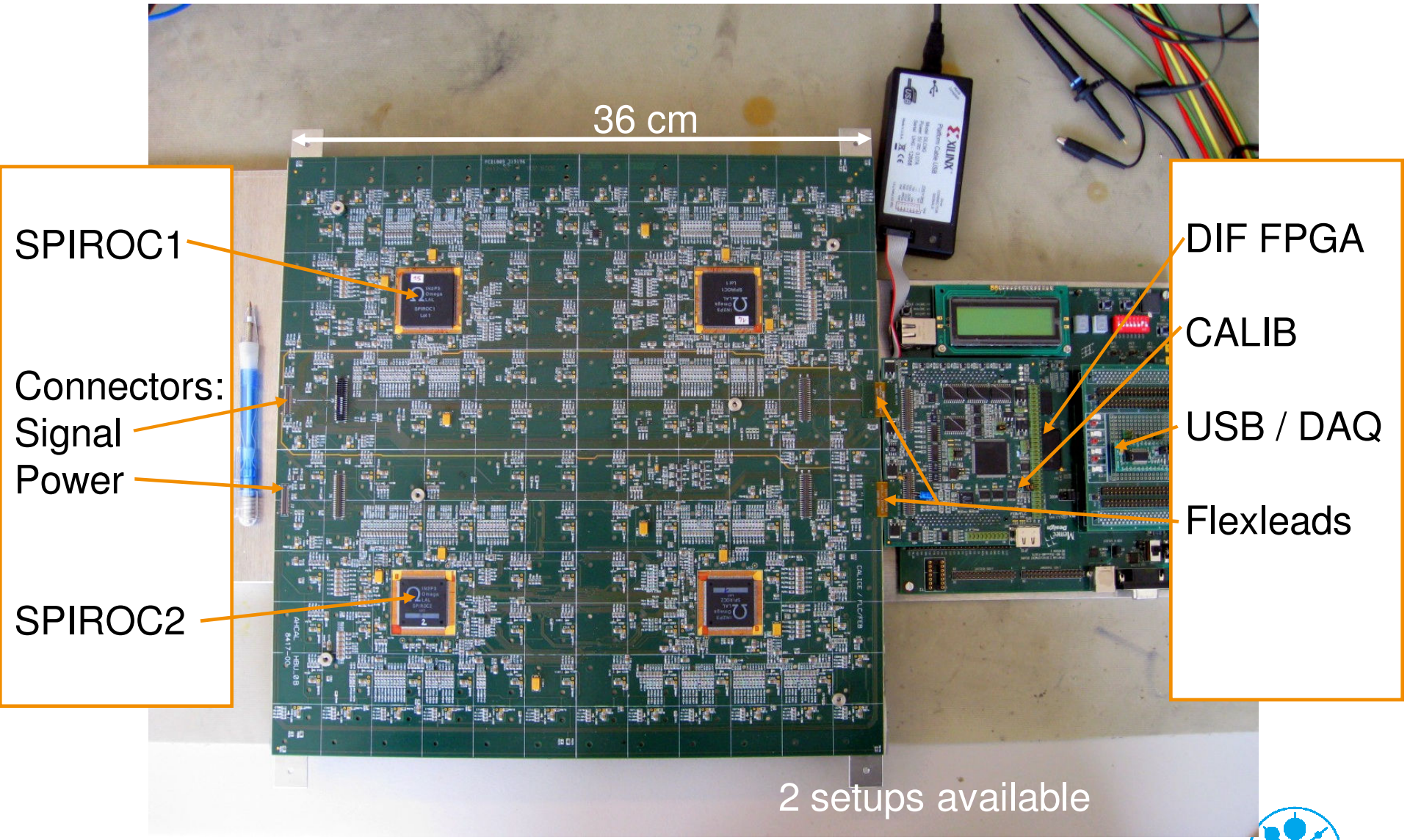
DESY

Outline

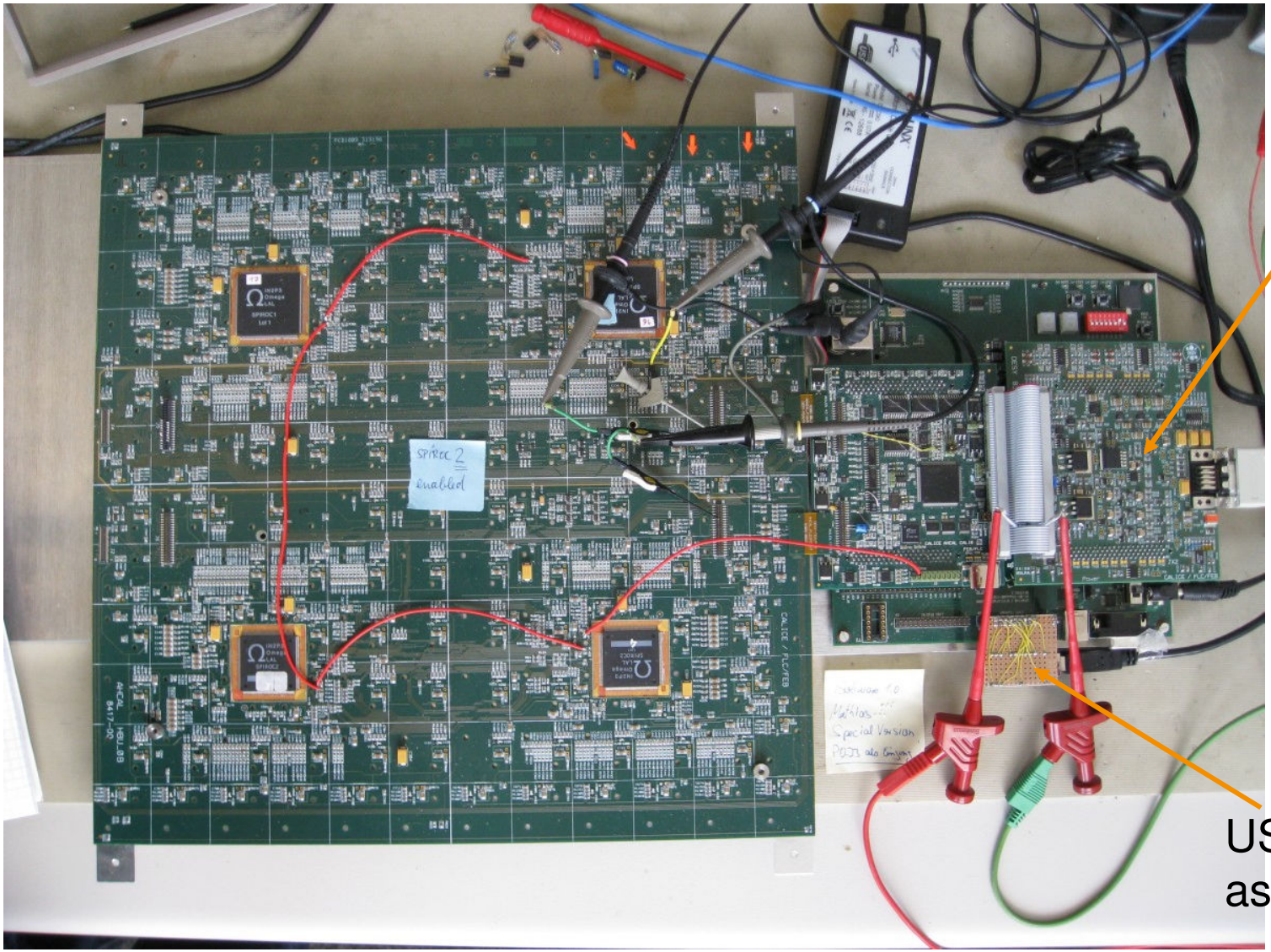
- Introduction
- DIF and Electronics Status
- SPIROC Analogue Tests



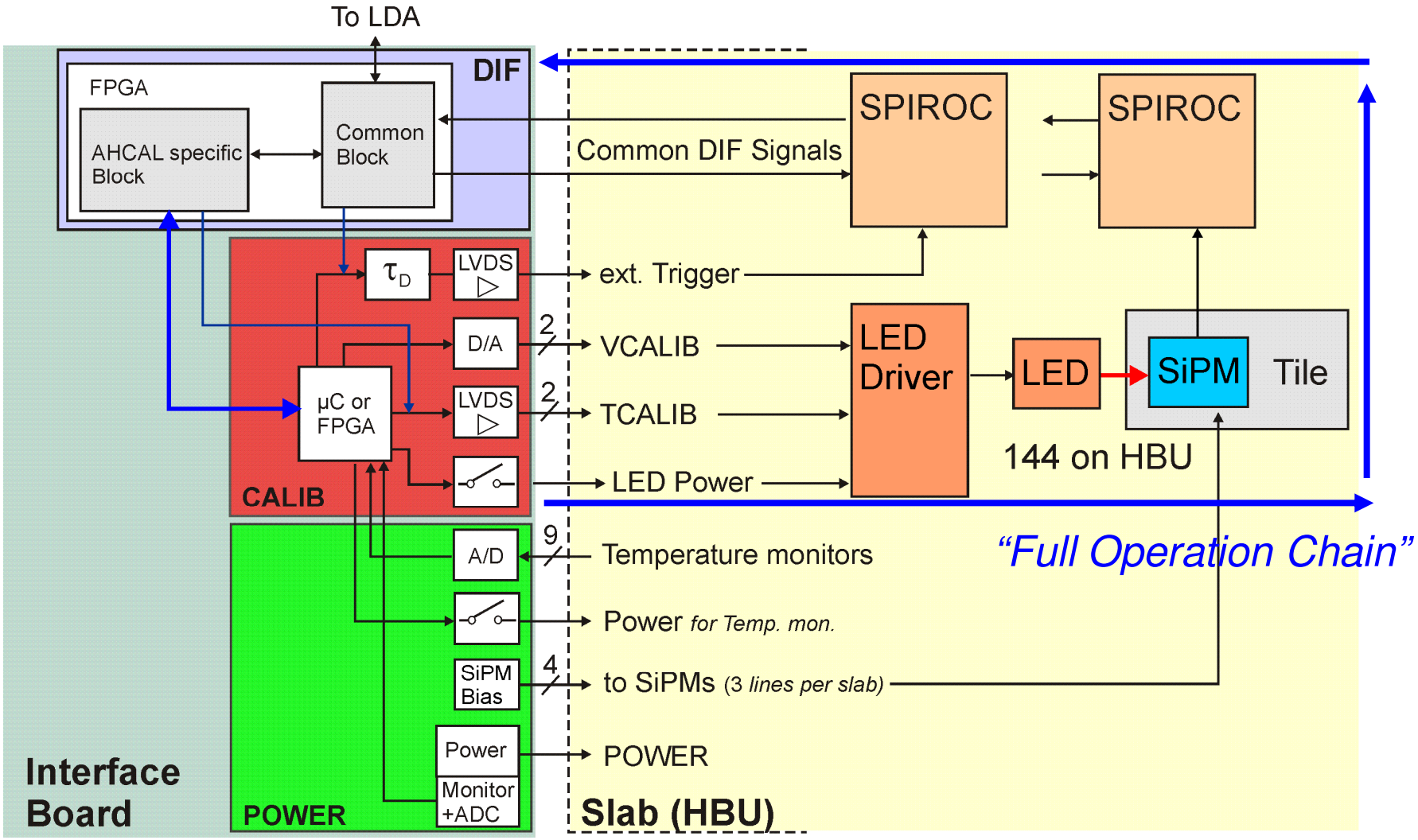
HCAL Base Unit (HBU) setup



HCAL Base Unit (HBU) setup - reloaded



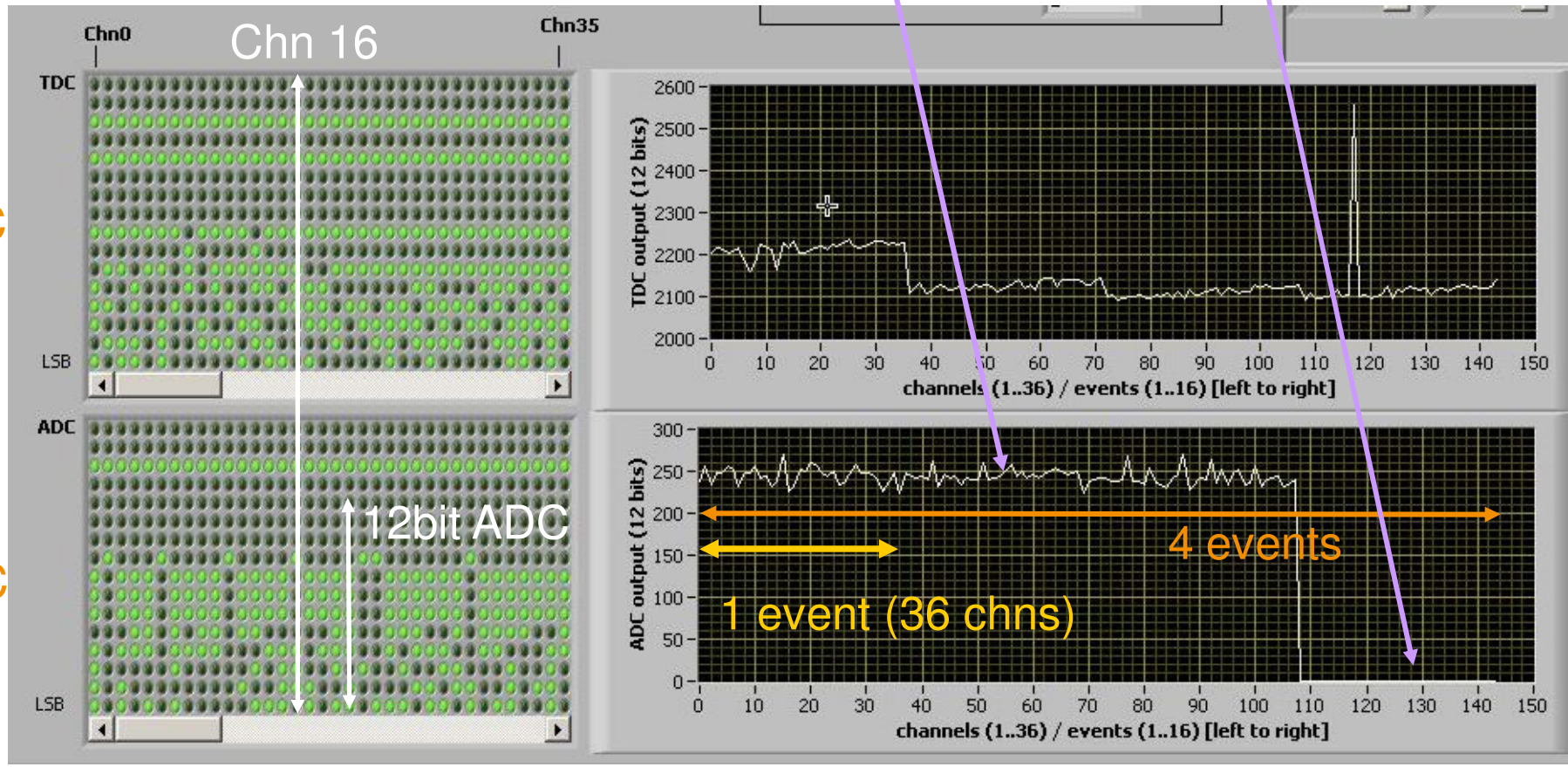
Commissioning – Signal Chain for LED operation



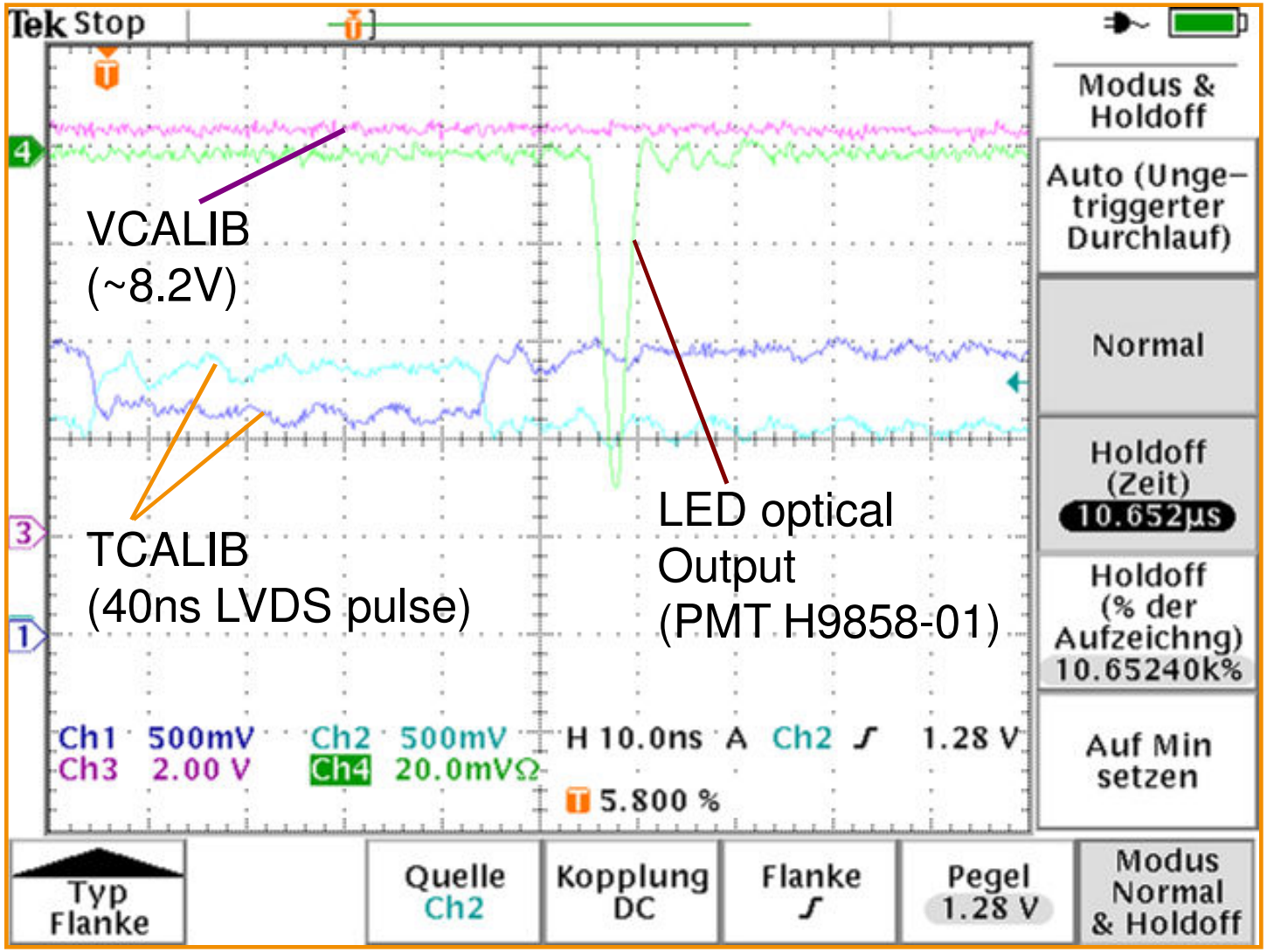
Concept : December 2007

Commissioning

SPIROC2 output: No LED signals – baseline for 4 events (triggers)

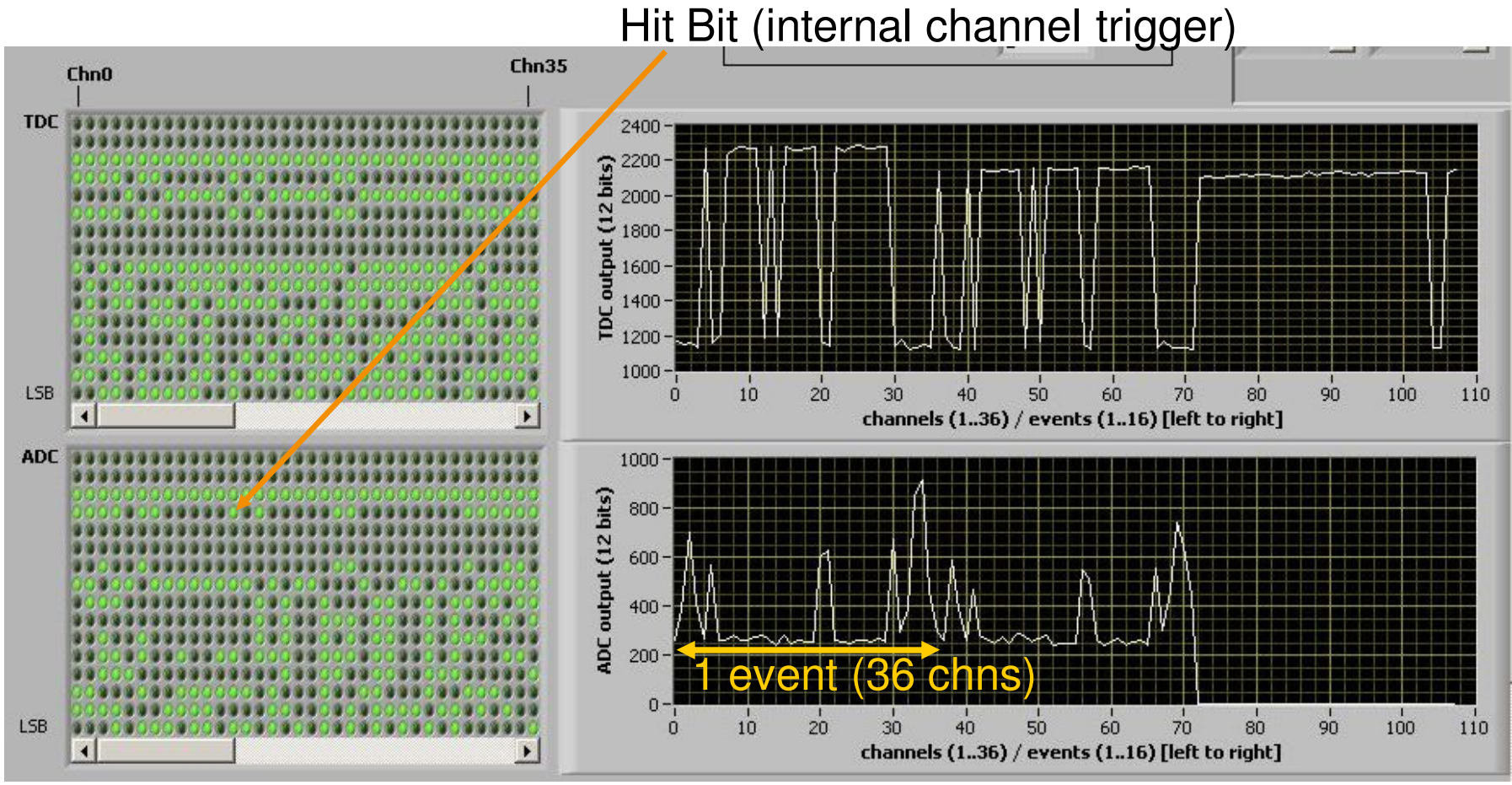


LED Pulse shape (measured on HBU)



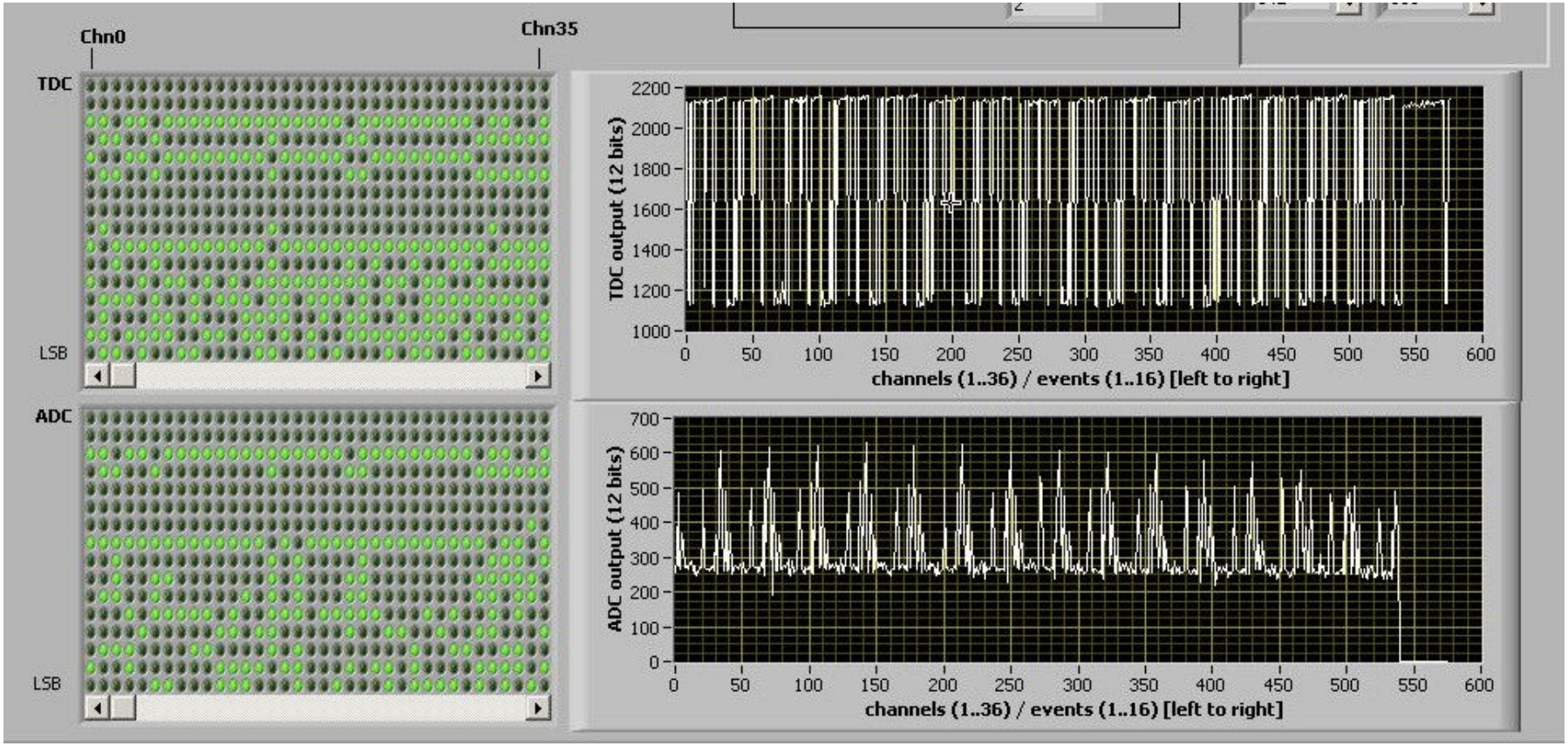
Commissioning (status last Friday)

SPIROC2 output: LEDs firing, 3 events (triggers), 18 tiles assembled



Commissioning (status last Friday)

SPIROC2 output: LEDs firing, 16 events (triggers) in 62.5kHz rate



Charge Injection (2nd calibration possibility)

In Readout Data:

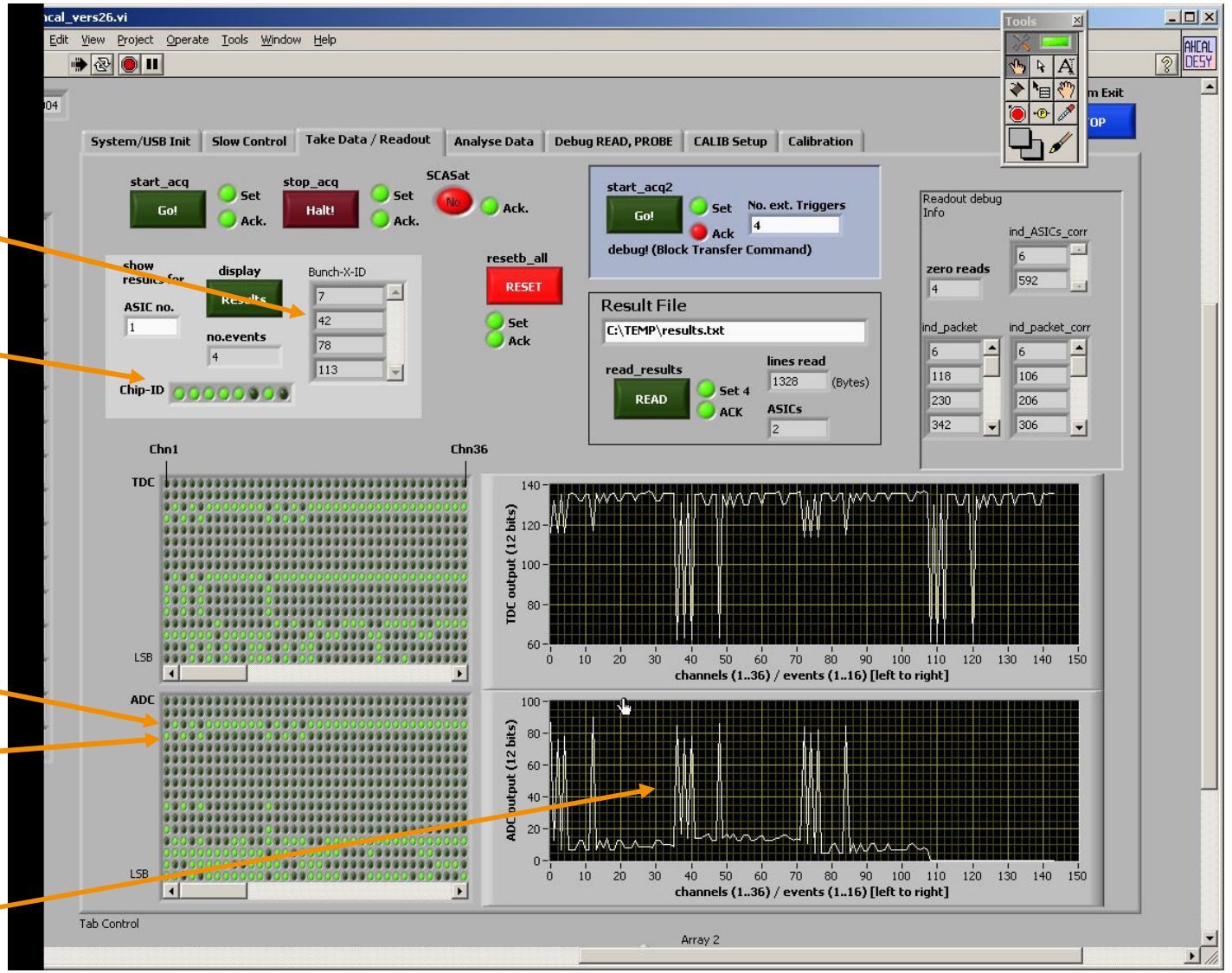
Bunch-X-ID

Chip-ID

Gain Bit

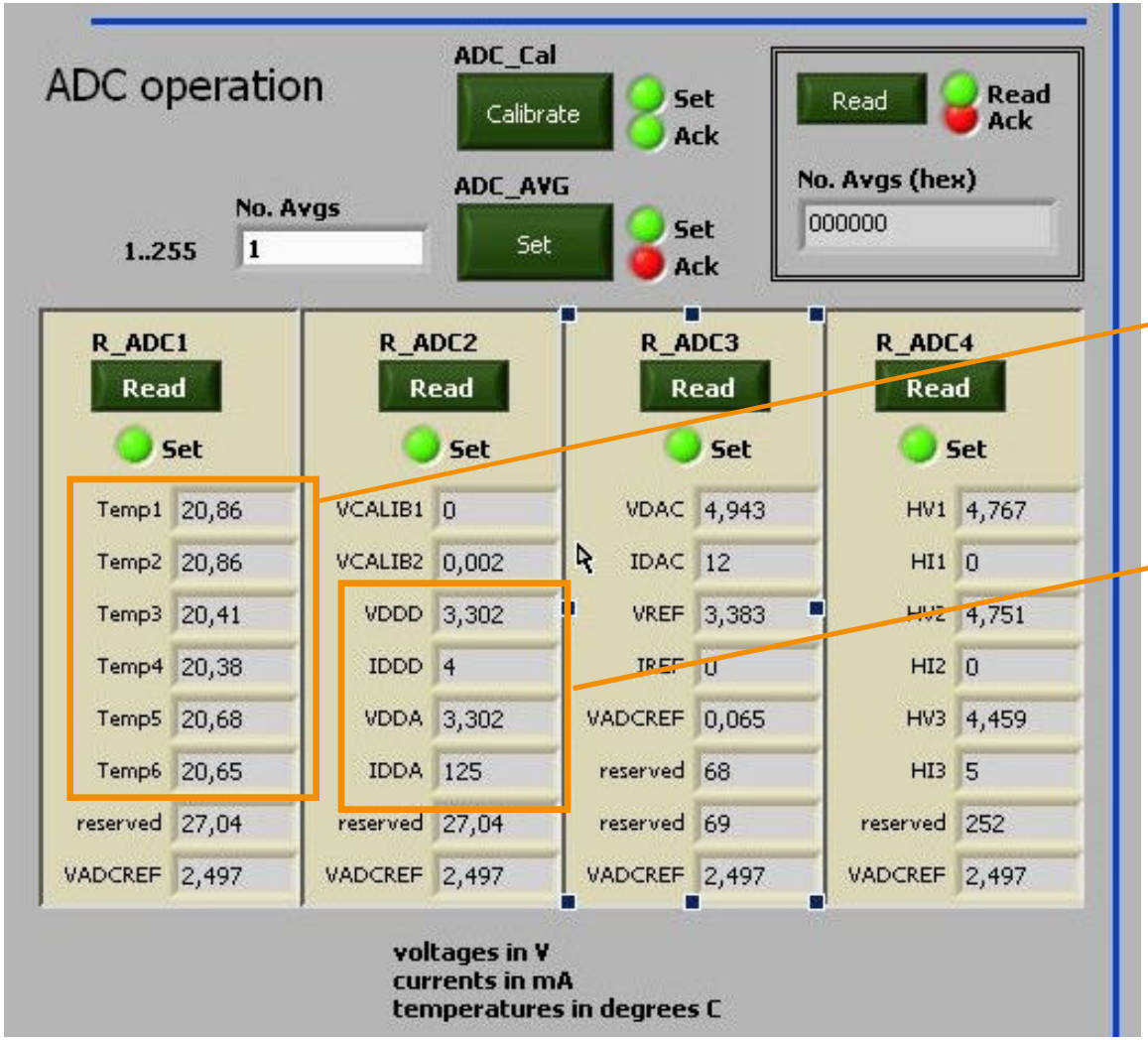
Hit Bit

Enabled Chns. with Signals



Commissioning (status Tuesday)

Slow Control : Read detector's temperatures, voltages, currents



HBU temperature profile

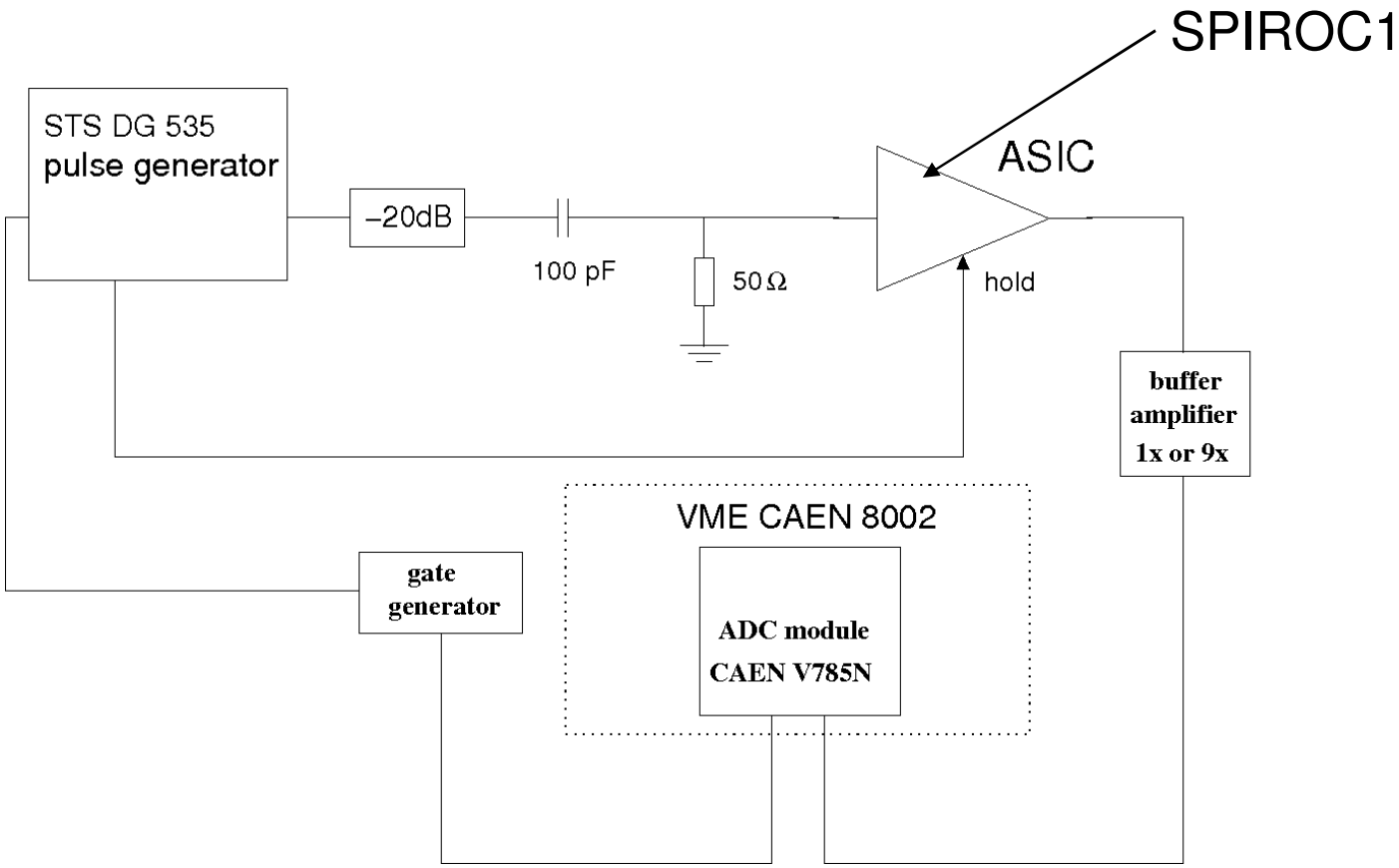
VDDA, VDDD and currents

Slow-Control: Still under test

SPIROC1 Analogue Tests

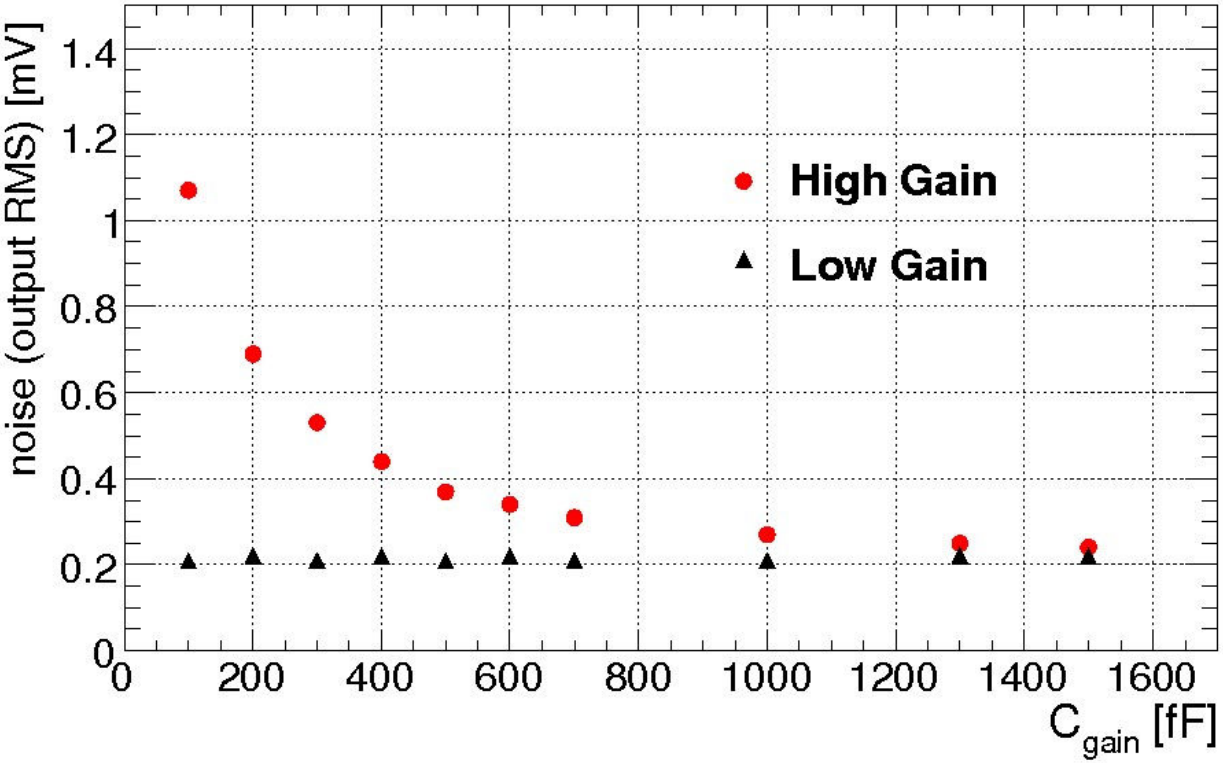
Tests performed by
Wei Chen, Benjamin Lutz, Riccardo Fabbri

Test Setup:



SPIROC1 Analogue Tests

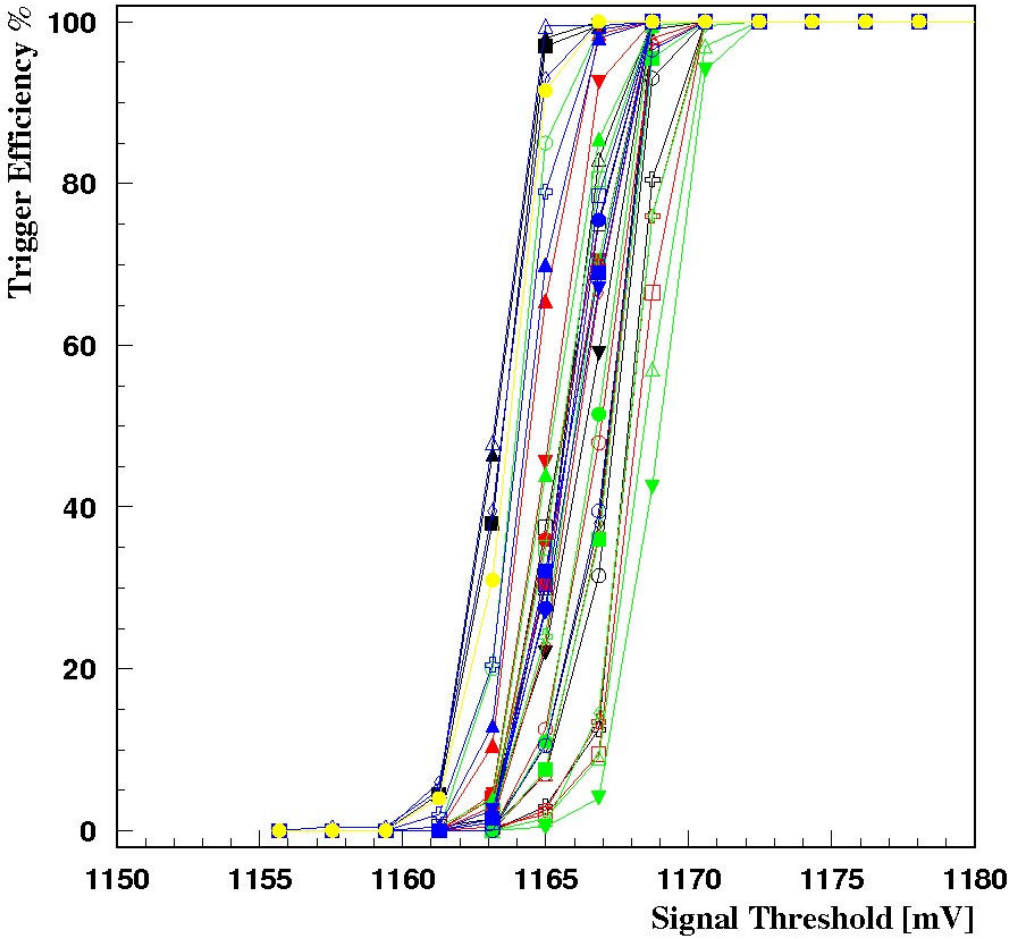
Noise vs. preamplifier feedback capacitance C_{gain}



50ns shaping

SPIROC1 Analogue Tests

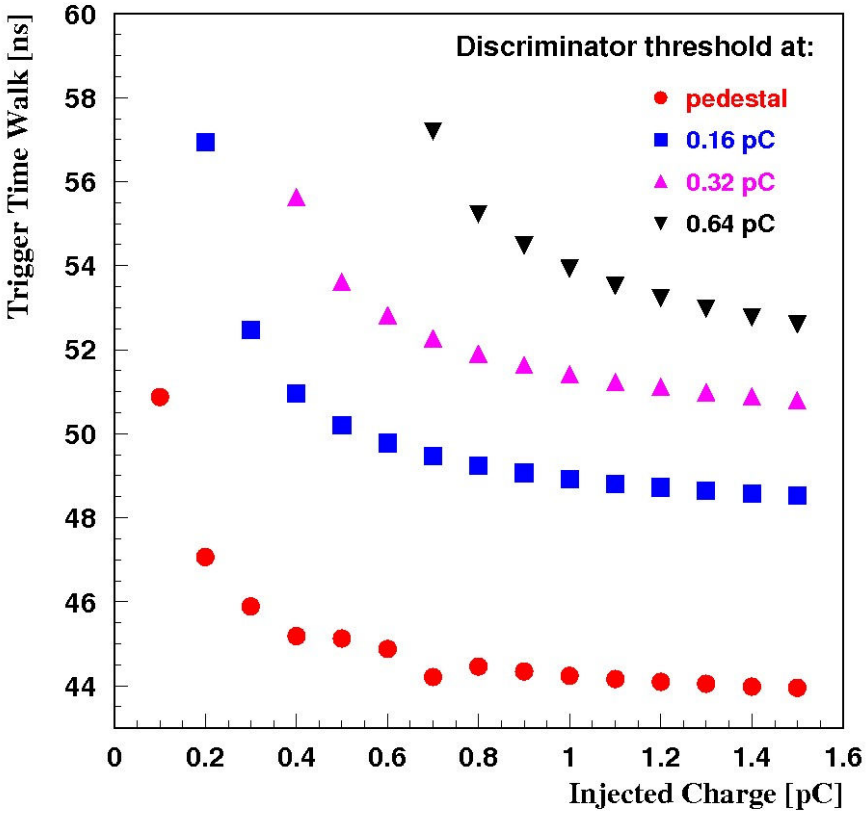
S-curves (trigger efficiency) for pedestal using external trigger



8mV chn-to-chn spread

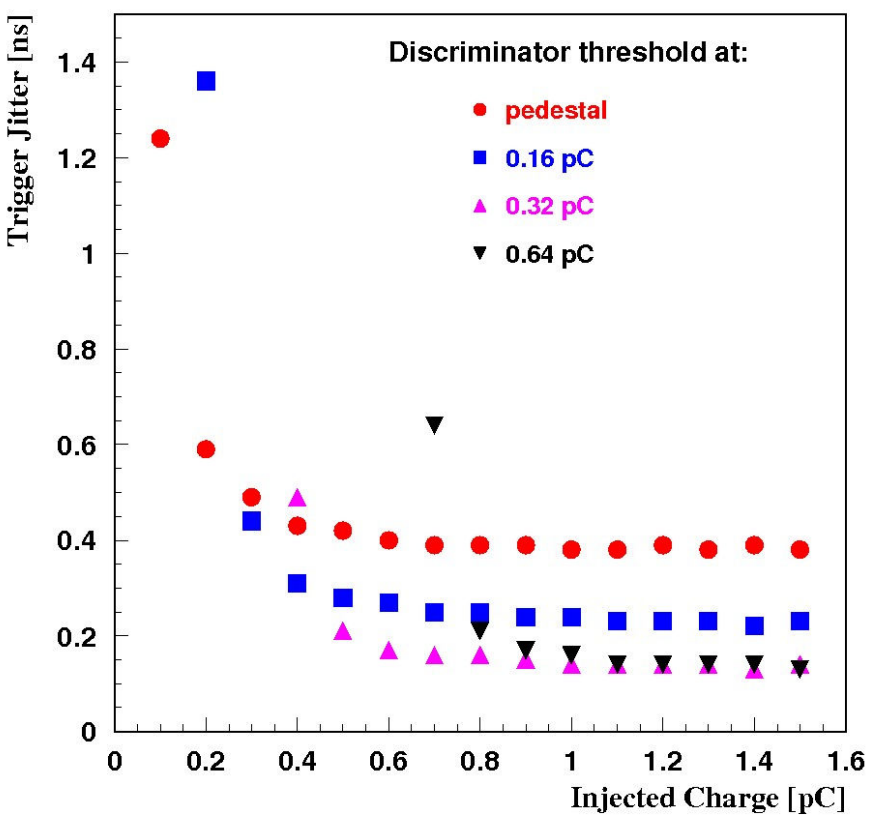
SPIROC1 Analogue Tests

Trigger time walk



Large time-walk at small charges
=> Problematic in calibration mode

Trigger jitter

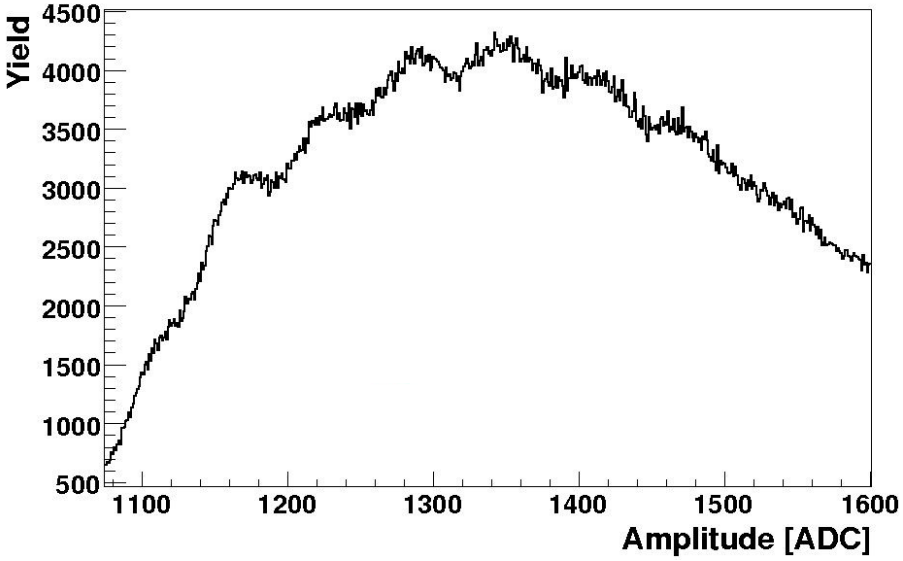


Results consistent with Orsay

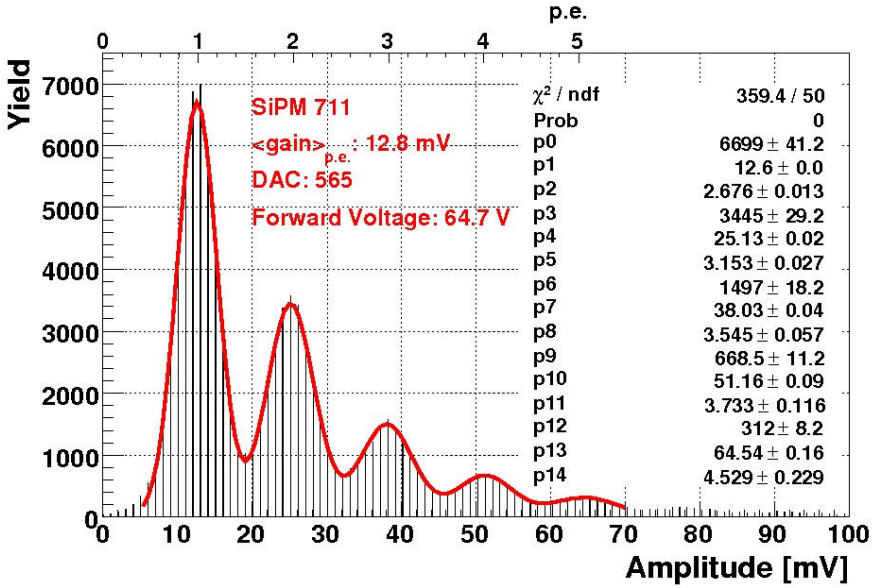
SPIROC1 Analogue Tests

Single Pixel Spectra for calibration using internal (auto-) trigger

SPIROC1a testboard



SPIROC1b testboard



New measurements from Monday

Calibration possible,
even with internal trigger!!

Conclusions and Outlook

- AHCAL prototype delivers first test-data from LED system.
  => Full data acquisition chain is running (via USB link).
- British DAQ (hardware, DIF firmware) still has to be implemented.
- AHCAL prototype is prepared for DESY testbeam (USB based?).
- Labview GUI has to be extended for testbeam (=> Sandra Christen).
- Redesign concepts of AHCAL modules are prepared now.
- SPIROC analogue and digital tests ongoing.