First results from fTOF prototype test at SLAC CRT

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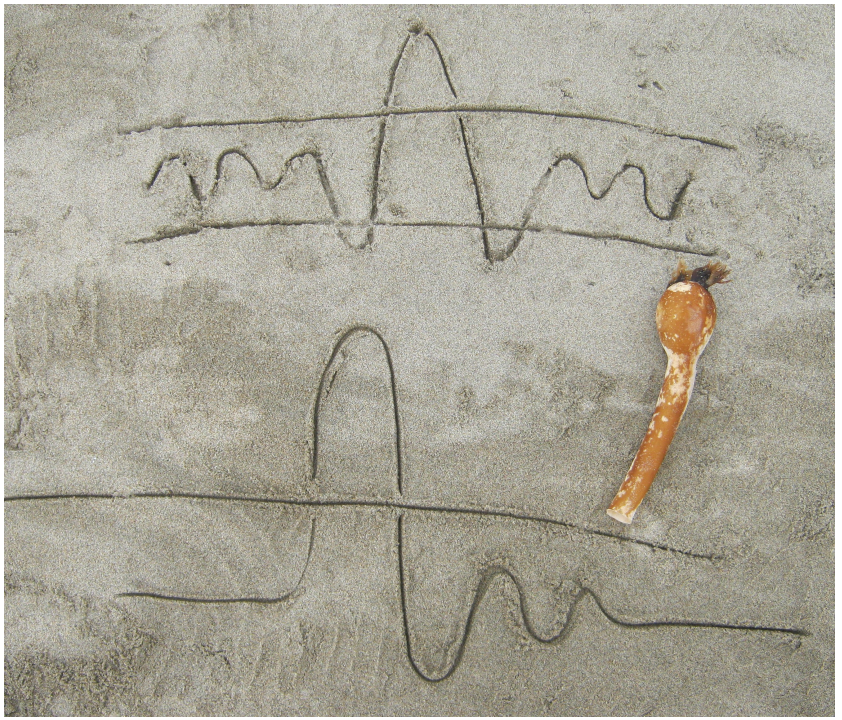
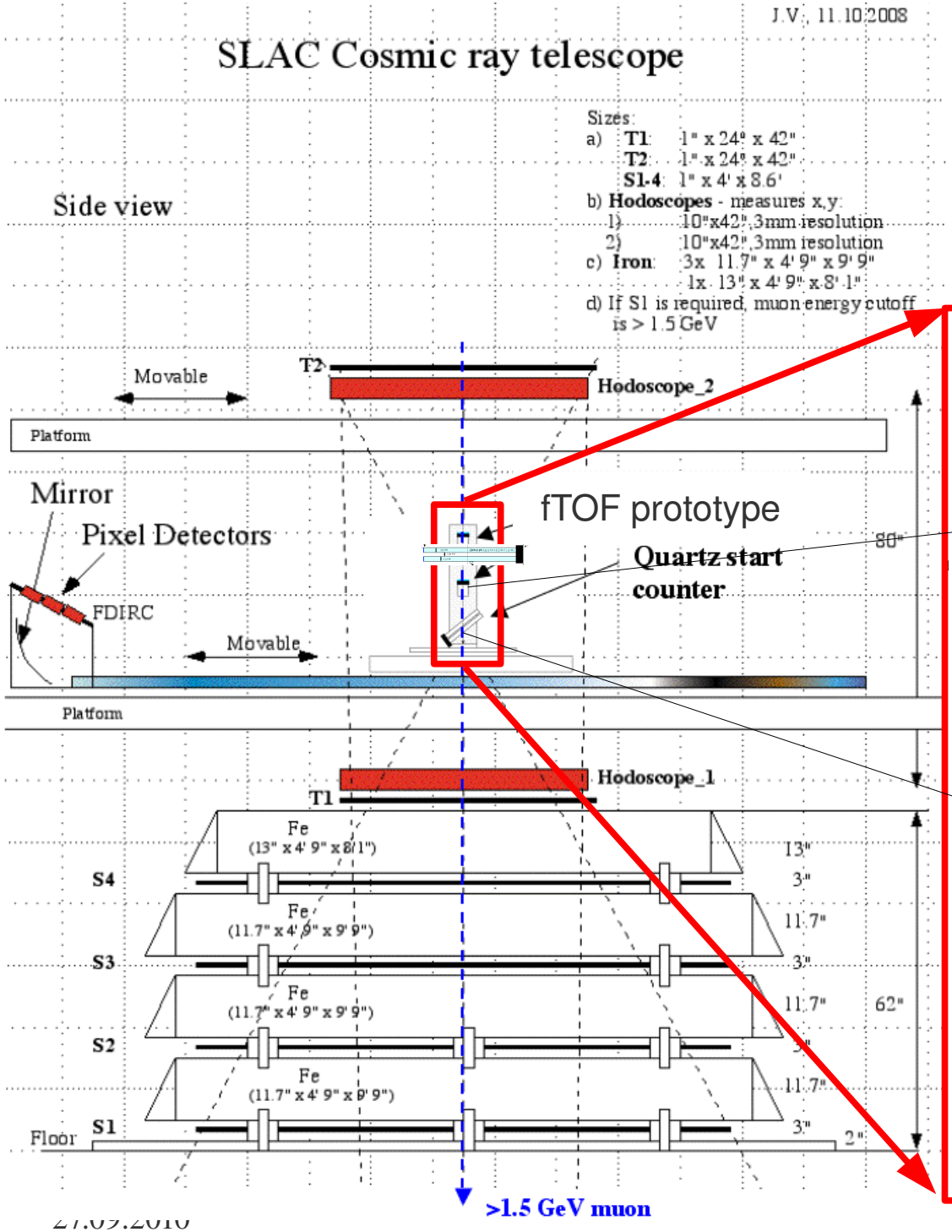


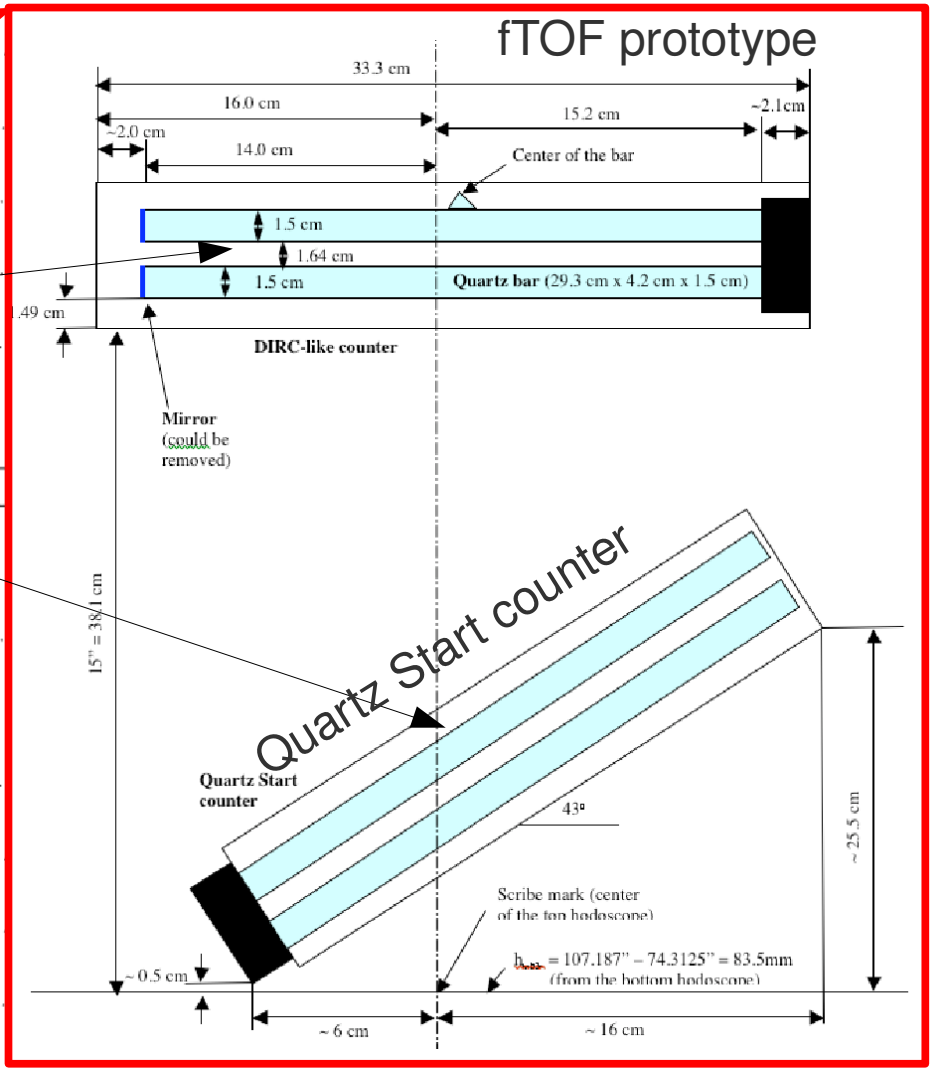
Outline

- Experimental Setup
- DAQ
- Time synchronization monitoring

- Run with laser
- Calibration of the system without laser
- Run with cosmic muon
  results **without data from CRT**

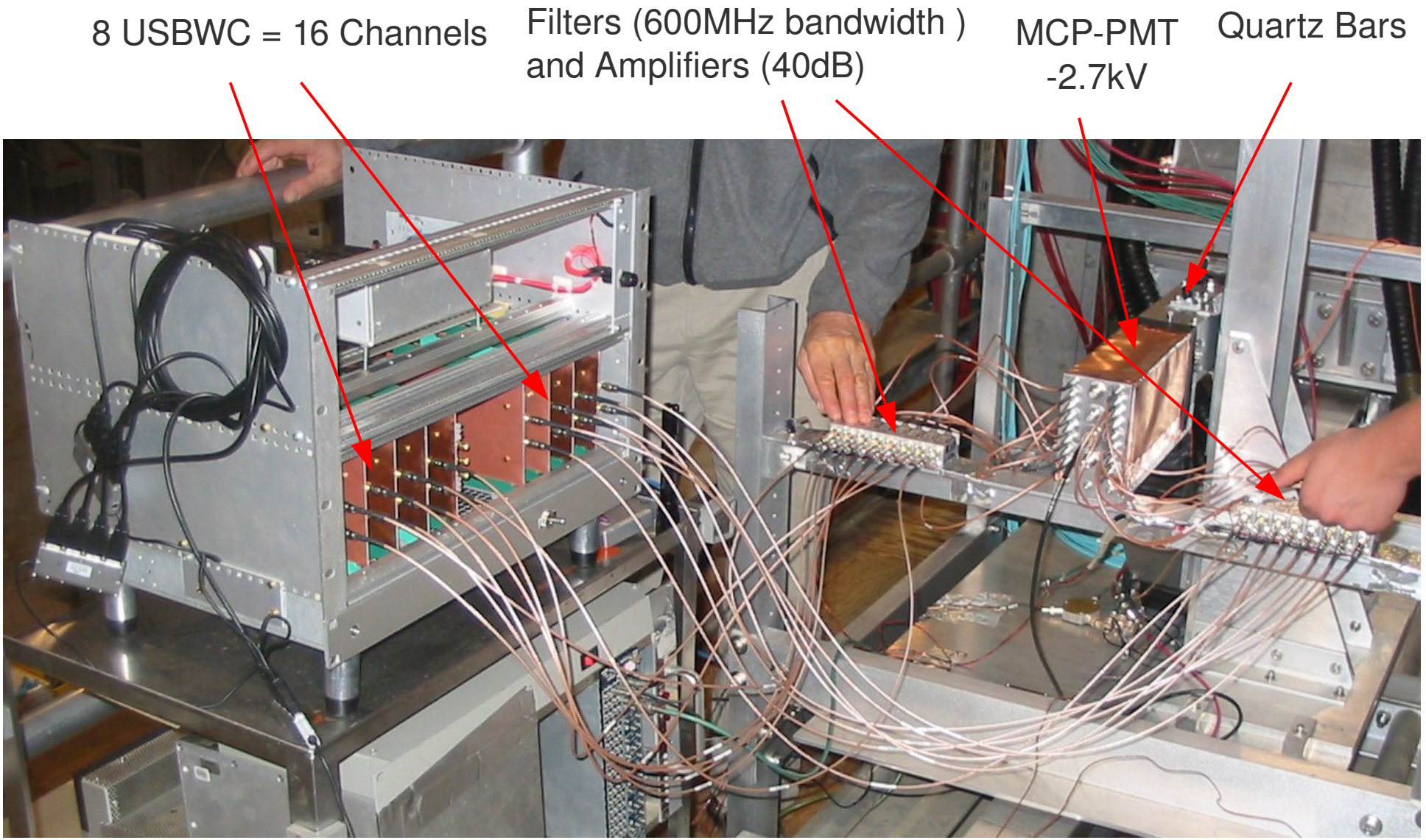
Experimental Setup(1)





http://www.slac.stanford.edu/pubs/slacpubs/13750/SLAC-PUB-13873.pdf

Experimental Setup(1)



DAQ

CRT and Multi Wave Catchers DAQ are running independently. It is possible to merge them in time. For this we need precise time mark.

ntp Server

(Network Time Protocol)

CRT DAQ

T1xT2xQSCxS4

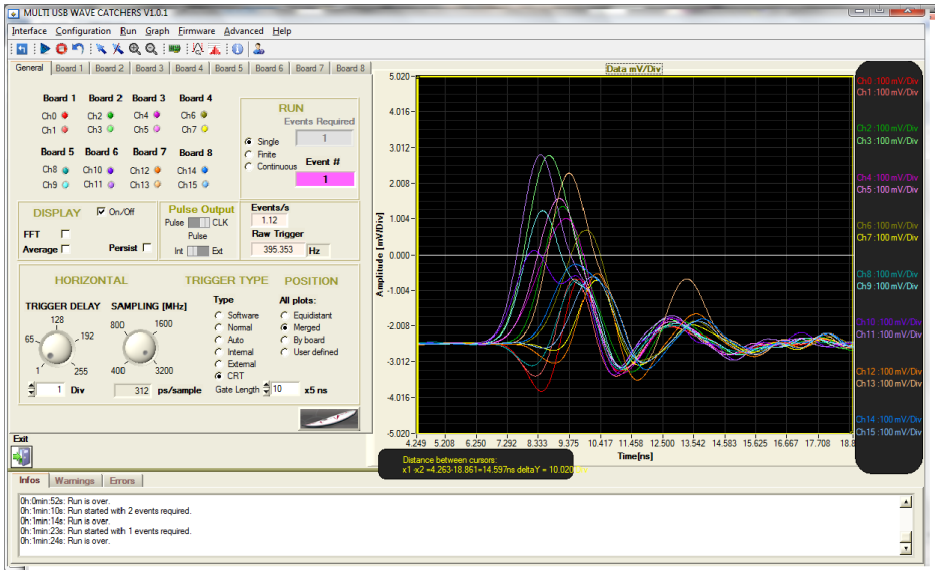
Data rate in CRT 0.15 event/s

Multi Wave Catchers DAQ

(One pixel of QSC)x(20mV threshold)

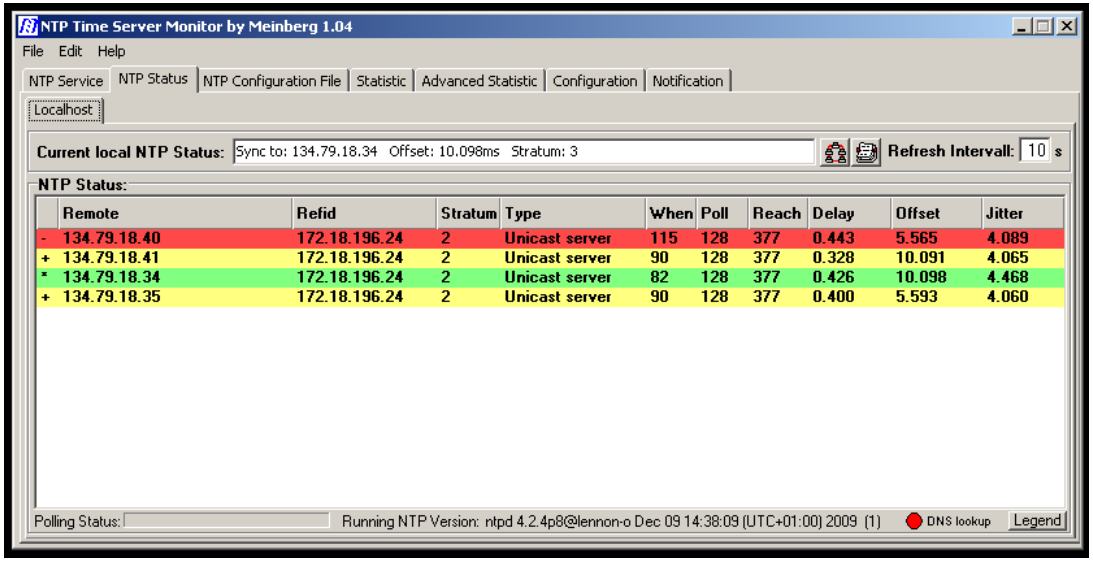
Data rate in USBWC 0.1event/s

dst file

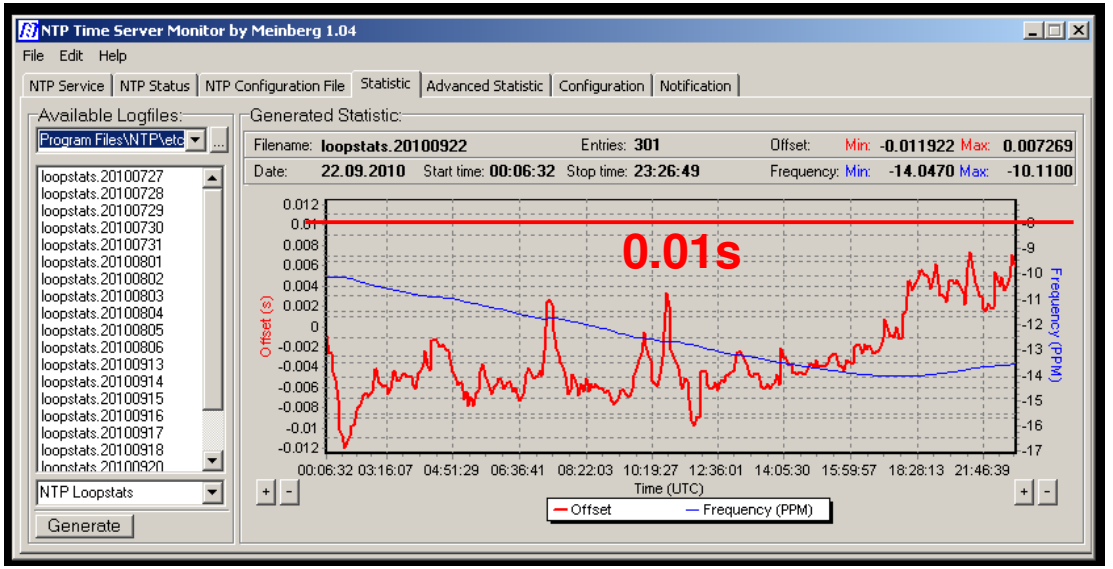


Time synchronization monitoring

- Time can be updating from 4 different ntp servers.



- Log information



As I was told CRT DAQ have same precision

Monitoring of the system time updating is very important since we need to be synchronized with CRT DAQ

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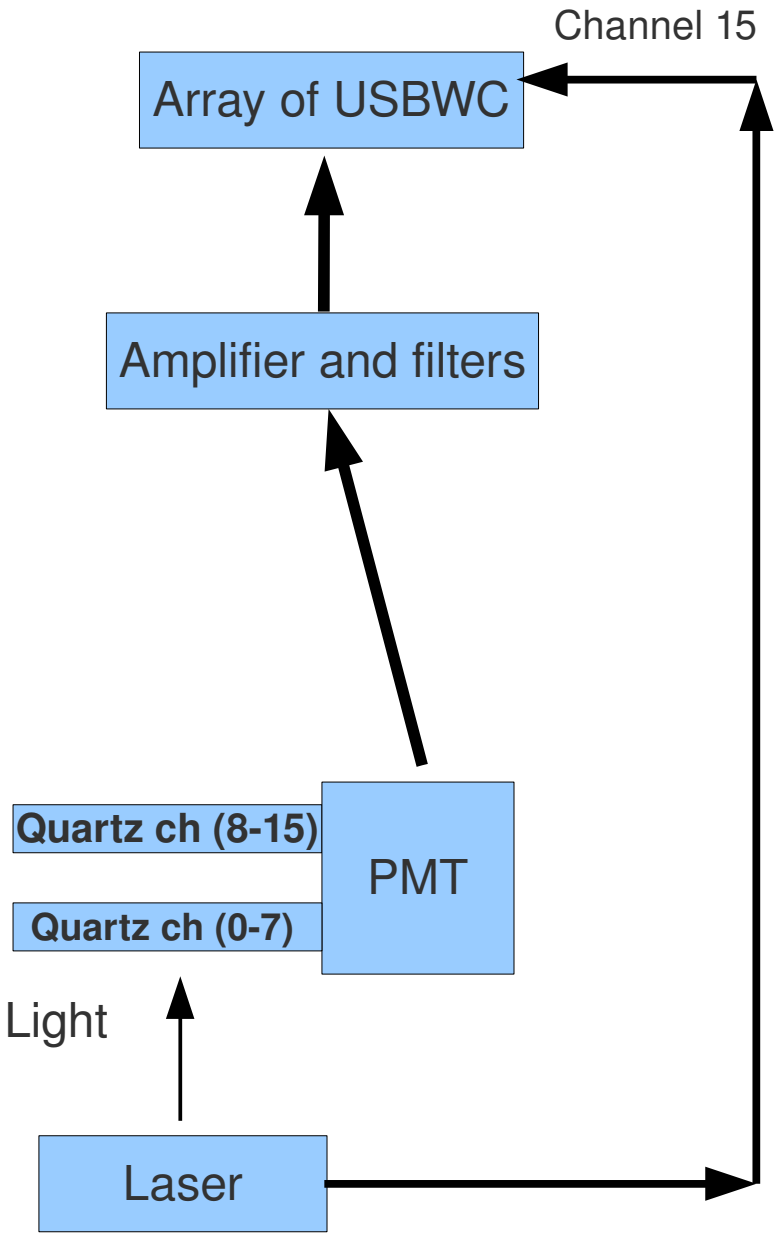
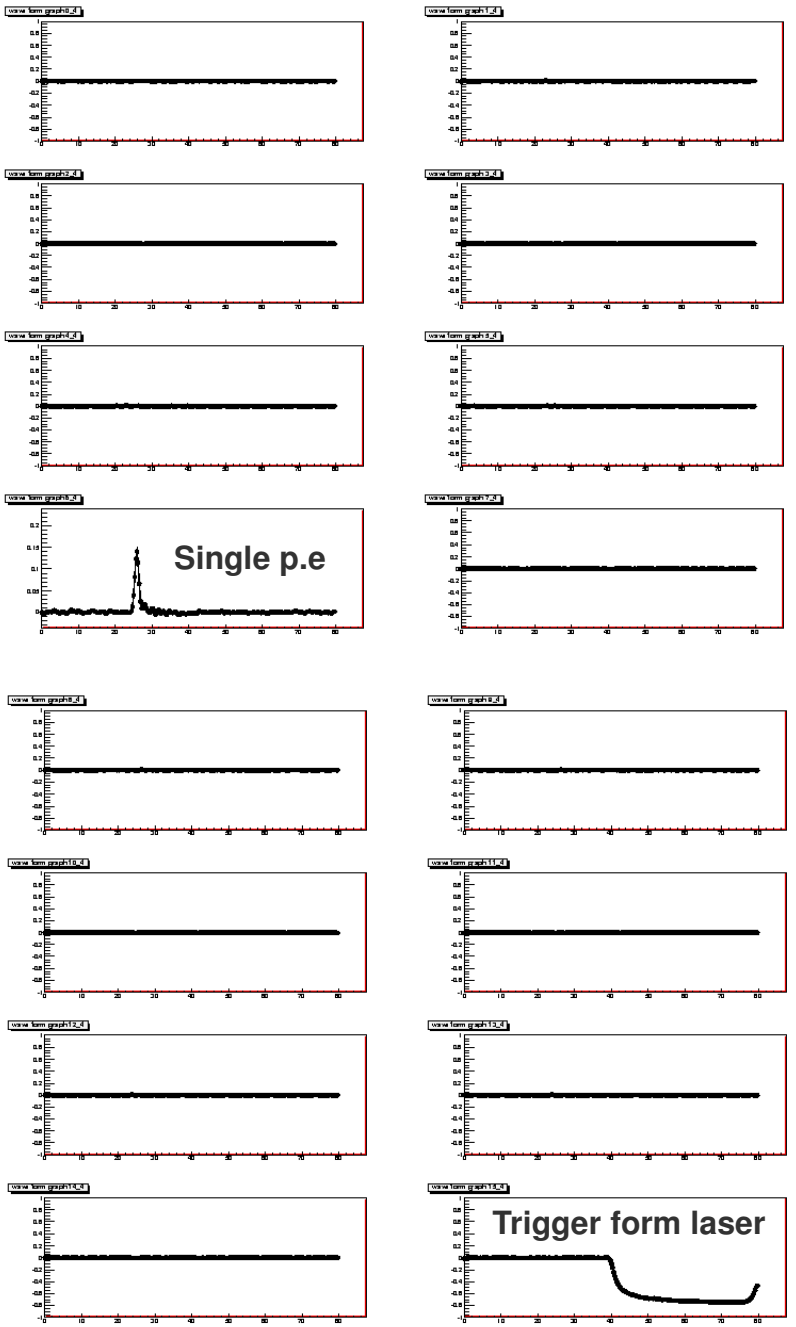
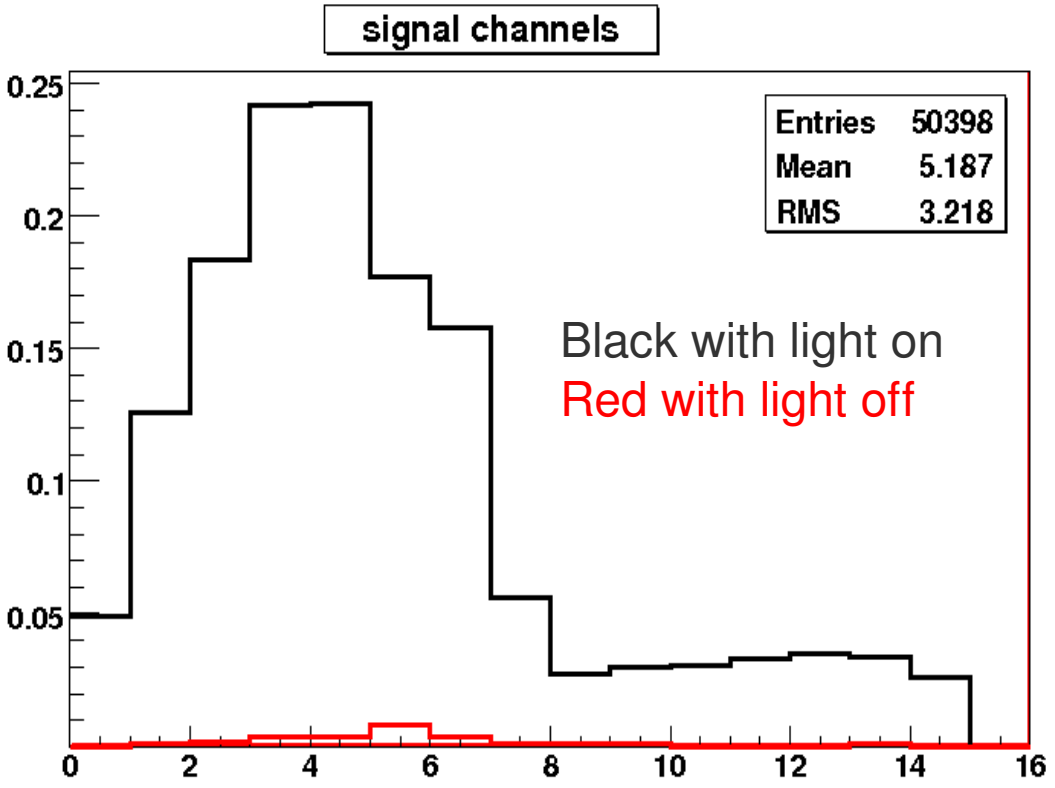
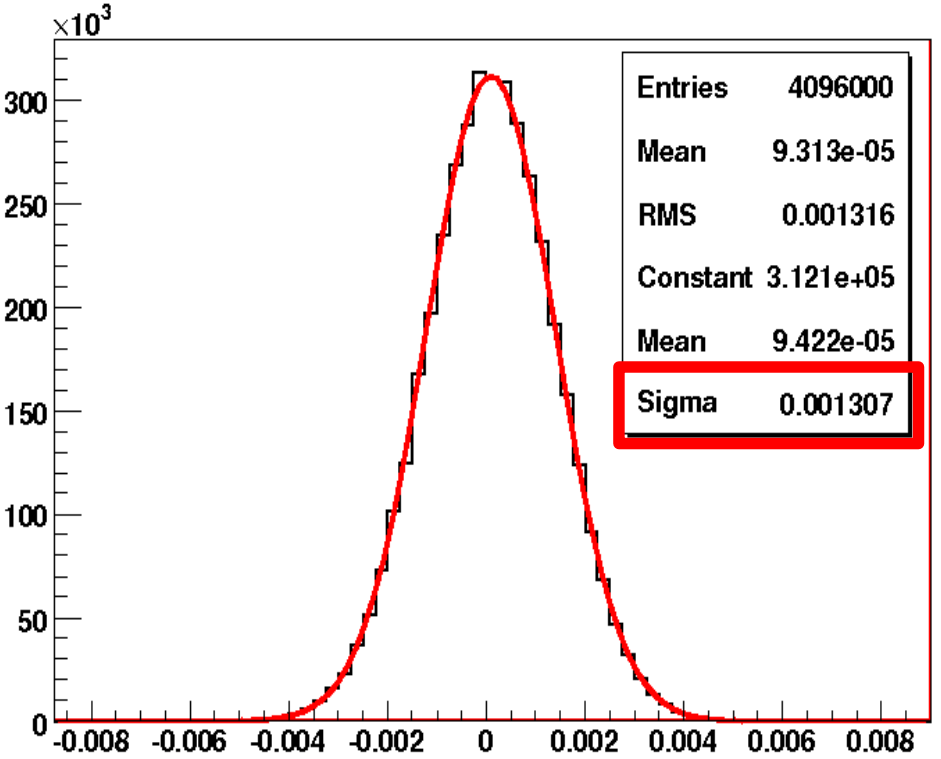
Run with laser(0)





Run with laser(1)



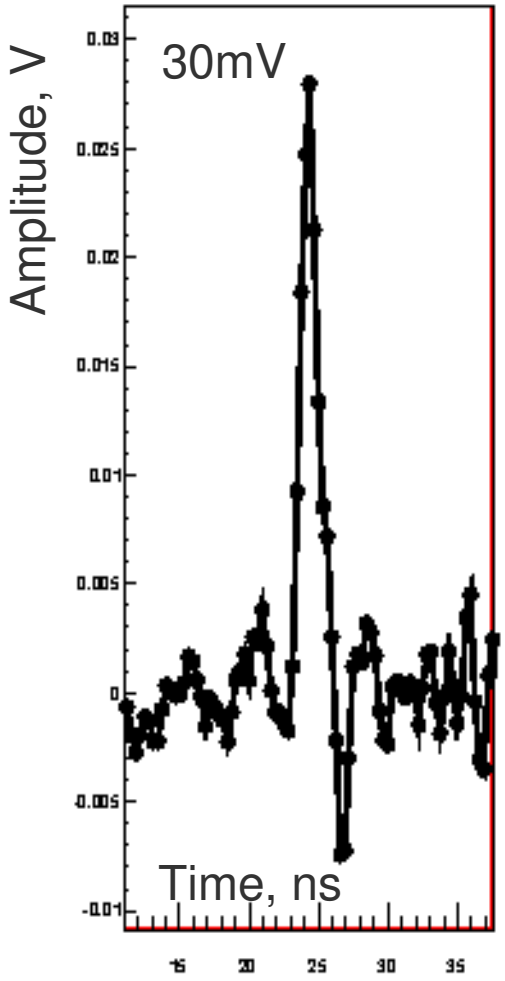


Histograms normalized by number of events

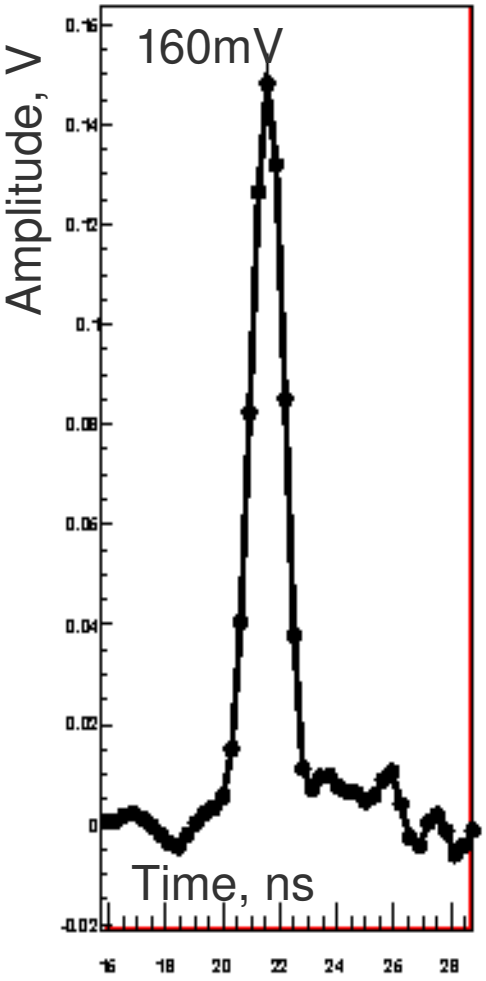
We select signals with amplitude > 50mV

RMS of the noise 1.3mV

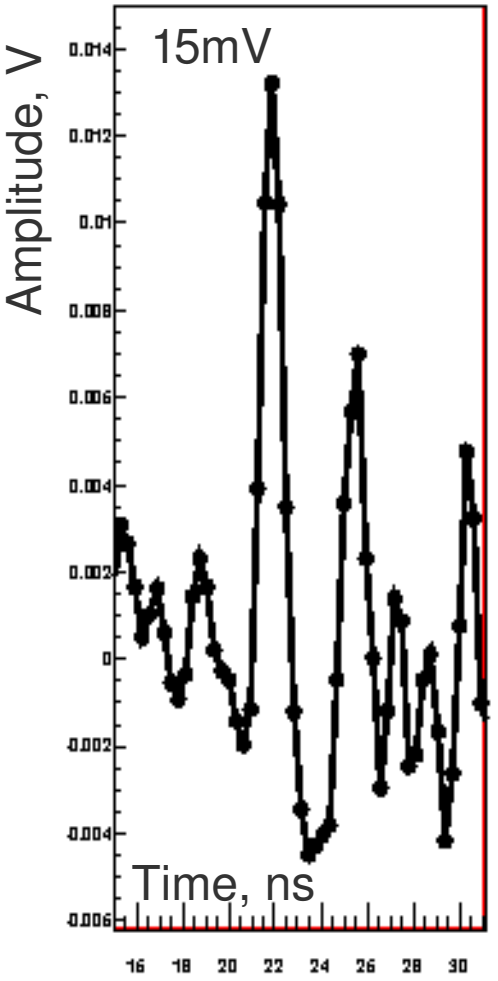
Run with laser(2), crosstalk and charge sharing



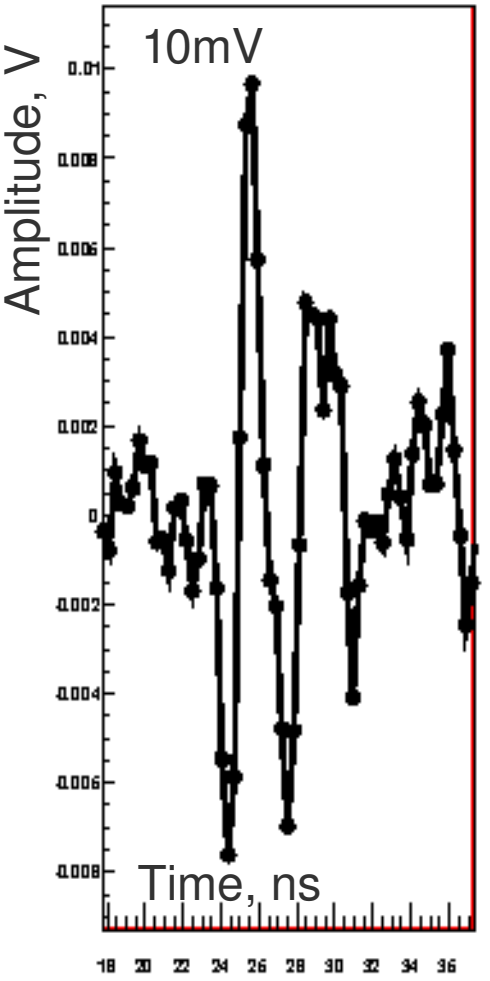
Charge sharing



Single p.e signal



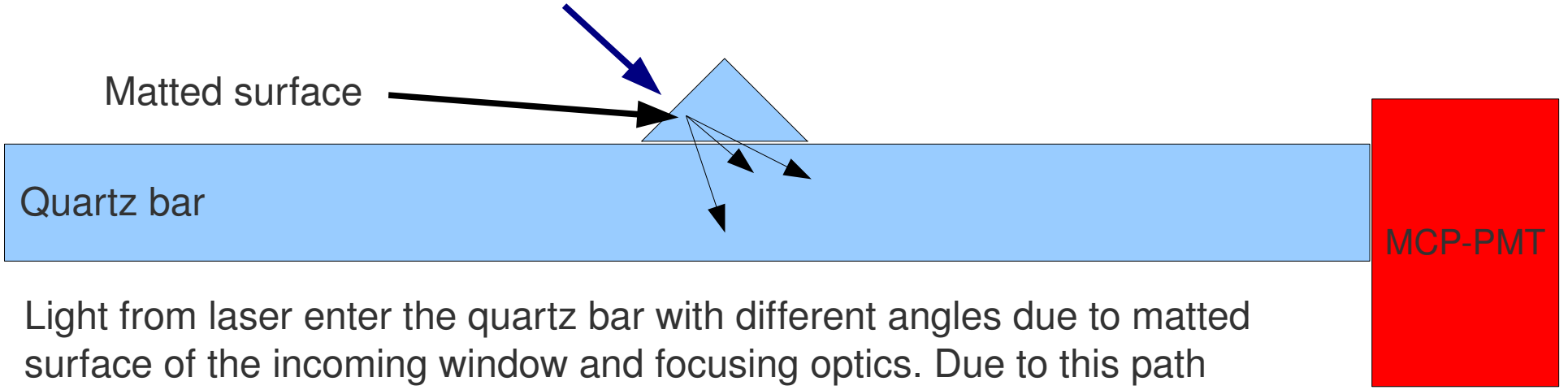
Charge sharing



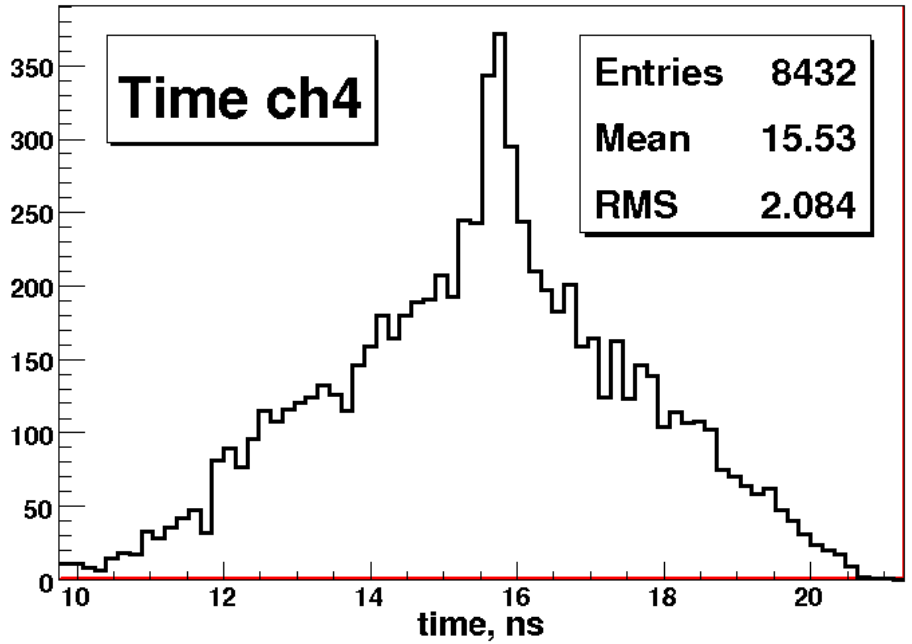
Crosstalk

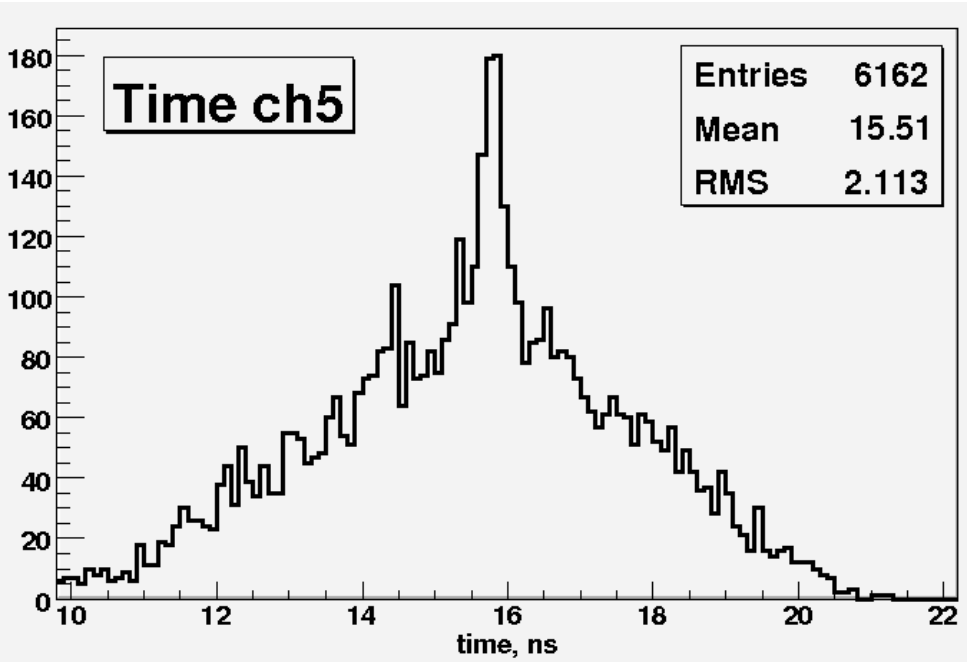
- Signal amplitude more then 50mV (40 noise RMS)
- Charge sharing amplitude is changing a lot , average (10-20)mV (8 noise RMS)
- Crosstalk amplitude is around 6-8 mv (6 noise RMS)

Run with laser(3), time distribution



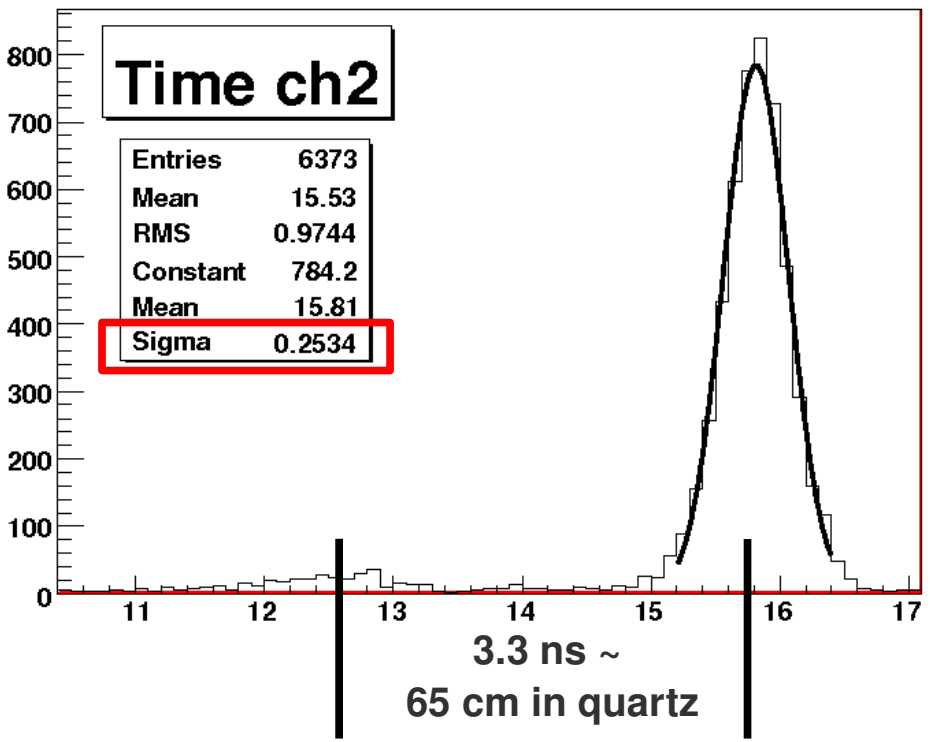
Light from laser enter the quartz bar with different angles due to matted surface of the incoming window and focusing optics. Due to this path propagation of the light touching given channel is very different. So the time difference between trigger and signal from given channel have very wide distribution.

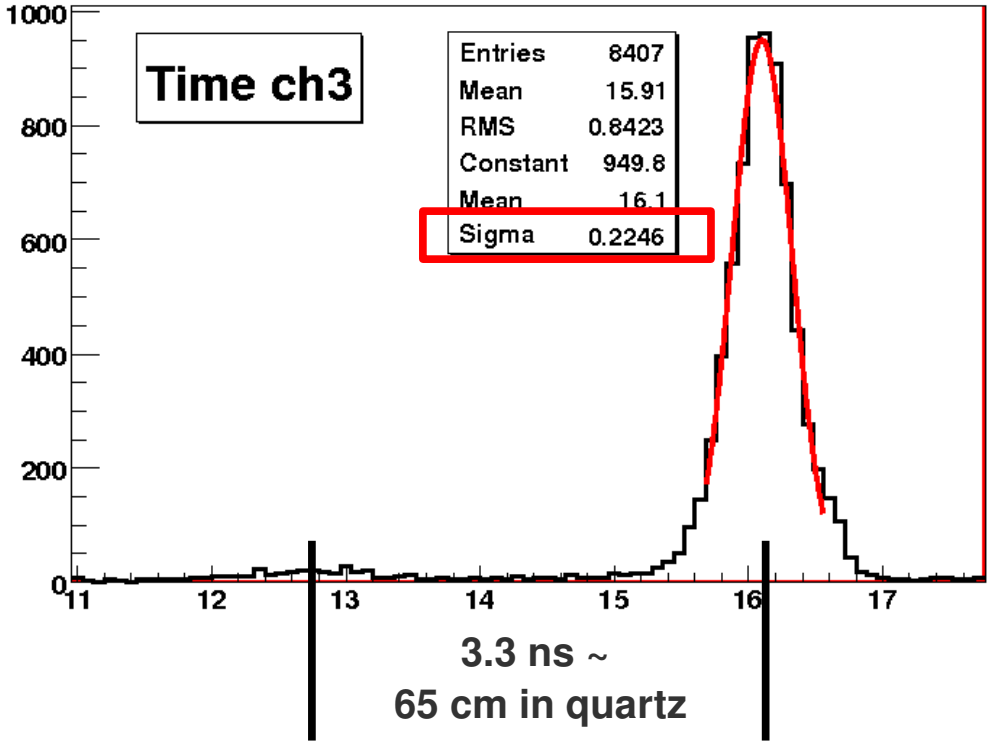




Run with laser(4), time distribution

But some channels have not very wide distributions.

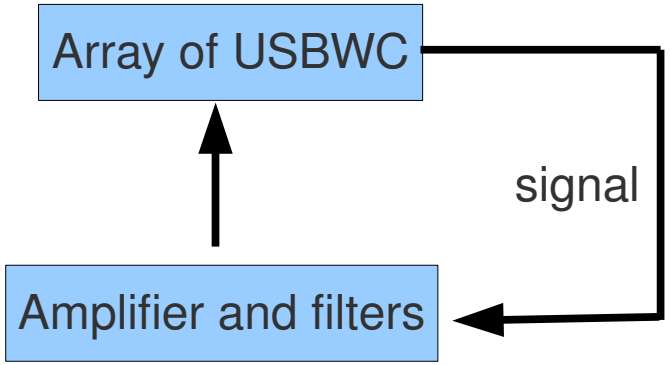




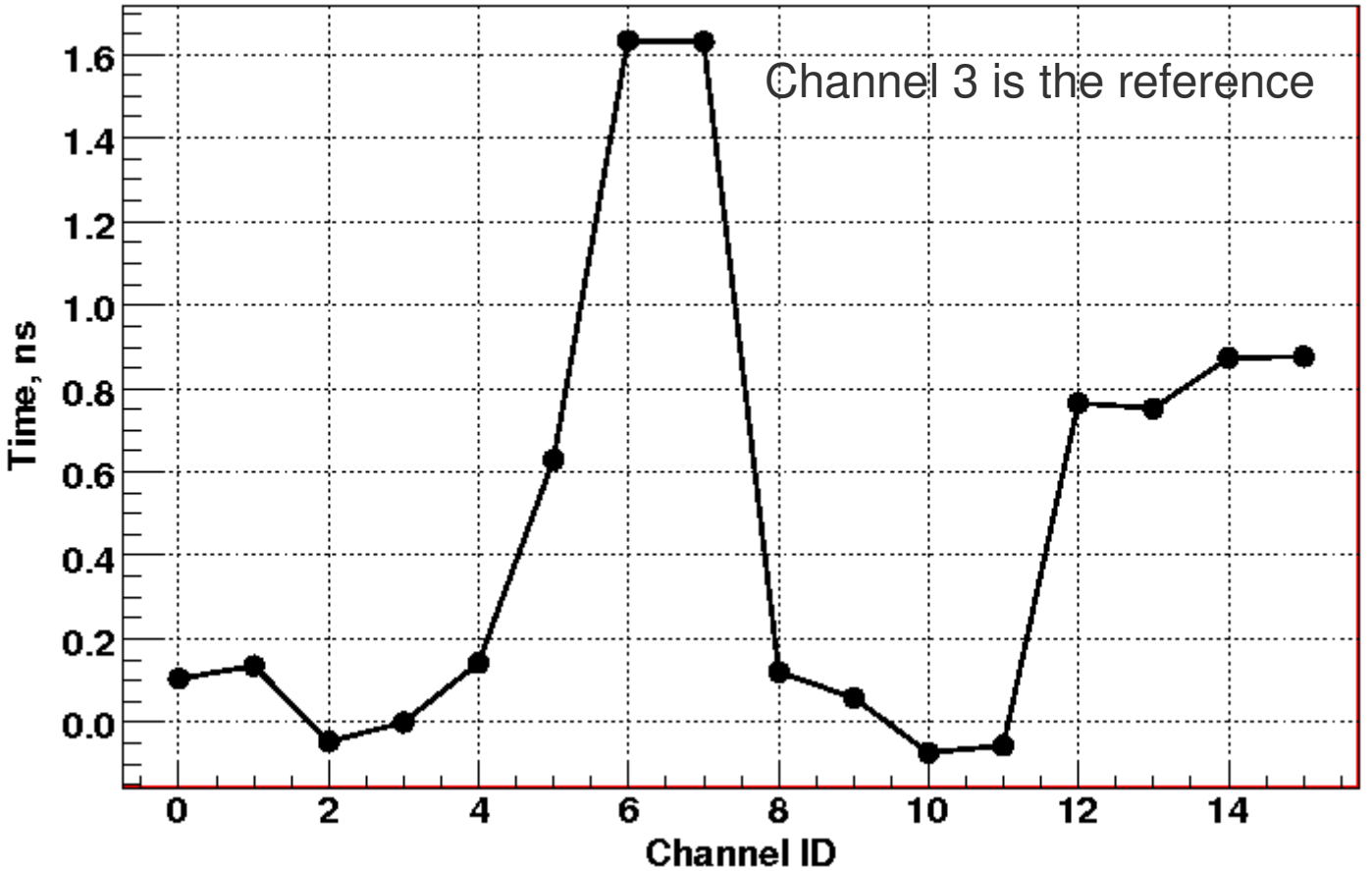
This can be scattered back from the mirror photons

Calibration of the system without laser

Each channel has his own very stable bias. If we want to know which signal was first we need to have a map of this constant biases.



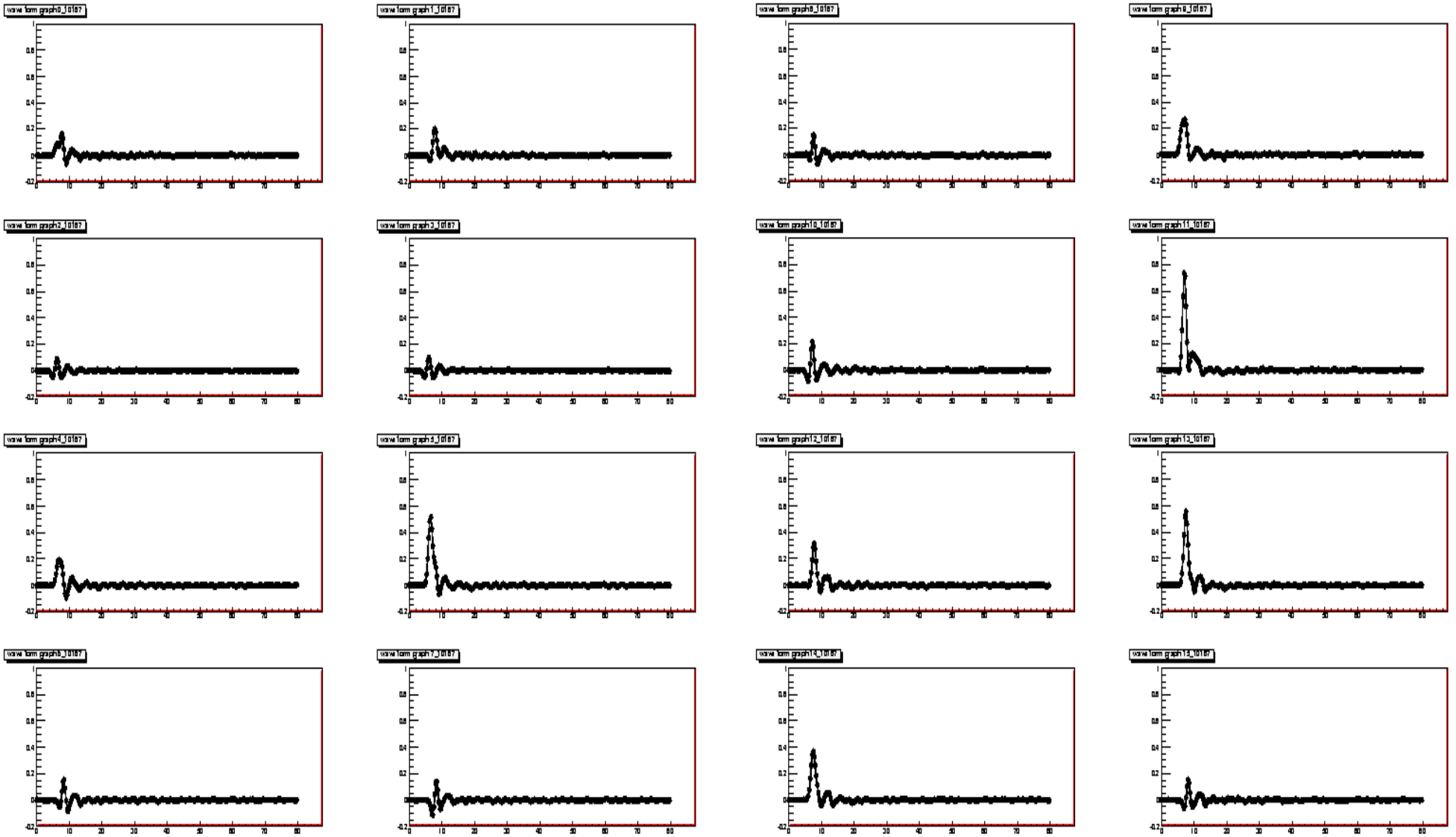
With this technique all system started from amplifiers and filters can be calibrated



Run with cosmic muons(0)

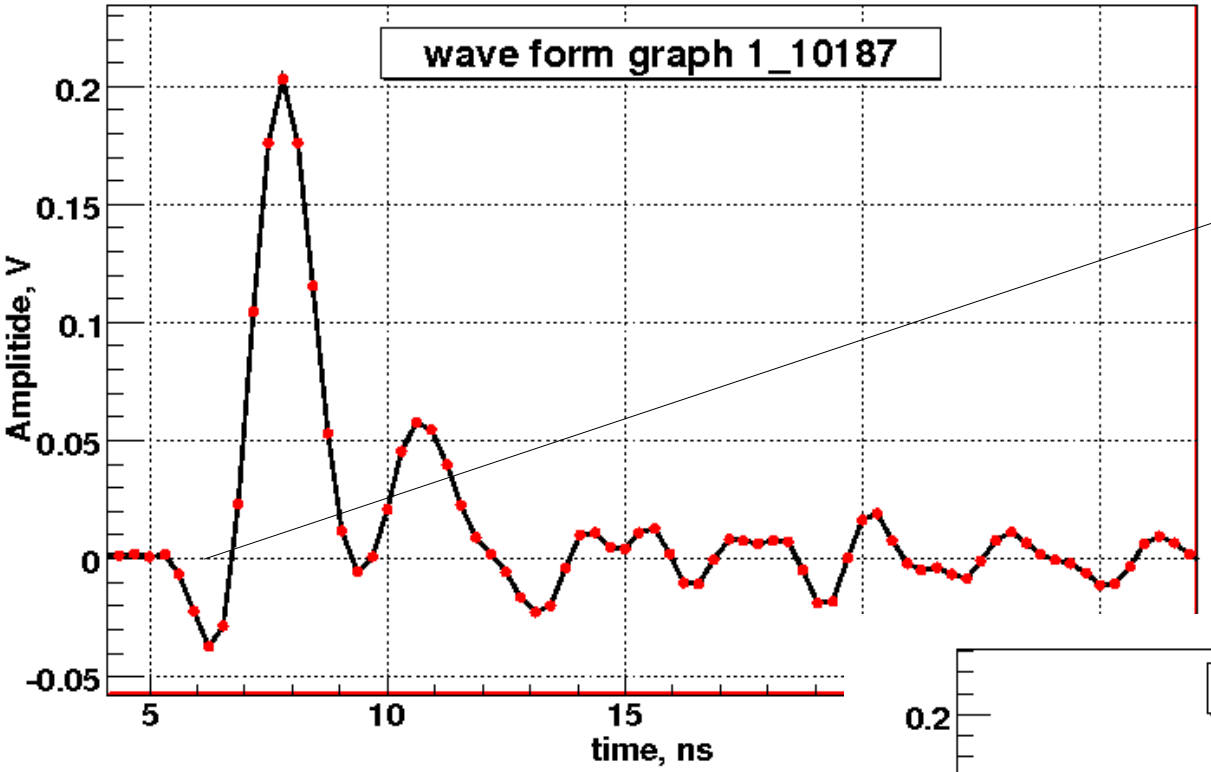
0 to 7

8 to 15

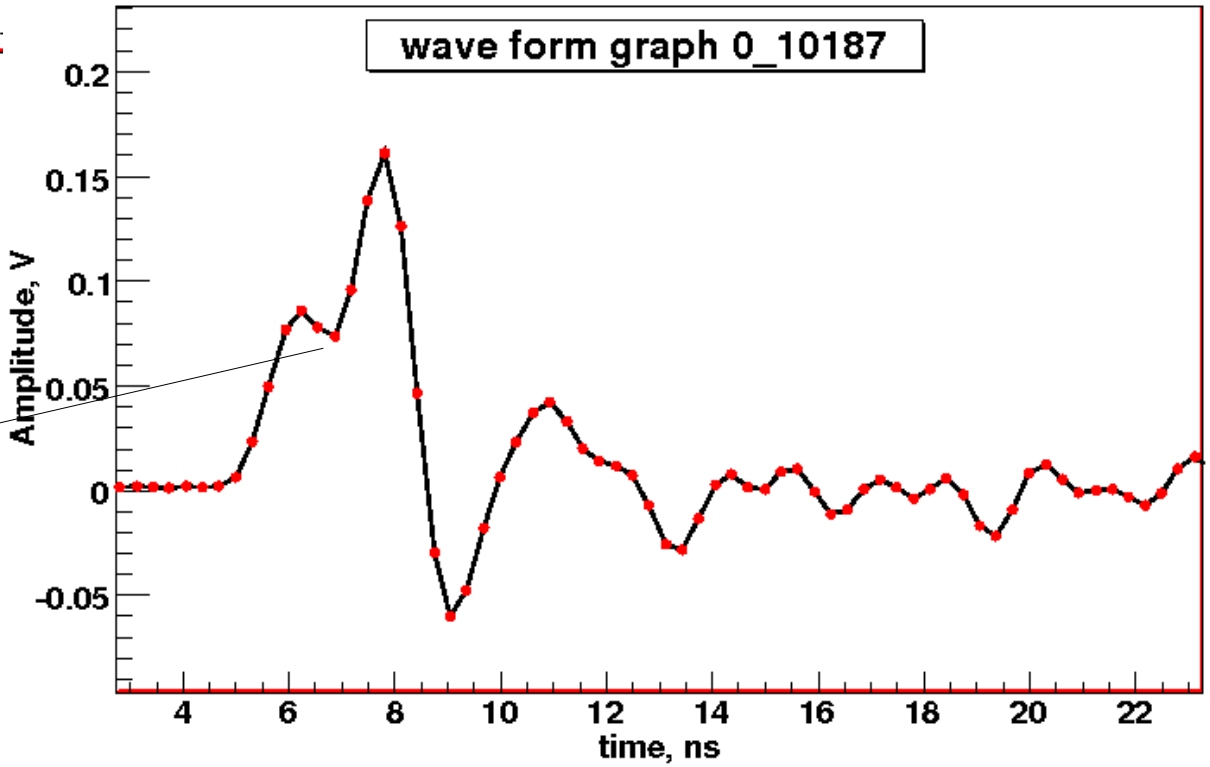


Vertical scale is from -0.2 to 1.0 V

Run with cosmic muons(1)



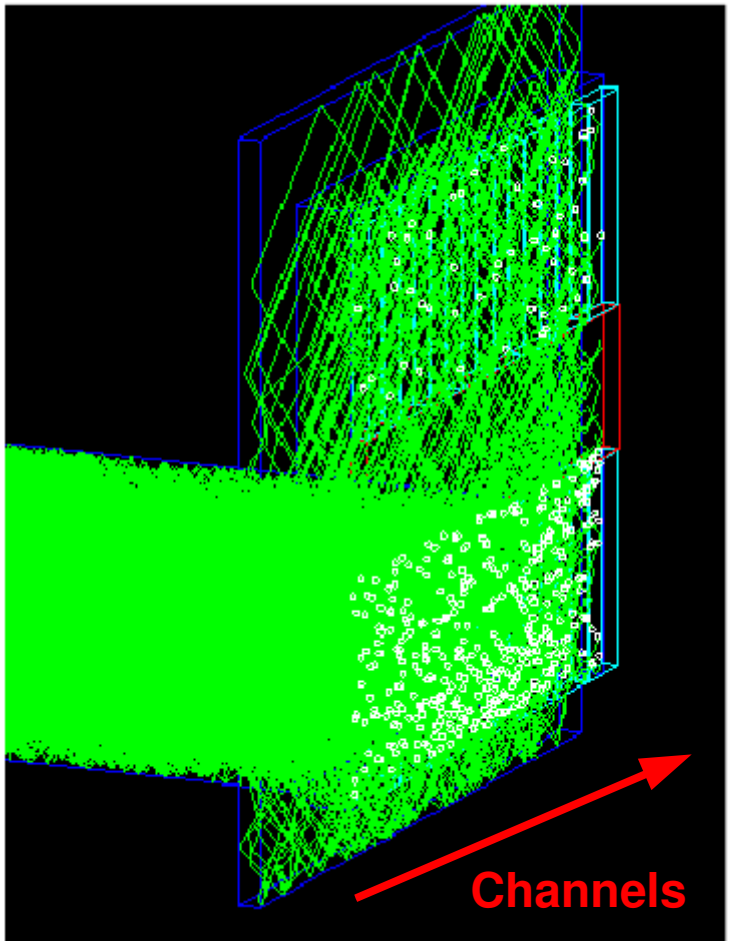
Amplitude same as signal, but beginning same as crosstalk

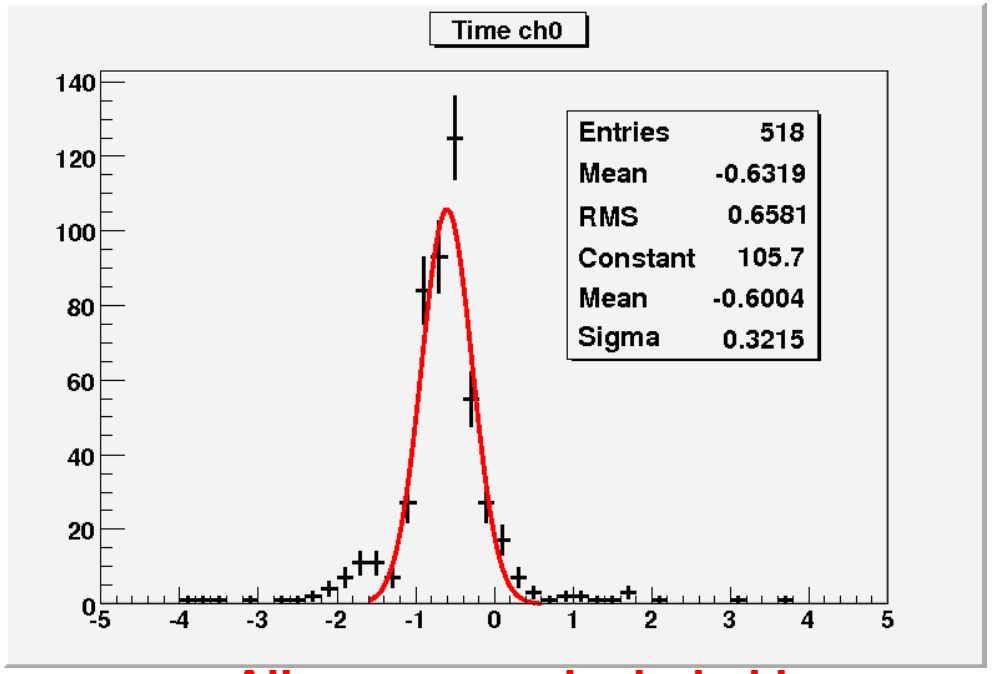


Two p.e. shifted in time ???

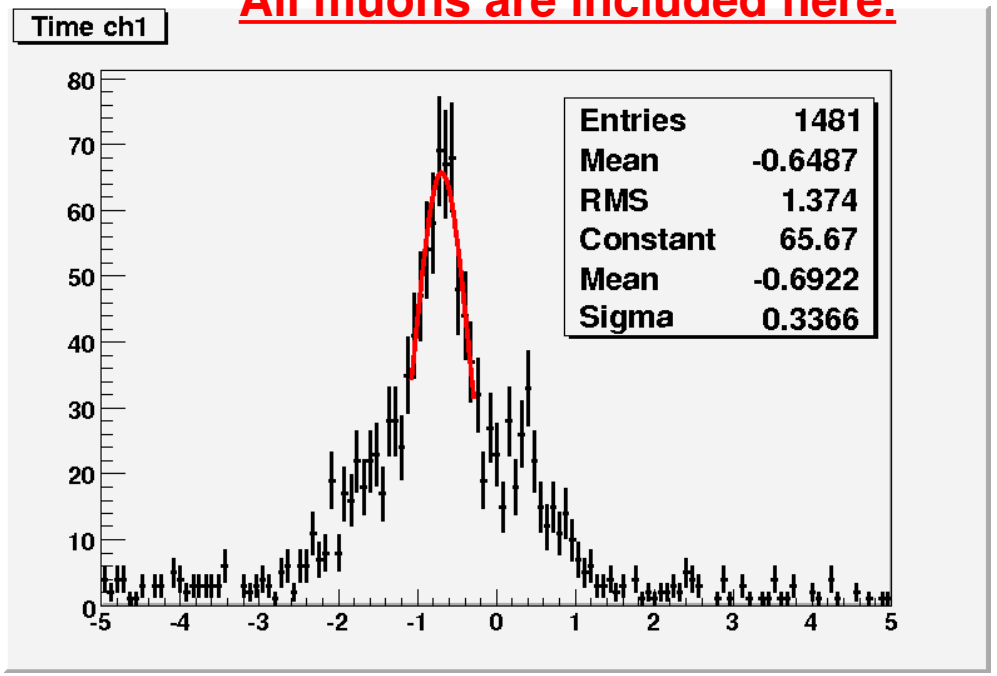
Run with cosmic muon(2)

We substruct $ch_0 - ch_8$; $ch_1 - ch_9$ .....





All muons are included here.



NOTE:
Information from
CRT does not used

Conclusion

1) fTOF prototype was installed at SLAC CRT. It taking date at present moment.
2) Electronics connected, checked and calibrated.
3) First analysis of data from laser run has been started, rough information about signal, noise, crosstalk, charge sharing were obtained.
4) Analysis of the cosmic muon data has been started

BACKUP