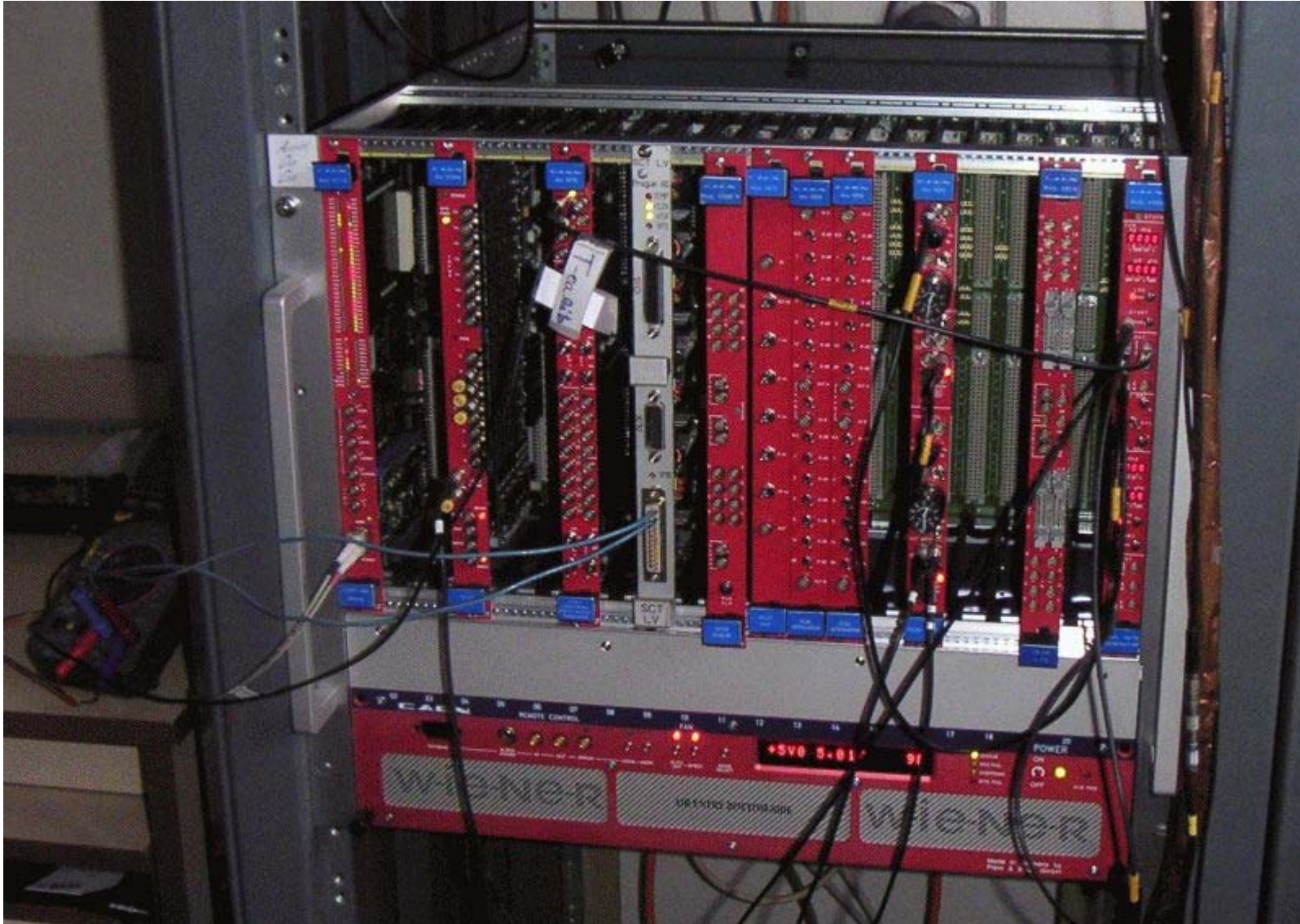# New calibration system - first ideas

Ivo Polák,   Institute of Physics ASCR Prague

Activity in Prague

- CMB with VME

- PIN photodiode crosstalk test

- Ideas, more questions to a new calibrator

VME and SCTLV module (deleloped for SCT ATLAS) used as V-calib DAC

PC +oscilloscope, LabView to control Vcalib (SCTLV)
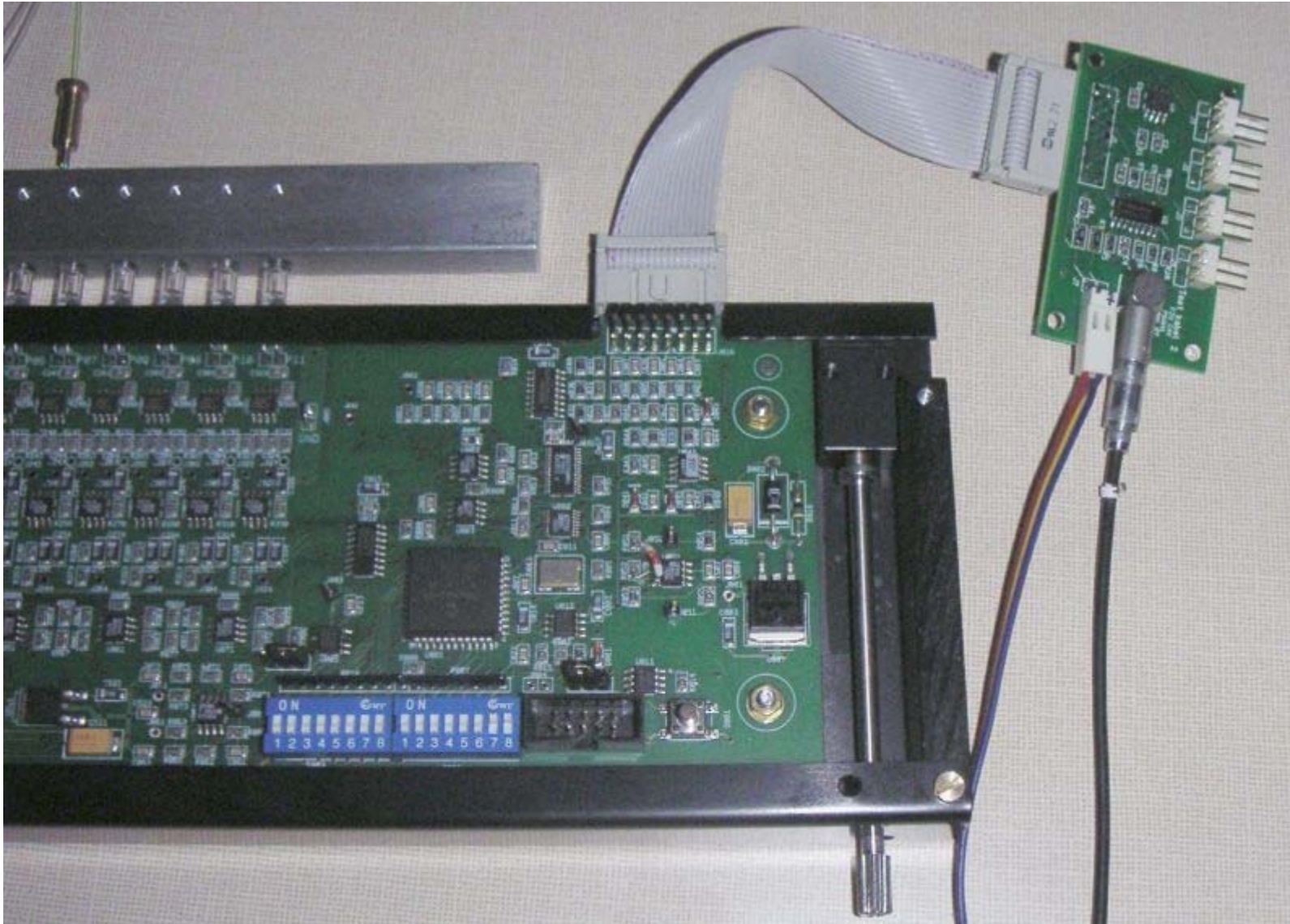## there we refreshed that HEX   F+F ≠ 2F but = 1E =▶ 30$_{dec}$

CMBs **N**aked and **E**ncapsulated
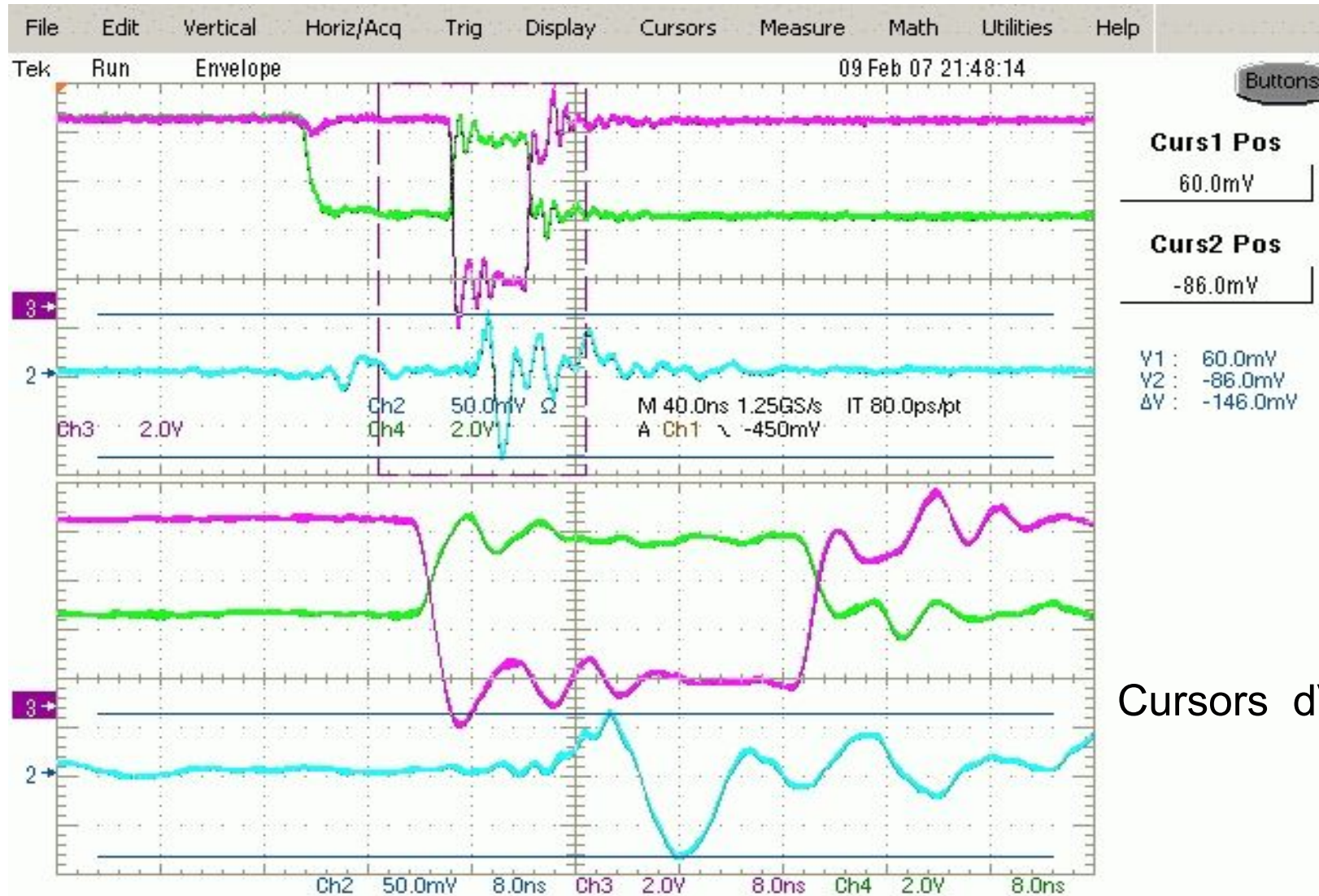
T-calib convertor TTL -> LVDS

PIN-PD Signal (cyan) Encapsulated CMB

xtalk LEDdrv to PIN   V-calib = 0
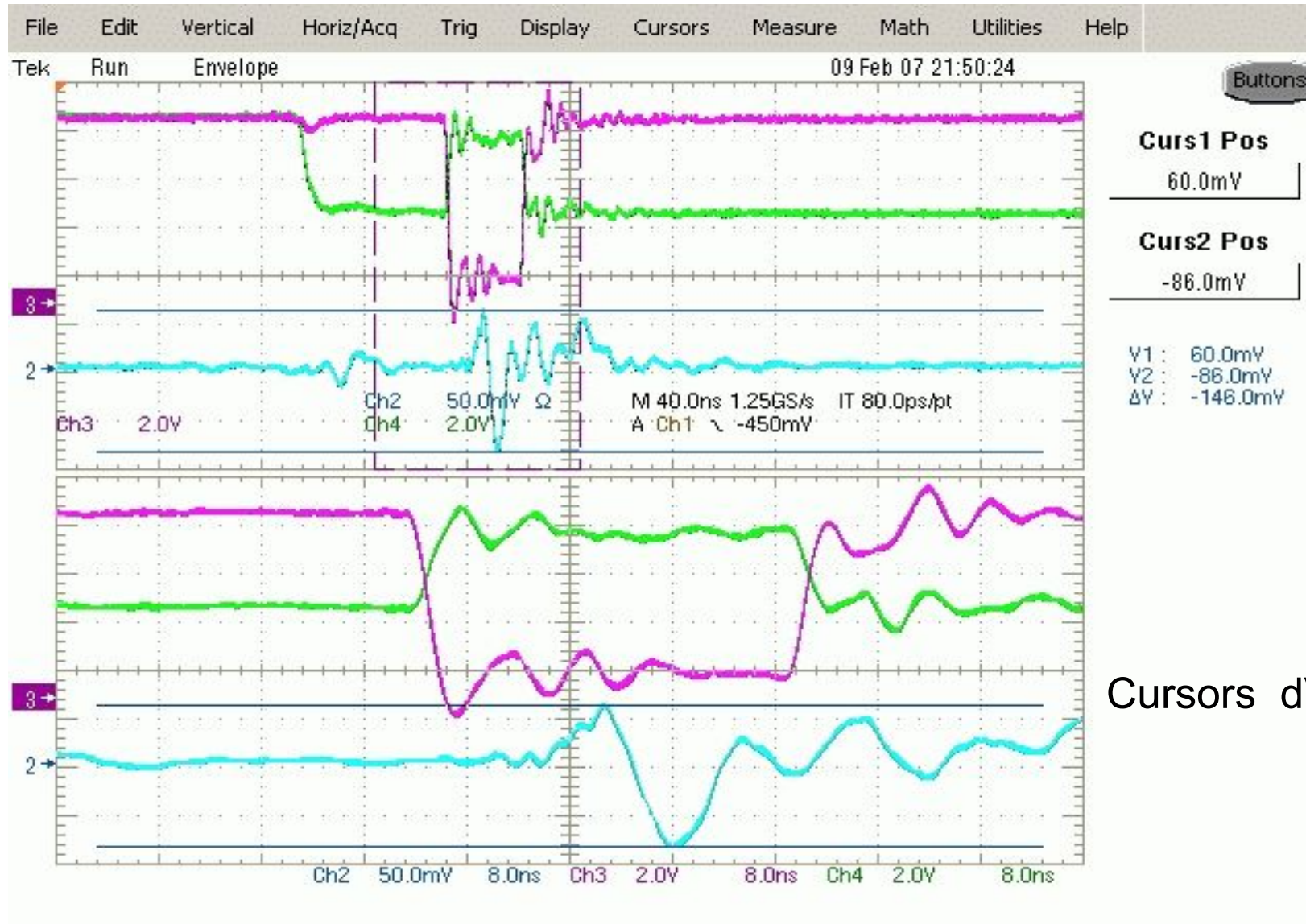

Cursors dV = 146mV

PIN-PD Signal (cyan) Encapsulated CMB

xtalk LEDdrv to PIN   V-calib = **MAX**
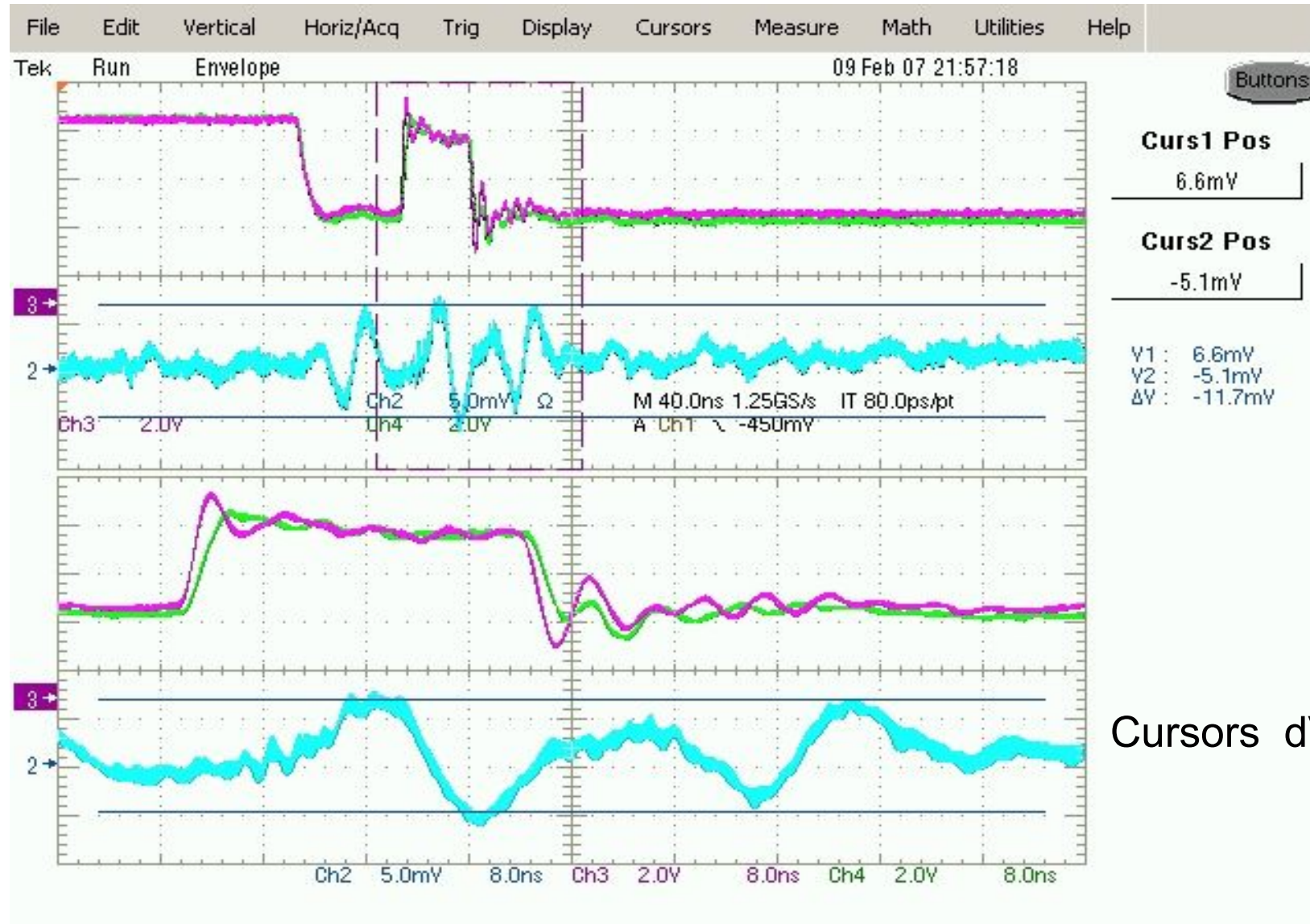

Cursors dV = 146mV

PIN-PD Signal (cyan) Naked CMB

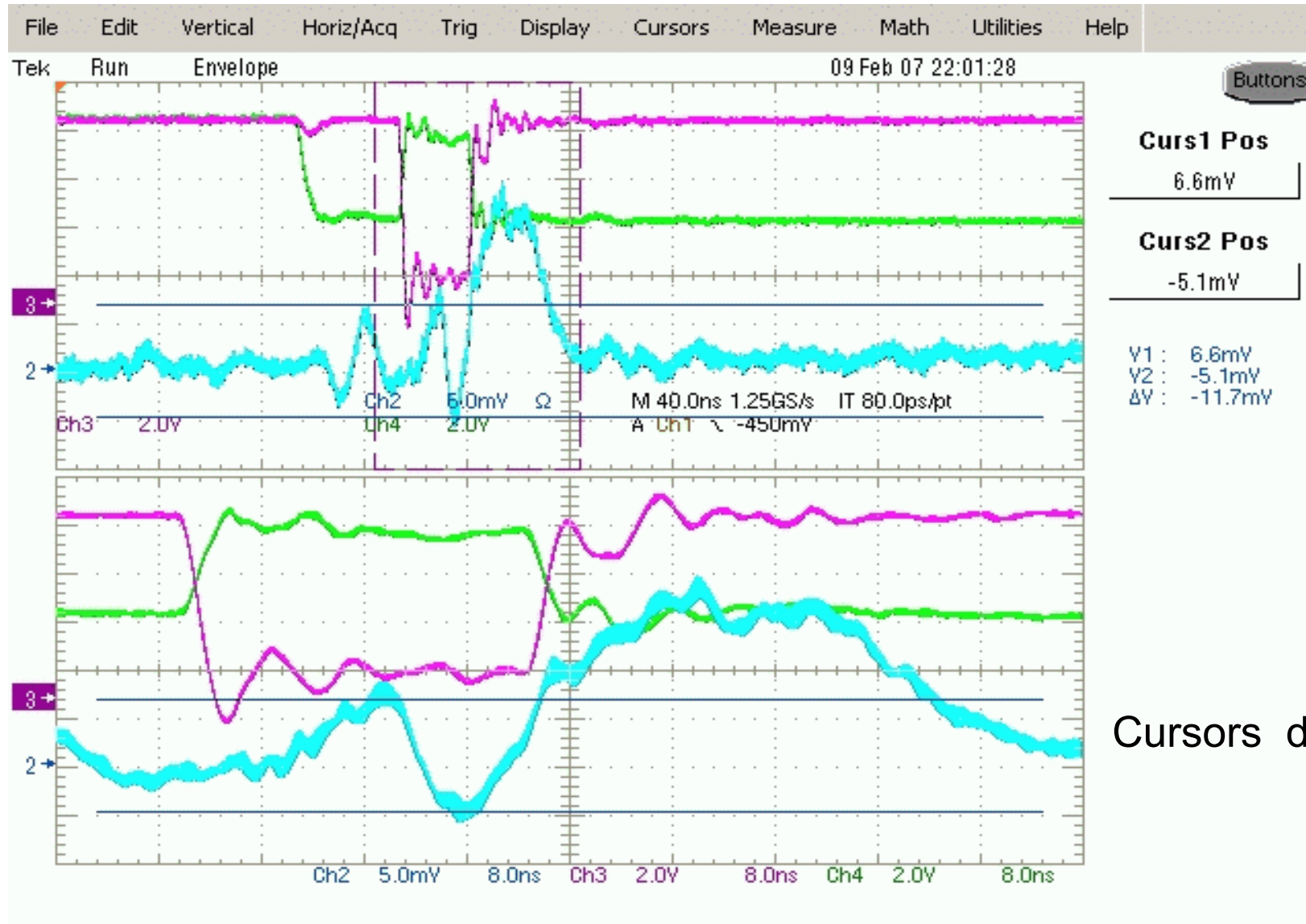**xtalk LEDdrv to PIN**   V-calib = 0

Cursors dV = 12mV

PIN-PD Signal (cyan) Naked CMB

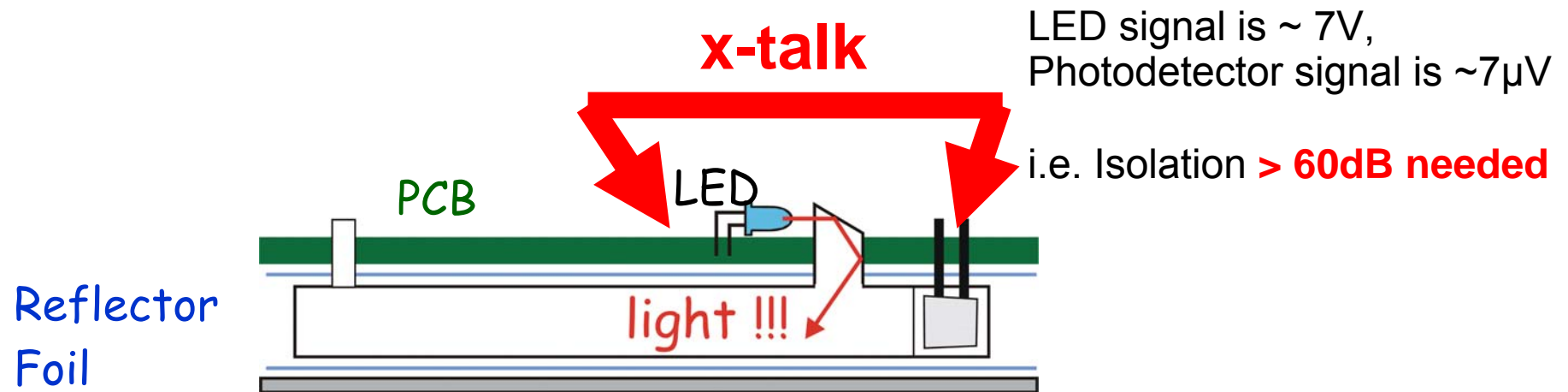**xtalk LEDdrv to PIN**   V-calib = **MAX**

Cursors dV = 12mV

Questions to be answered in coming months

LED	YES/NO	What is primary task for	Linearity scan Single p.e. Peak Stability monitoring Parameters	Fixed puls width, 8ns? Amplitude control Enabling
PIN photodiode	YES/NO	separation to LED driver		
TEMP sensing	YES/NO	Density /m^2, or # per layer		
CANbus controlling	YES/NO	Slow control		
T-calib	YES	LVDS		
V-calib	YES/NO	Amplitude via slow control **only**		

Recent problem found...

x-talk

LED signal is ~ 7V,
Photodetector signal is ~7µV

i.e. Isolation **> 60dB needed**

PCB

LED

Reflector
Foil

light !!!

One LED per tile   : No fibers needed.
One LED per HBU : No fibers between modules (HBUs)

CMB power dissipation

- Current version drain 0.65A @ 12V per plane.

- Most of this power is used by PIN-diode wideband preamp and output line-driver (12 x 30mA = 360mA).

- LED driver already uses power cycling.

- Fast signals needs power!

- The CMB has not been optimised for the power consumption.

conclusion

- Calibration LED technique should be defined.

- To combine SiPM and LED driver is difficult.

- Power consumption of CMB could be cutted down.

- We have to collaborate with mechanical design.