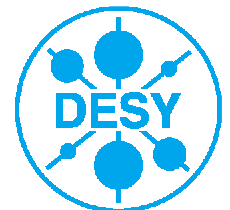


AHCAL Electronics.

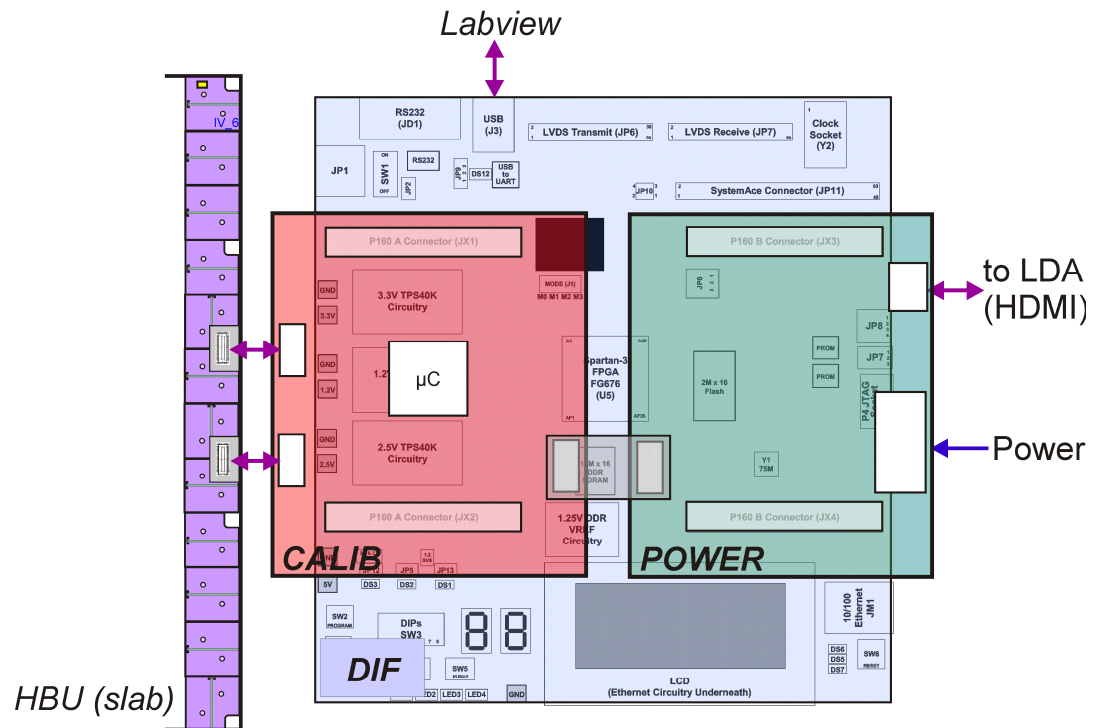
Status and Outlook

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

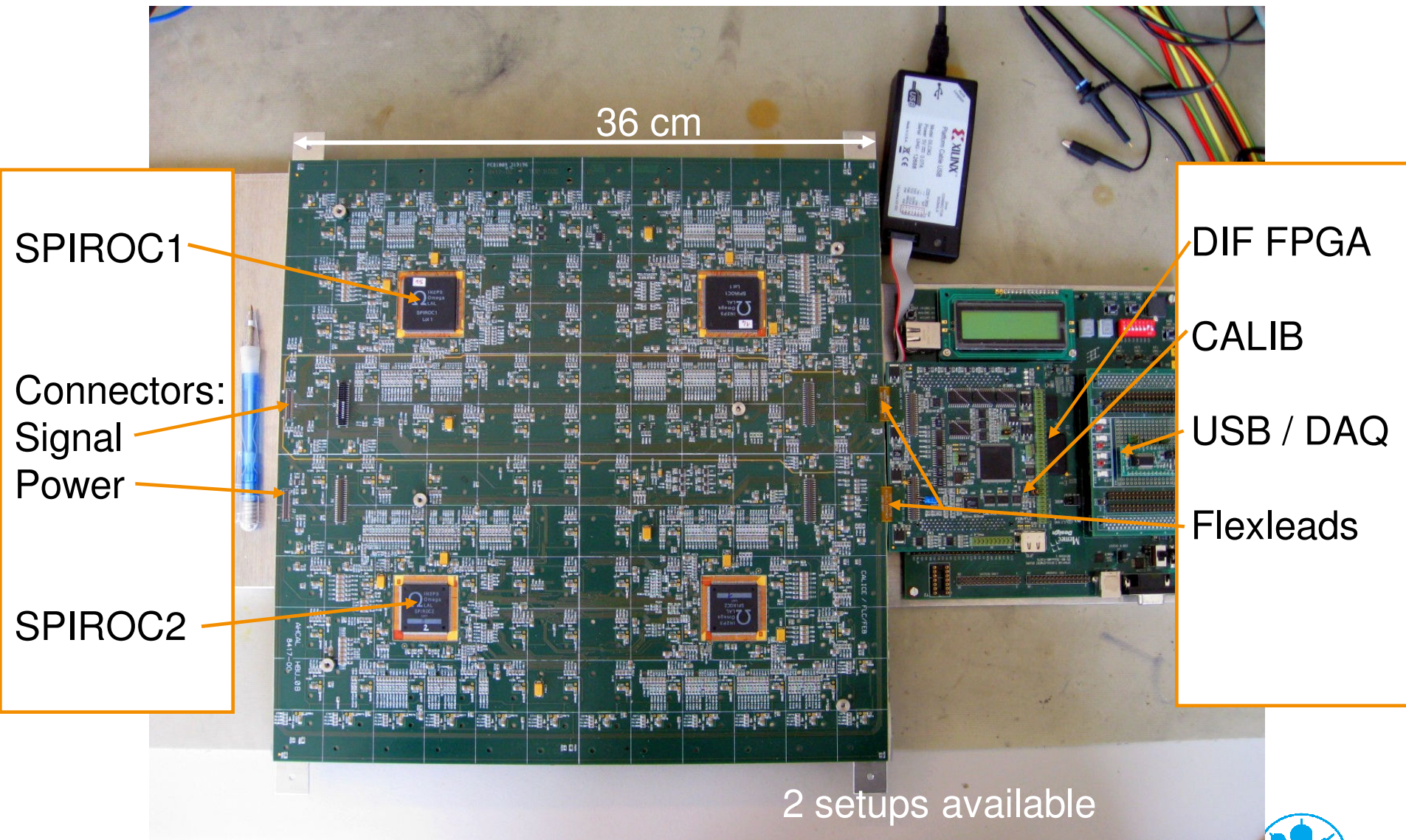


Outline

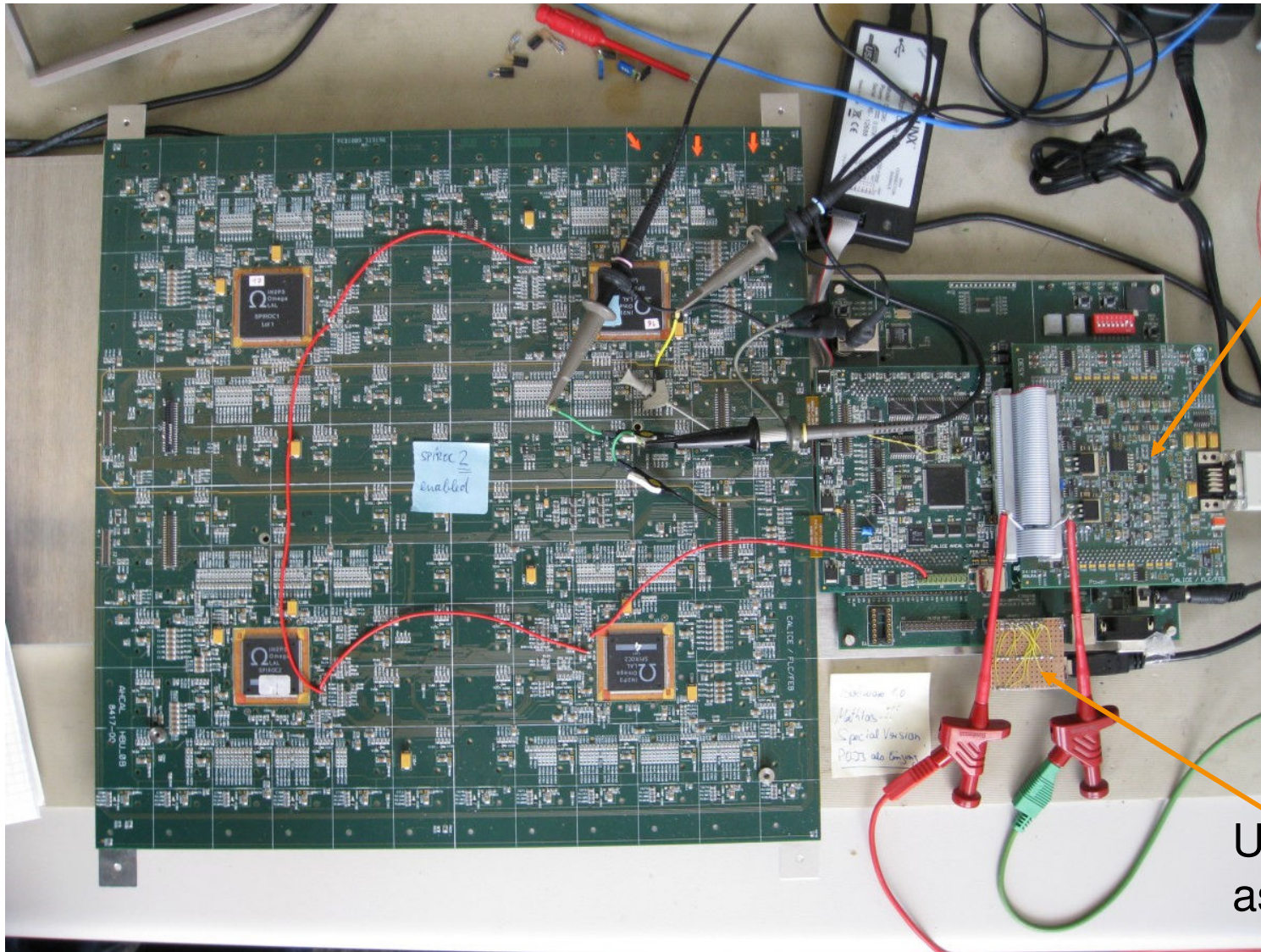
- Introduction
- DIF and Electronics Status
- SPIROC Analogue Tests



HCAL Base Unit (HBU) setup



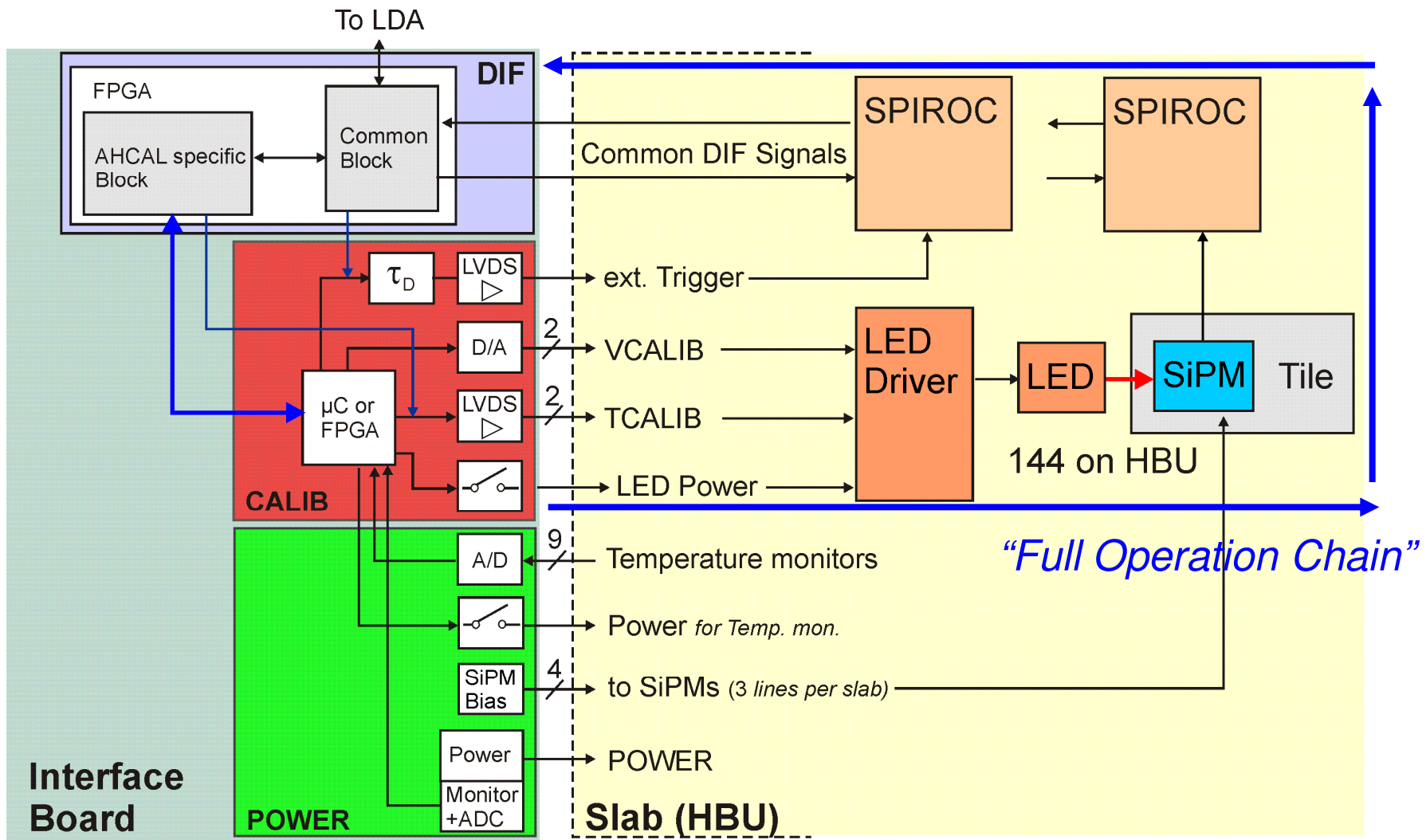
HCAL Base Unit (HBU) setup - reloaded



POWER
Module
integrated

USB stepped
aside

Commissioning – Signal Chain for LED operation



Concept : December 2007



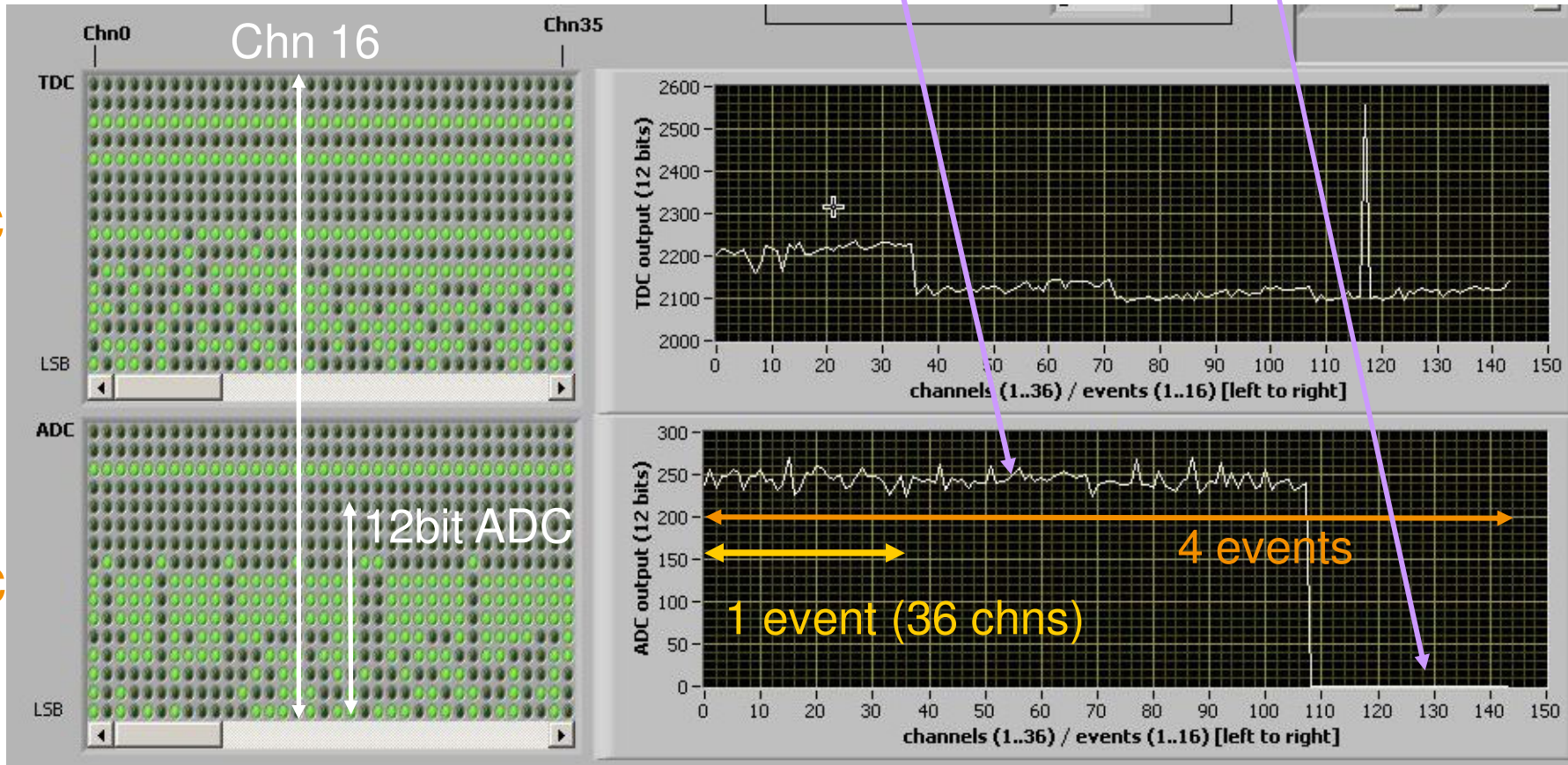
Commissioning

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

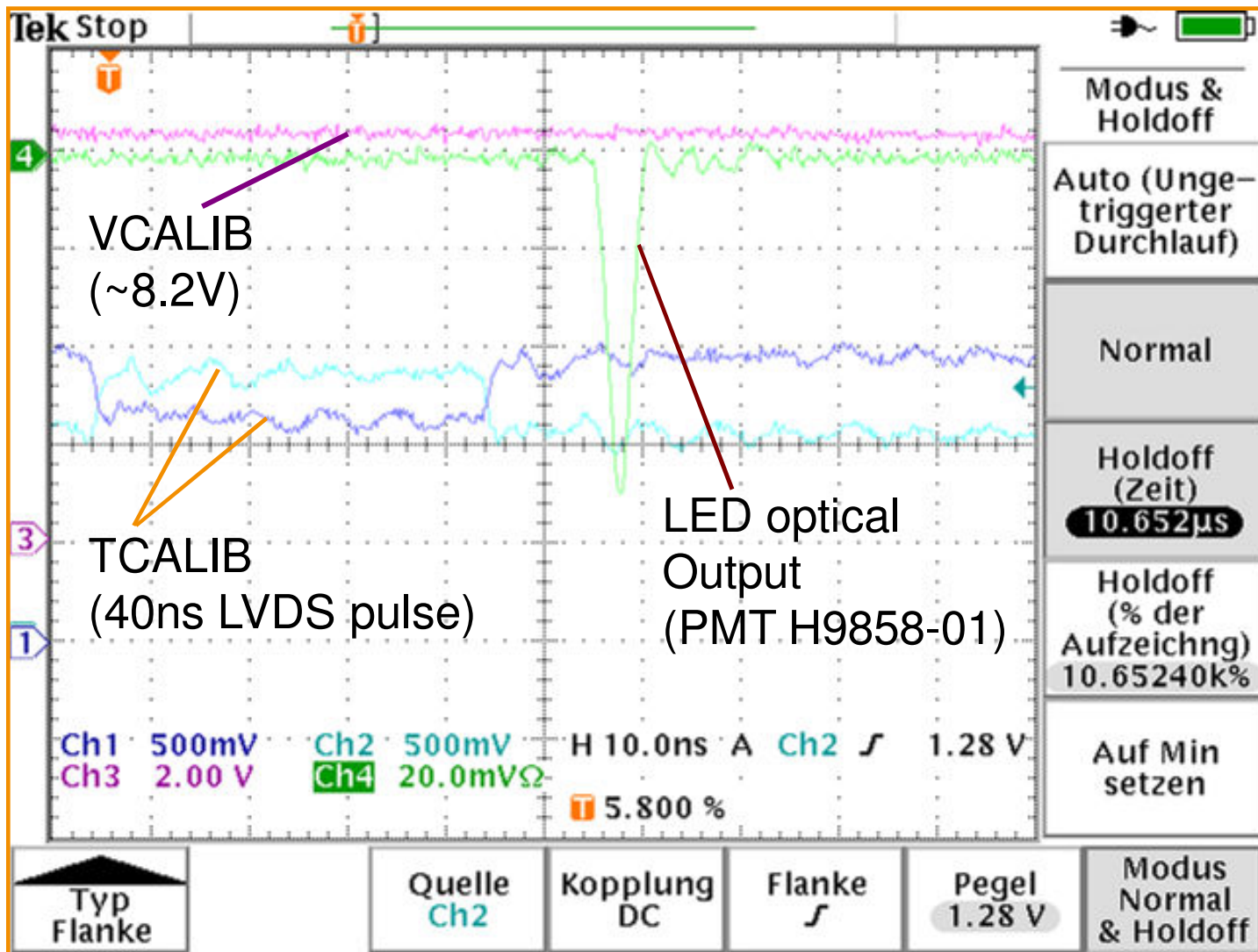
1st event always '0'

TDC

ADC



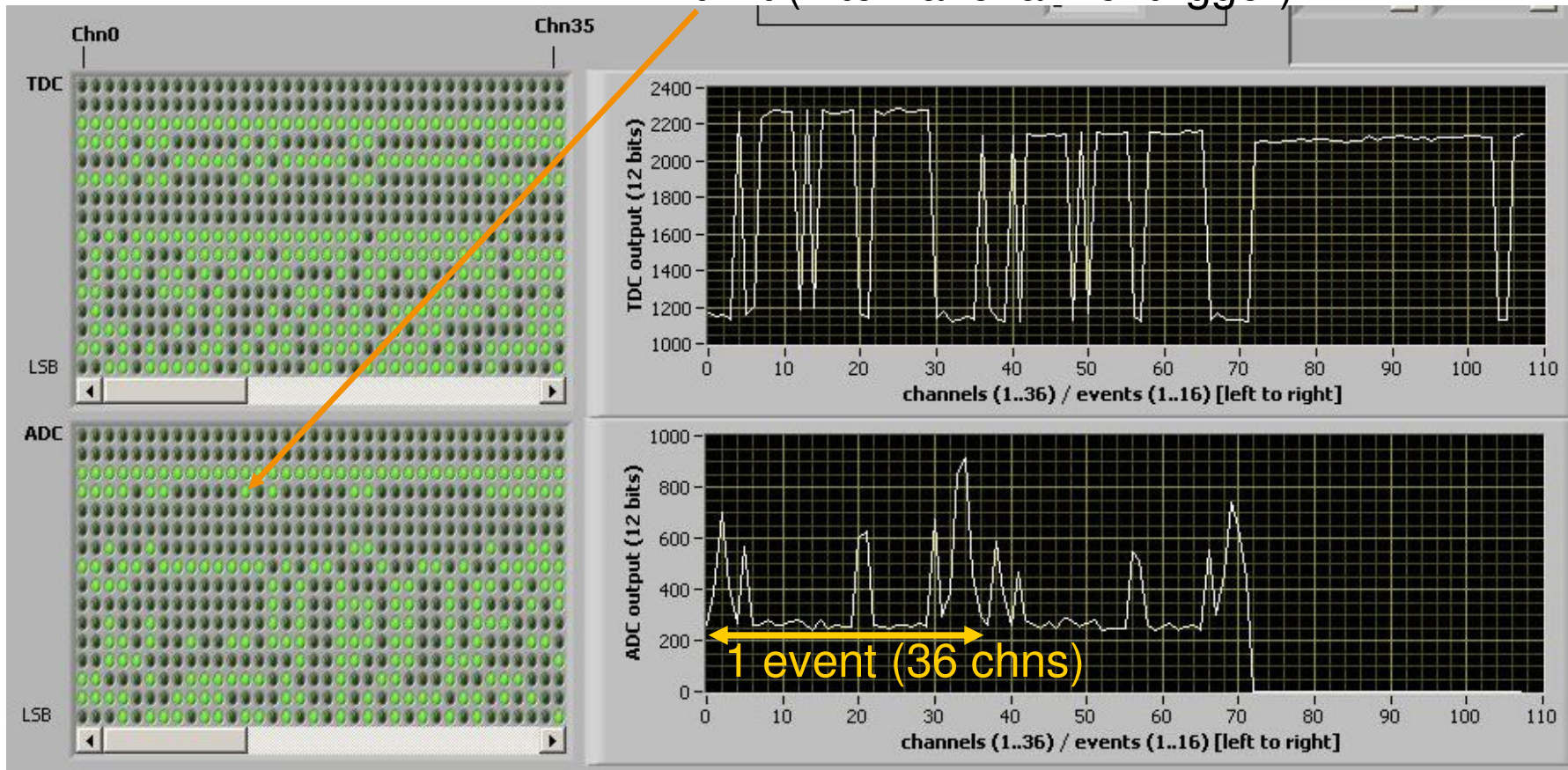
LED Pulse shape (measured on HBU)



Commissioning (status last Friday)

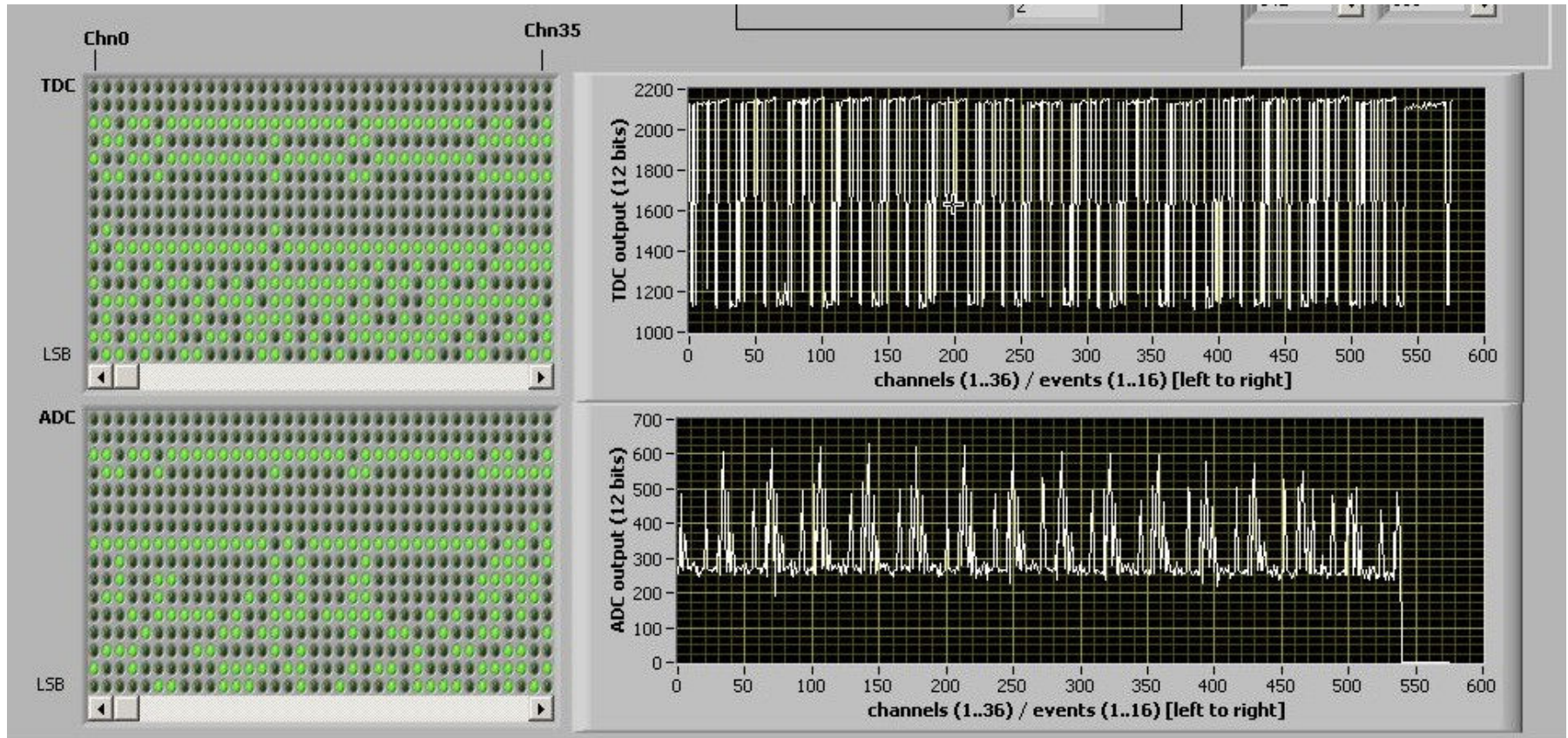
SPIROC2 output: LEDs firing, 3 events (triggers), 18 tiles assembled

Hit Bit (internal channel trigger)



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

ADC operation

ADC_Cal
Calibrate Set Ack

ADC_AVG
Set Set Ack

No. Avgs
1..255

Read Read Ack

No. Avgs (hex)

R_ADC1	R_ADC2	R_ADC3	R_ADC4
<input type="button" value="Read"/> <input checked="" type="radio"/> Set	<input type="button" value="Read"/> <input checked="" type="radio"/> Set	<input type="button" value="Read"/> <input checked="" type="radio"/> Set	<input type="button" value="Read"/> <input checked="" type="radio"/> Set
Temp1 20,86	VCALIB1 0	VDAC 4,943	HV1 4,767
Temp2 20,86	VCALIB2 0,002	IDAC 12	HI1 0
Temp3 20,41	VDDD 3,302	VREF 3,383	HV2 4,751
Temp4 20,38	IDDD 4	IREF 0	HI2 0
Temp5 20,68	VDDA 3,302	VADCREf 0,065	HV3 4,459
Temp6 20,65	IDDA 125	reserved 68	HI3 5
reserved 27,04	reserved 27,04	reserved 69	reserved 252
VADCREf 2,497	VADCREf 2,497	VADCREf 2,497	VADCREf 2,497

voltages in V
currents in mA
temperatures in degrees C

HBU temperature profile

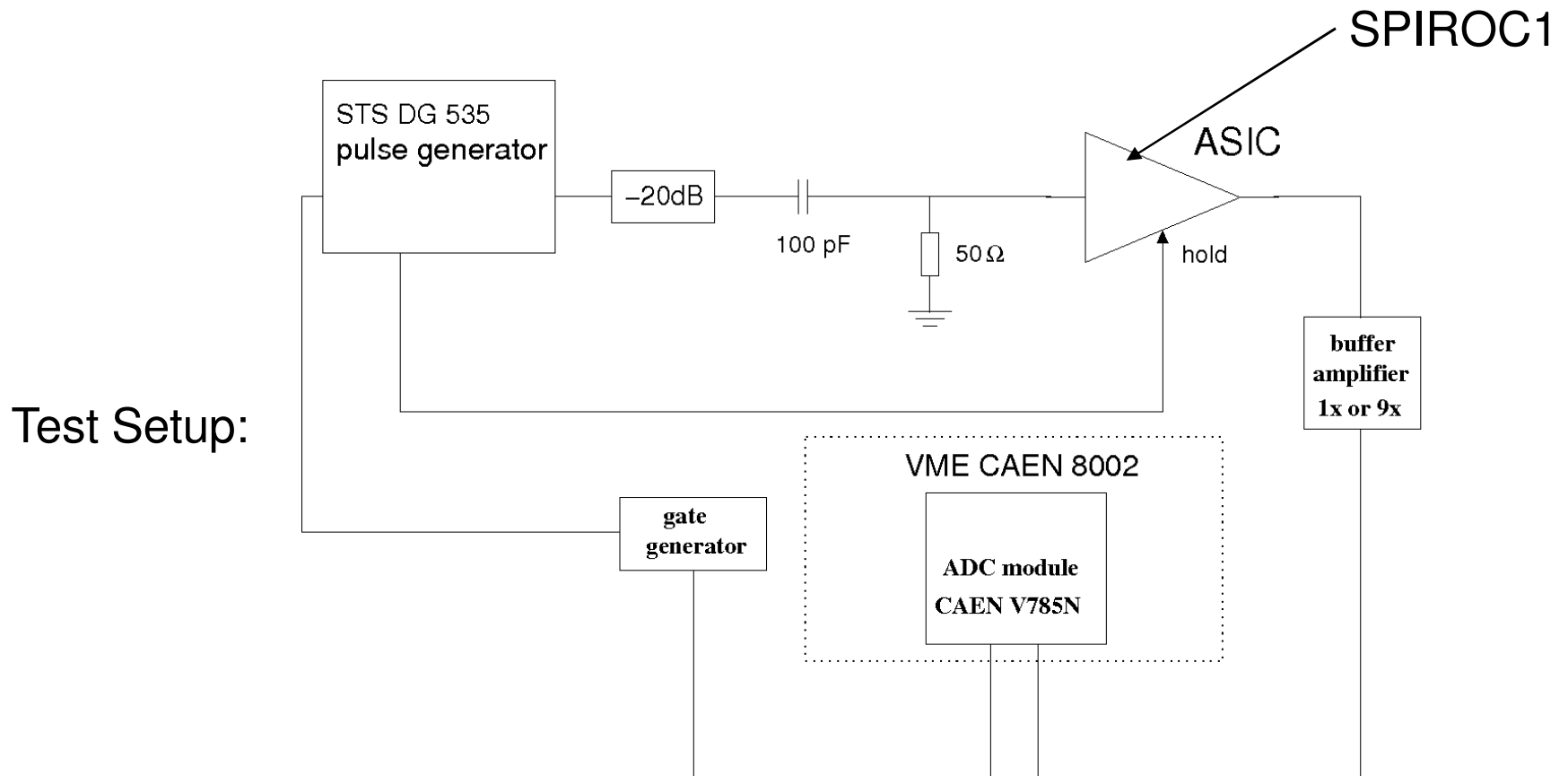
VDDA, VDDD and currents

**Slow-Control:
Still under test**



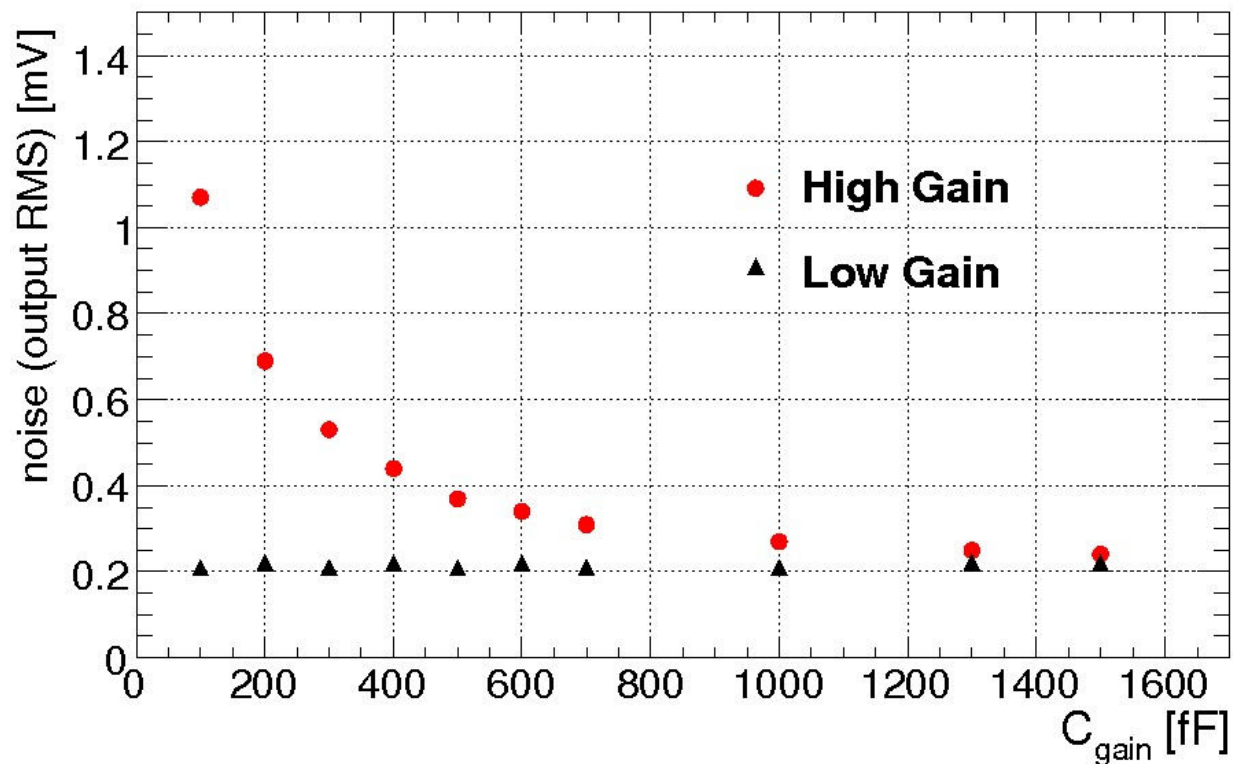
SPIROC1 Analogue Tests

Tests performed by
Wei Chen, Benjamin Lutz, Riccardo Fabbri



SPIROC1 Analogue Tests

Noise vs. preamplifier feedback capacitance C_{gain}

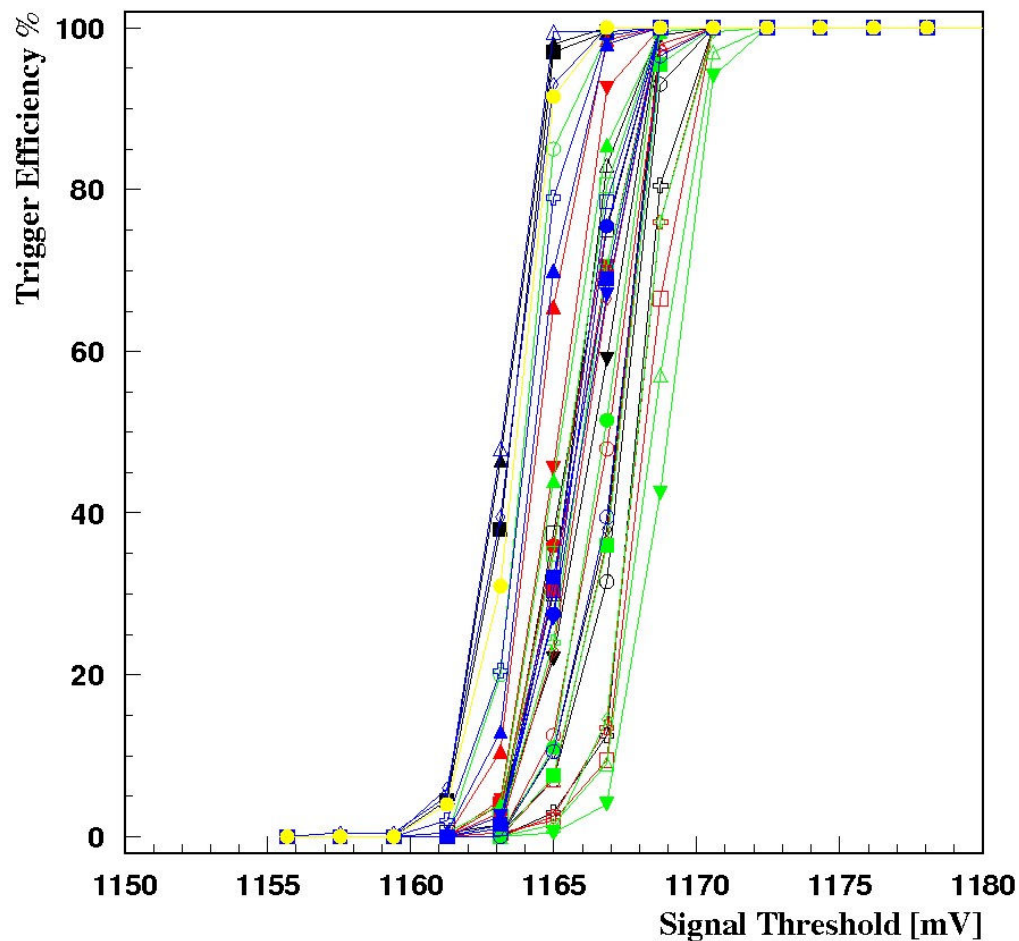


50ns shaping



SPIROC1 Analogue Tests

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

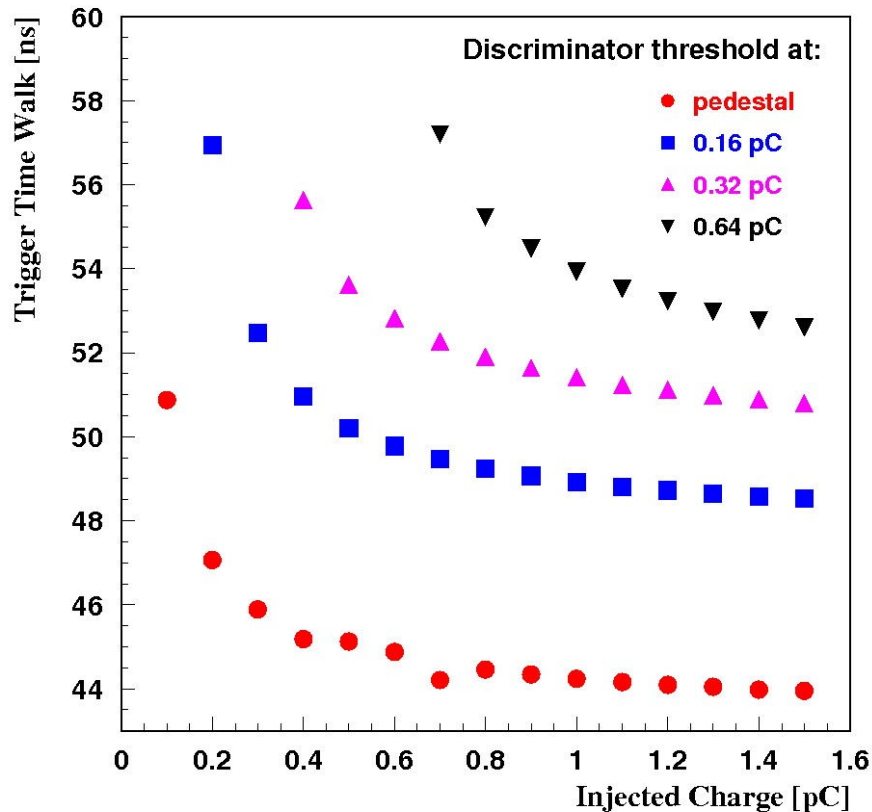


8mV chn-to-chn spread



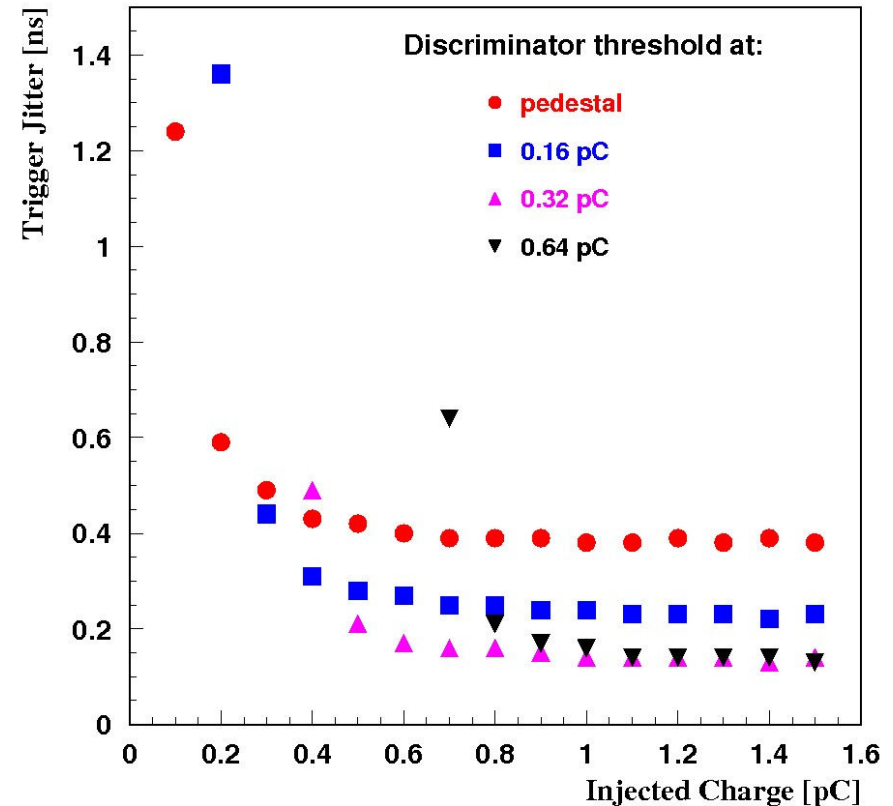
SPIROC1 Analogue Tests

Trigger time walk



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

Trigger jitter



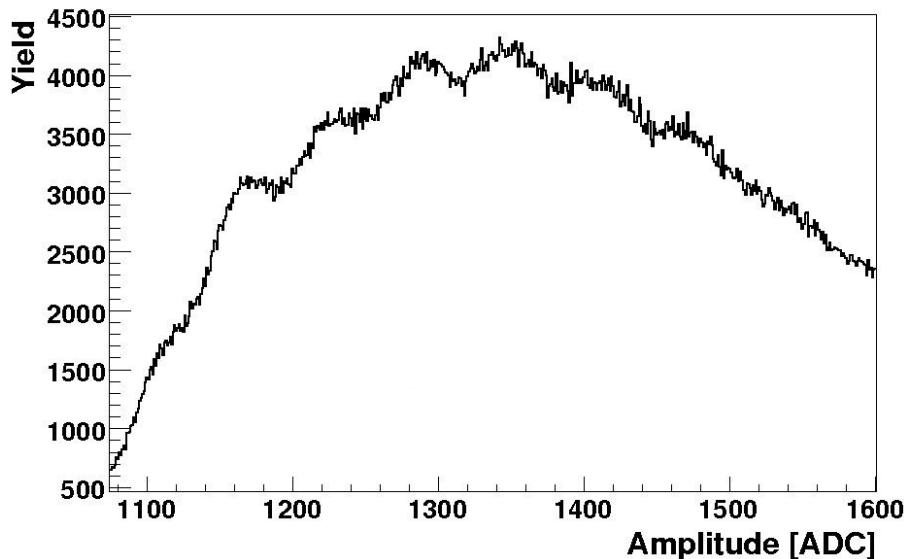
Results consistent with Orsay



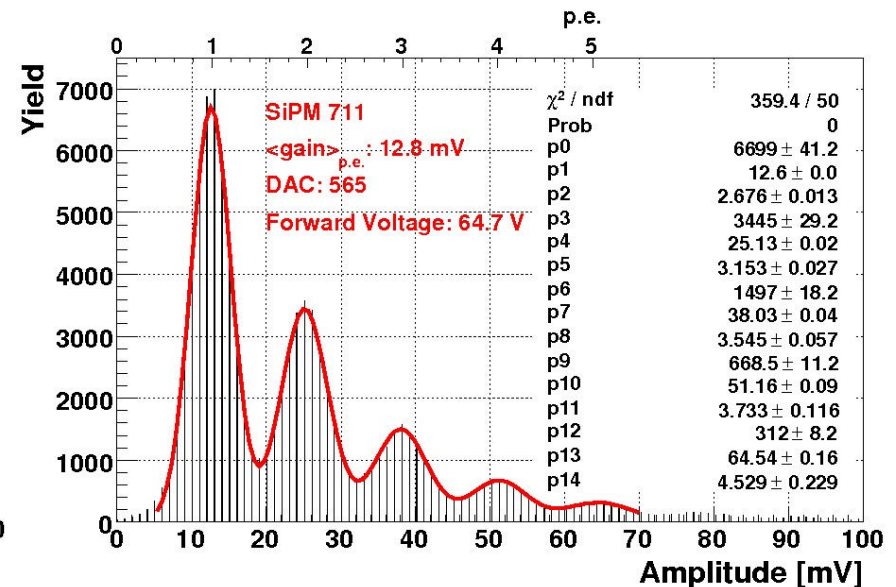
SPIROC1 Analogue Tests

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.

