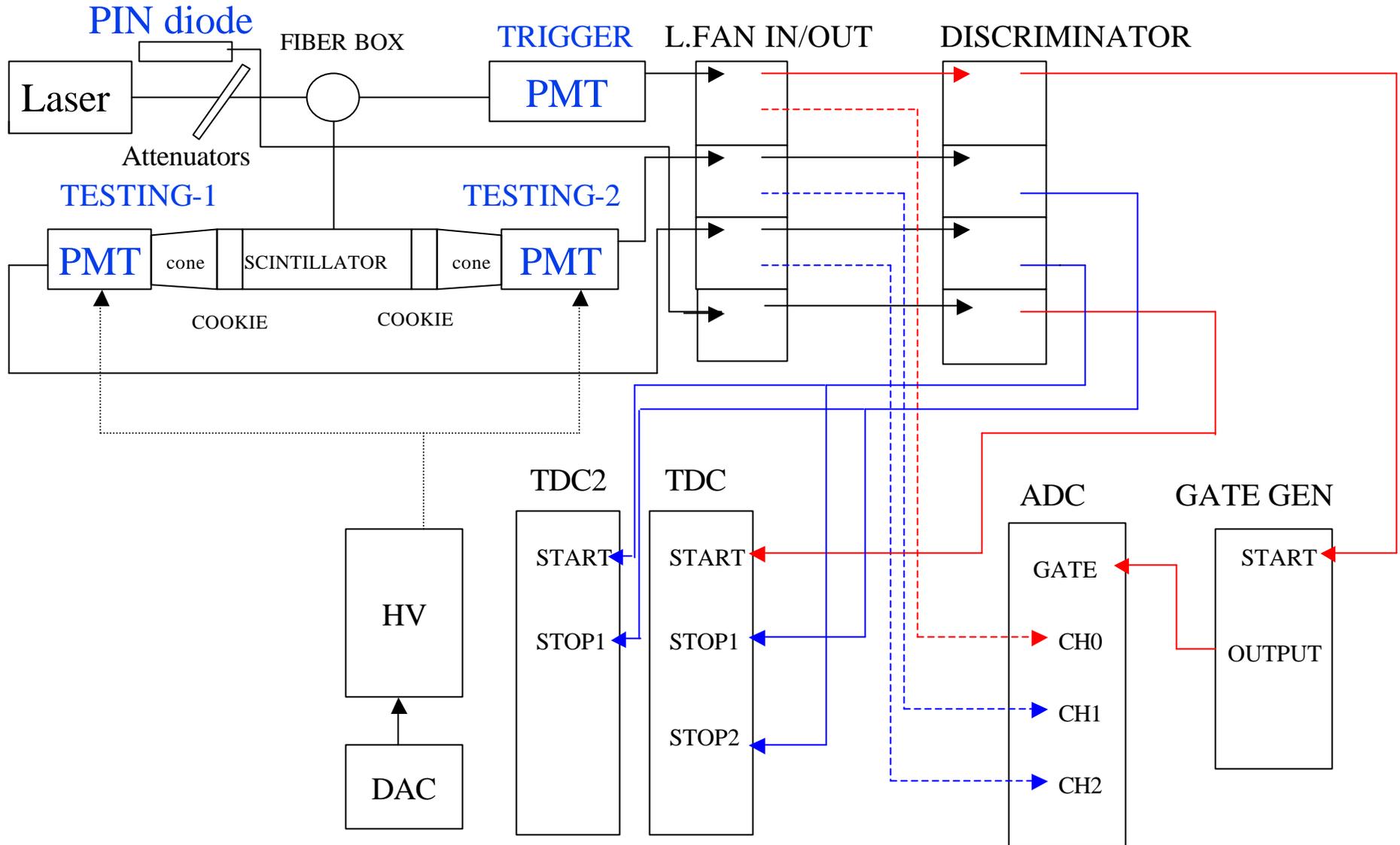


PMT Calibration @ FNAL (status report)

S. Cabrera, Y. Oh, T. Rodrigo and I.Vila

- Outline
 - Test layout.
 - PMT inventory and current calibration status.
 - Gain measurements.
 - Timing measurements.
 - Conclusions.

PMT Calibration @ B0: current setup

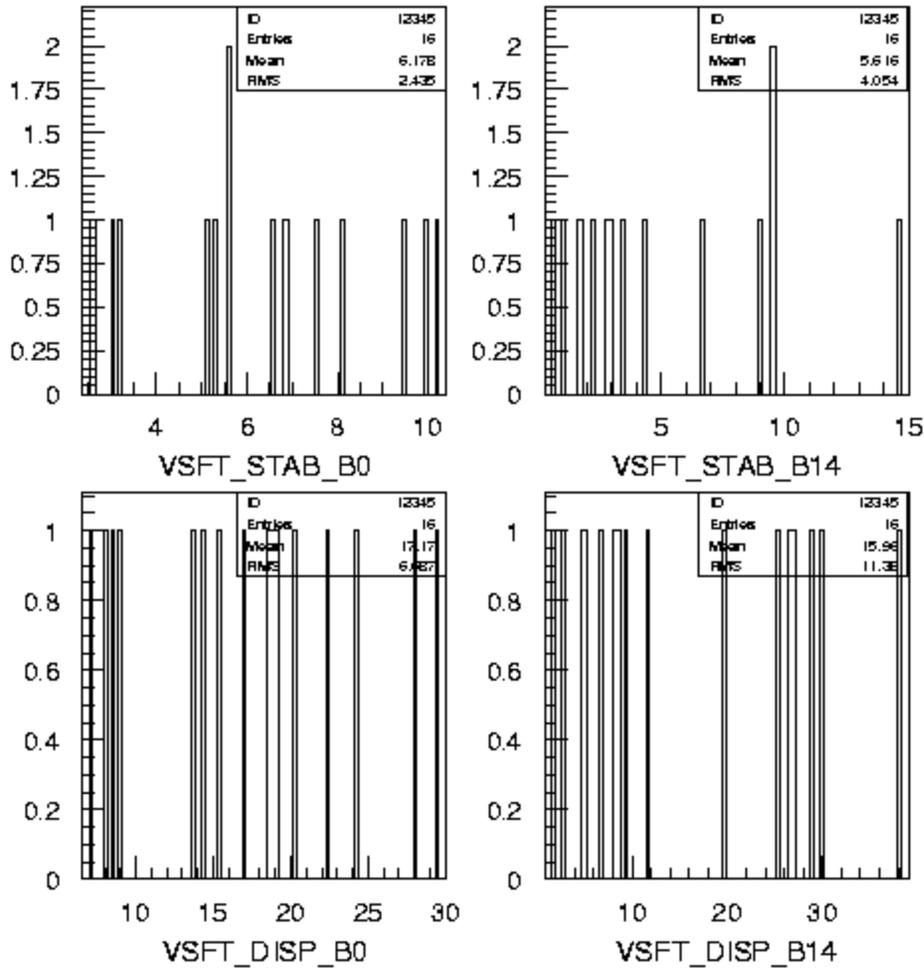


Test layout

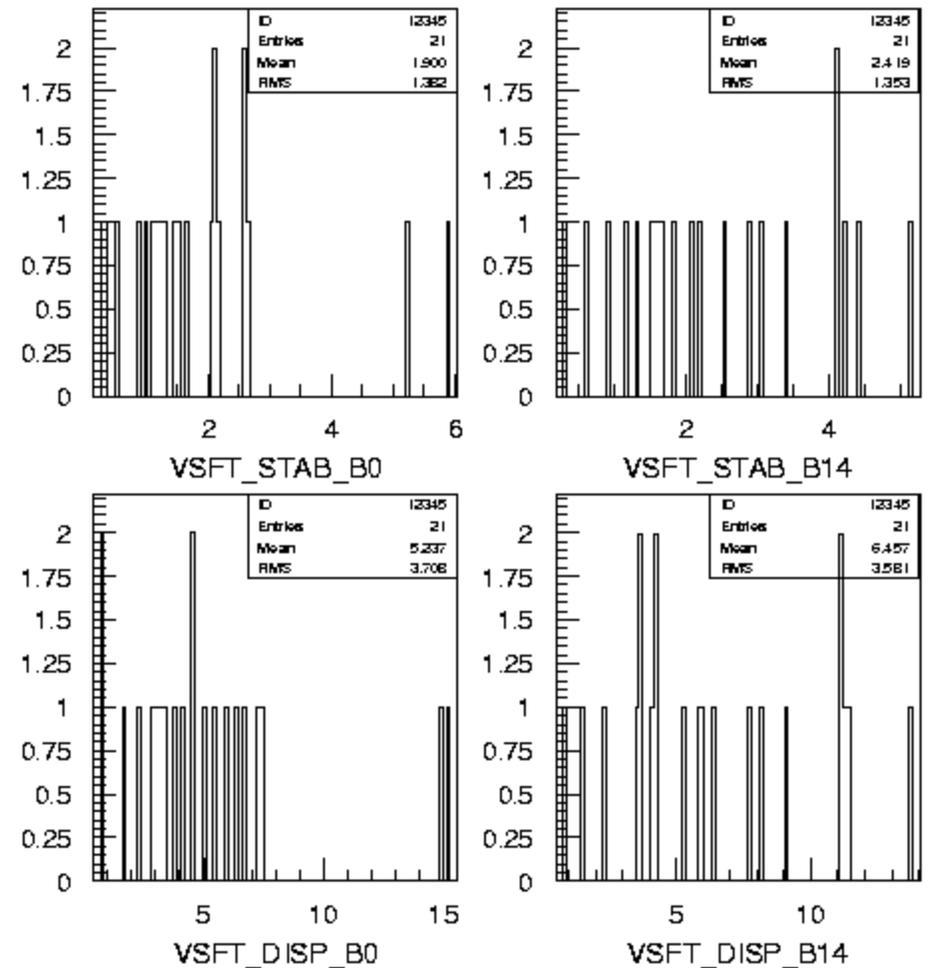
- The timing measurement is done using a PIN diode
 - The intrinsic time jitter of the pin is negligible. ($< 10\text{ps}$)
 - The time resolution is now driven by the testing PMTs
- The light output monitoring is done using the trigger PMT (for mechanical stability reasons)
- The new laser is more stable.
- We are still using the “old” cable dummy preamp.

Laser stability

Old laser stability (%)



New laser stability(%)



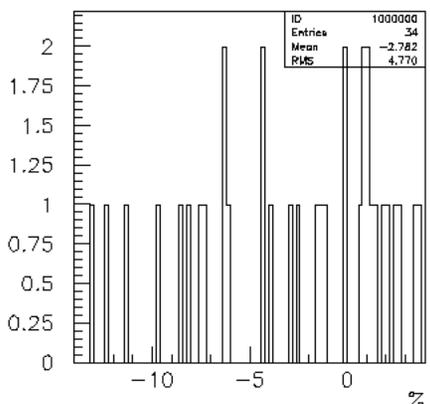
PMT inventory and current calibration status.

- The figures are:
 - Total number of PMT received 91(test stand) + 6 (lab 6).
 - Total number of PMT tested 57
 - We are calibrating ~ 16 per day.

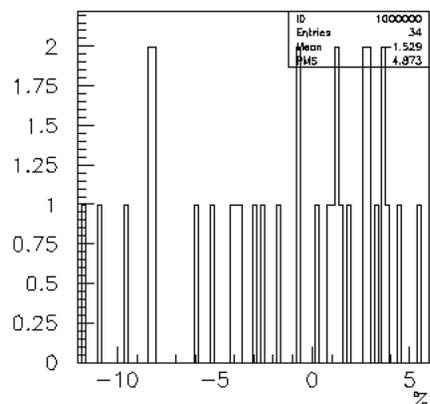
Gain measurement: exponent

Old setup

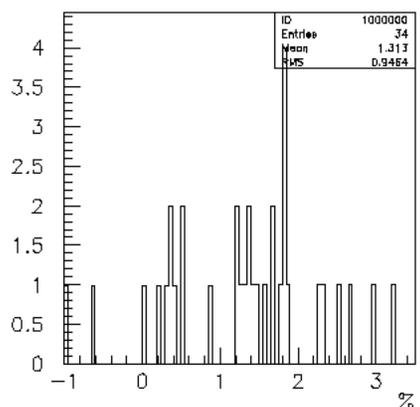
(FNAL-PENN) Gain Exponent $B=0$



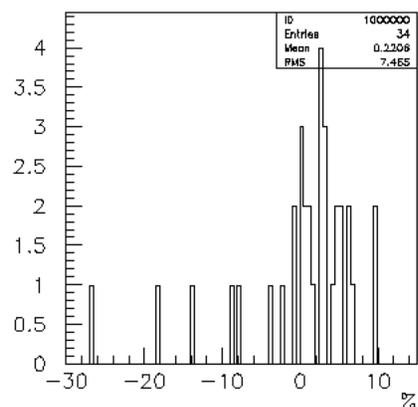
(FNAL-TSU) Gain Exponent $B=0$



(PENN-TSU) Gain Exponent $B=0$

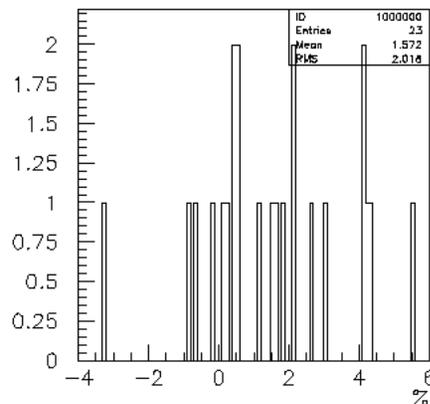


(FNAL-TSU) Gain Exponent $B=1.4$

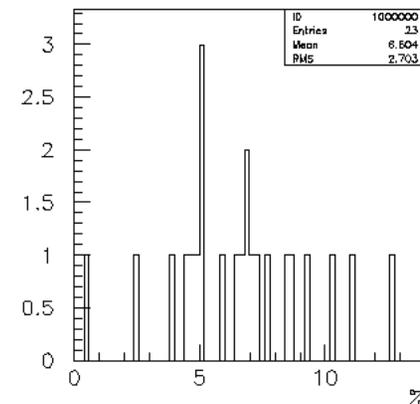


New setup

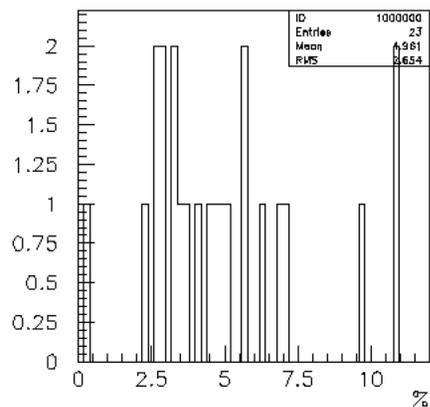
(FNAL-PENN) Gain Exponent $B=0$



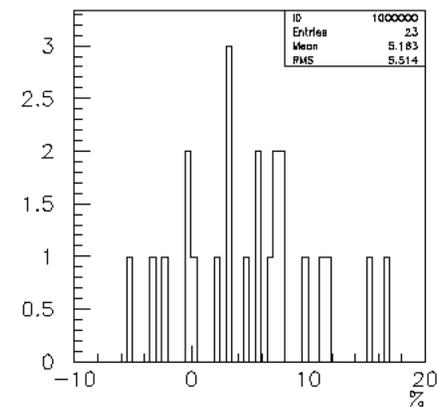
(FNAL-TSU) Gain Exponent $B=0$



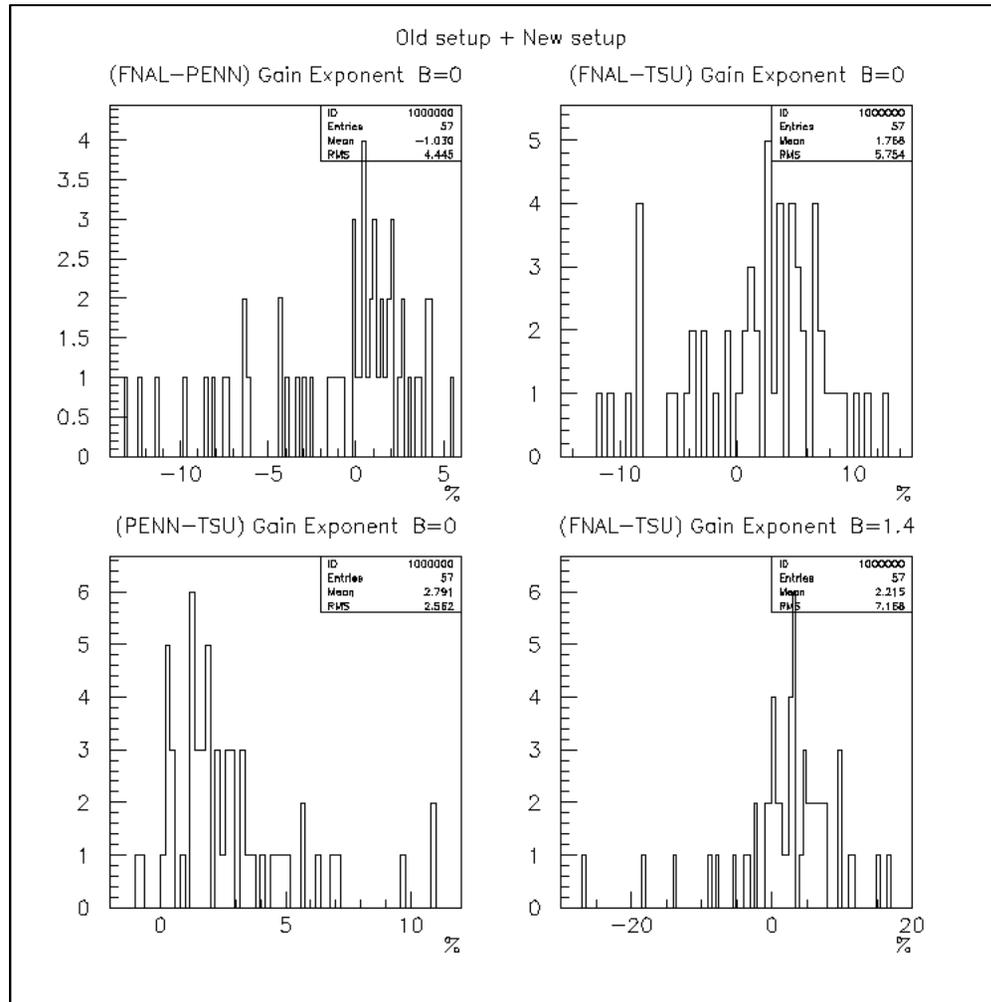
(PENN-TSU) Gain Exponent $B=0$



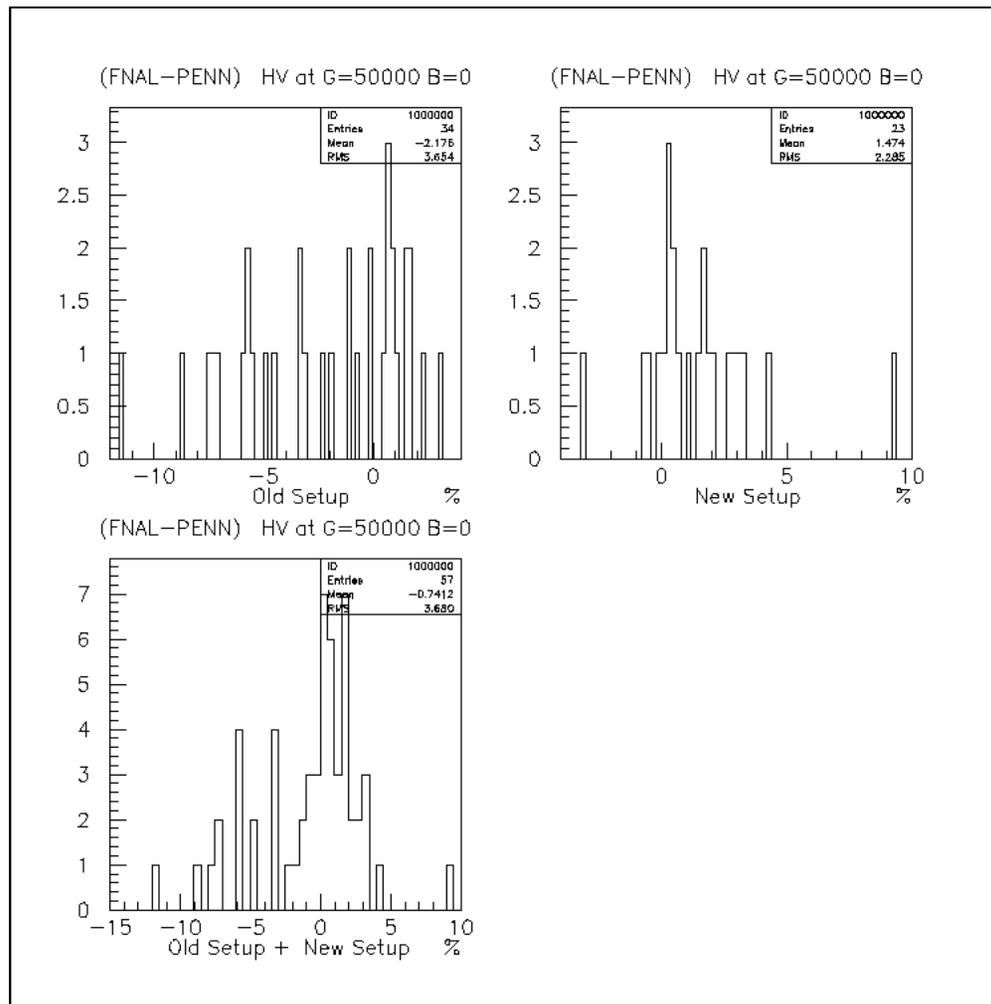
(FNAL-TSU) Gain Exponent $B=1.4$



Gain measurement:exponent

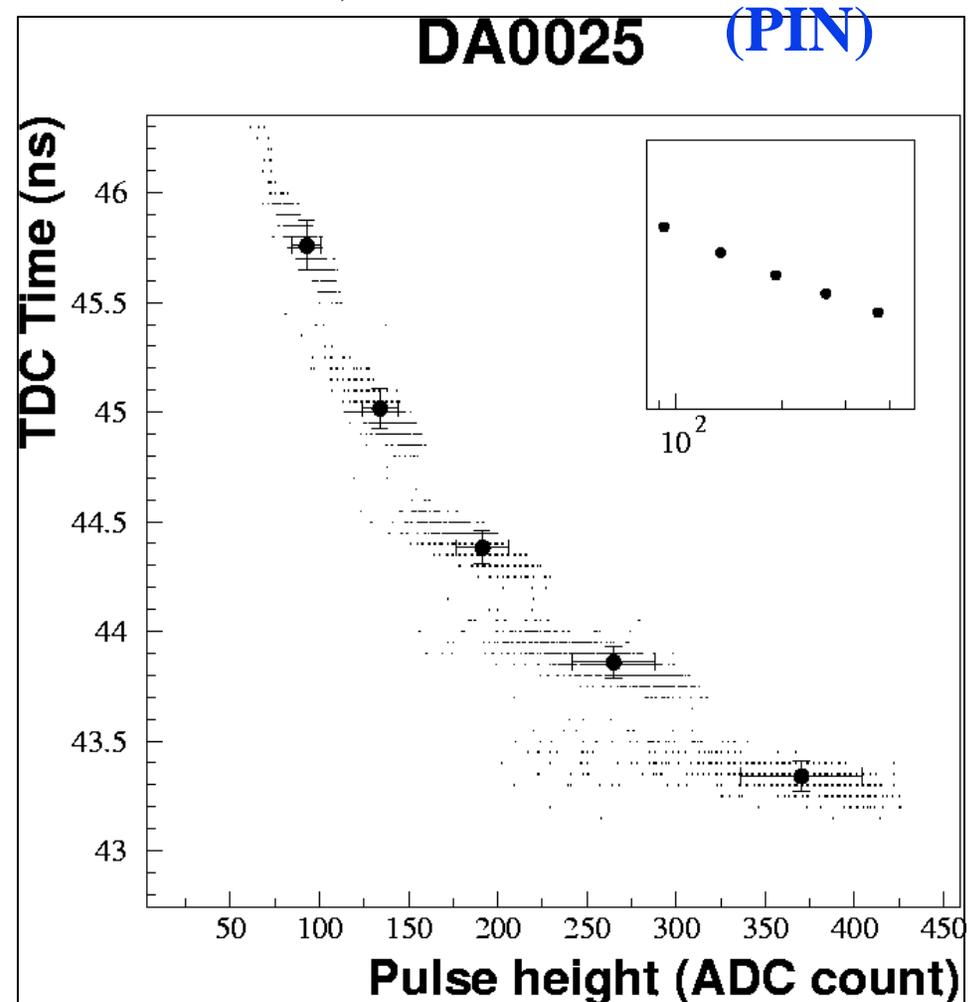
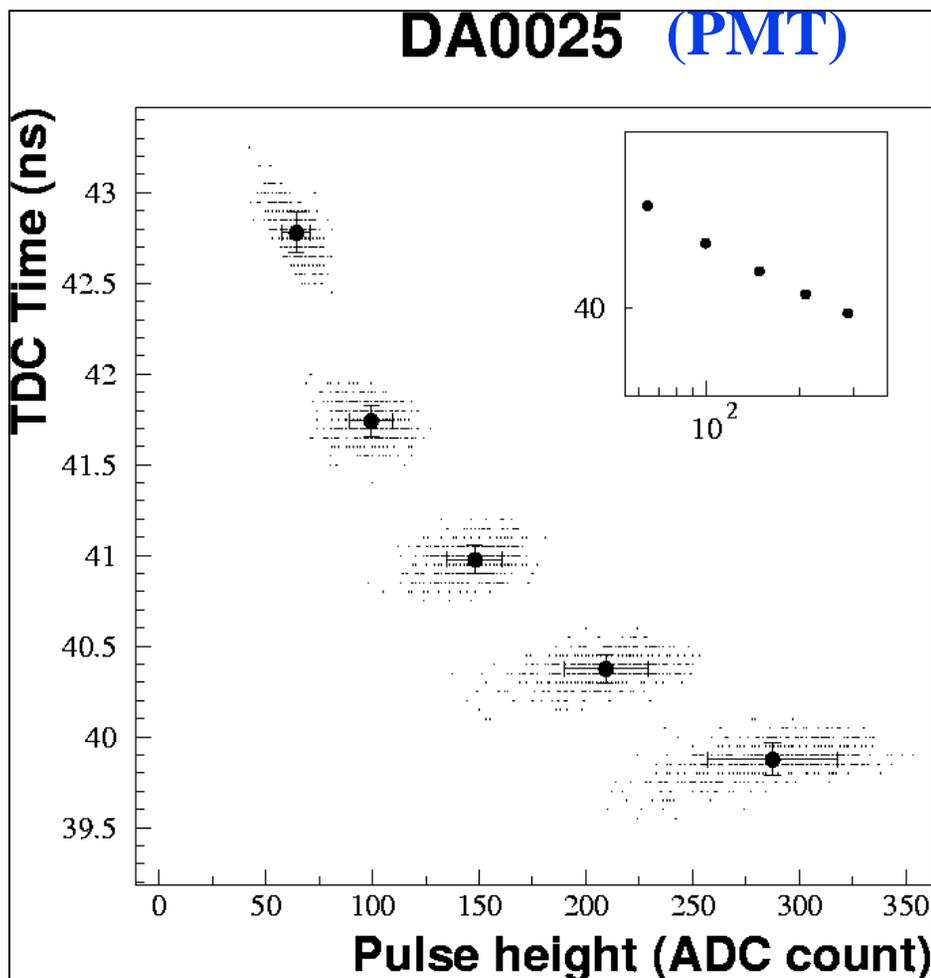


Gain measurement: HV @ Gain = 5×10^4

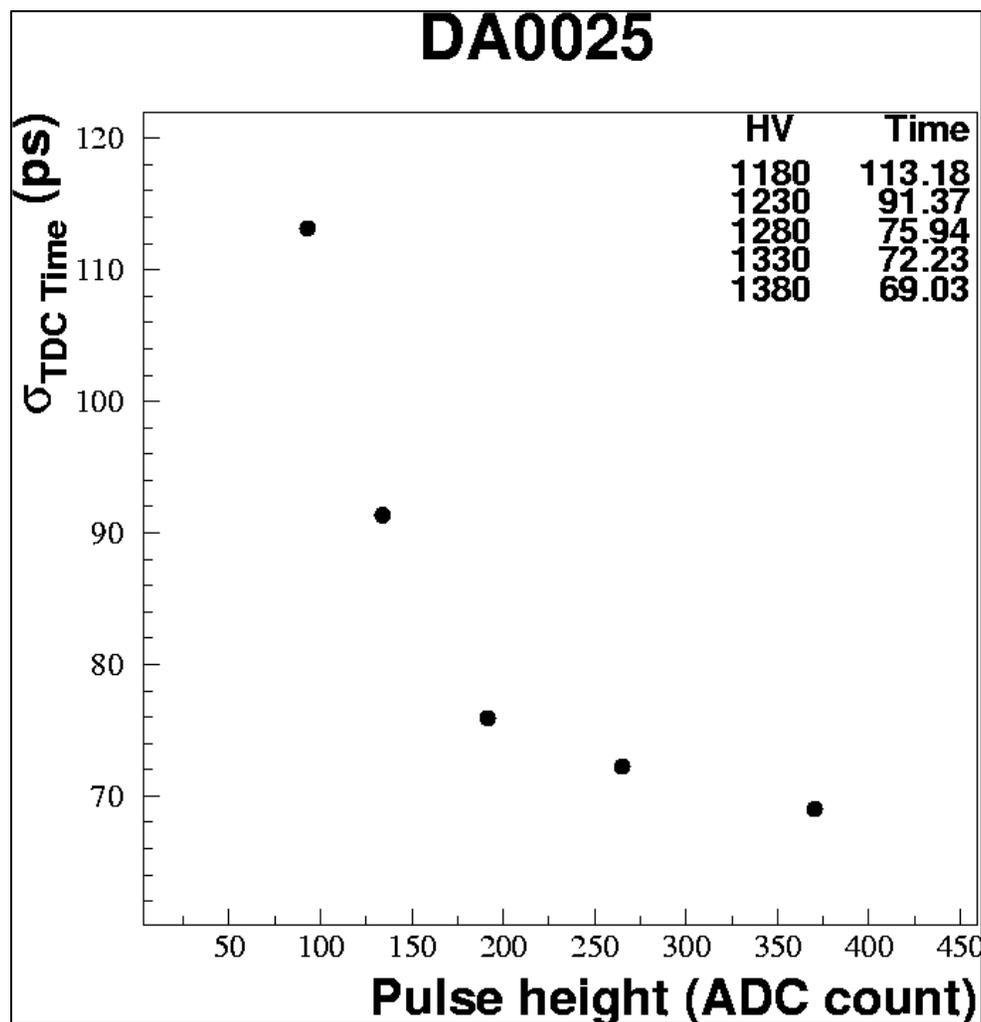


Timing measurements: mean values

- New PIN diode permit us to study the intrinsic timing characteristic of the PMT (measured time mean values and time resolutions).



Timing measurement: time resolution vs. HV



Conclusions and next steps

- After the last week interruption, we have resumed the calibration with:
 - The new laser that shows an improved light output stability.
 - A Pin diode that gives us a intrinsic timing measurement of the PMTs.
- A calibration rate ~ 16 PMTs per day which is expected to be improved once we have ready a second assembly.
- Still a more detailed analysis of the data has to be done.