

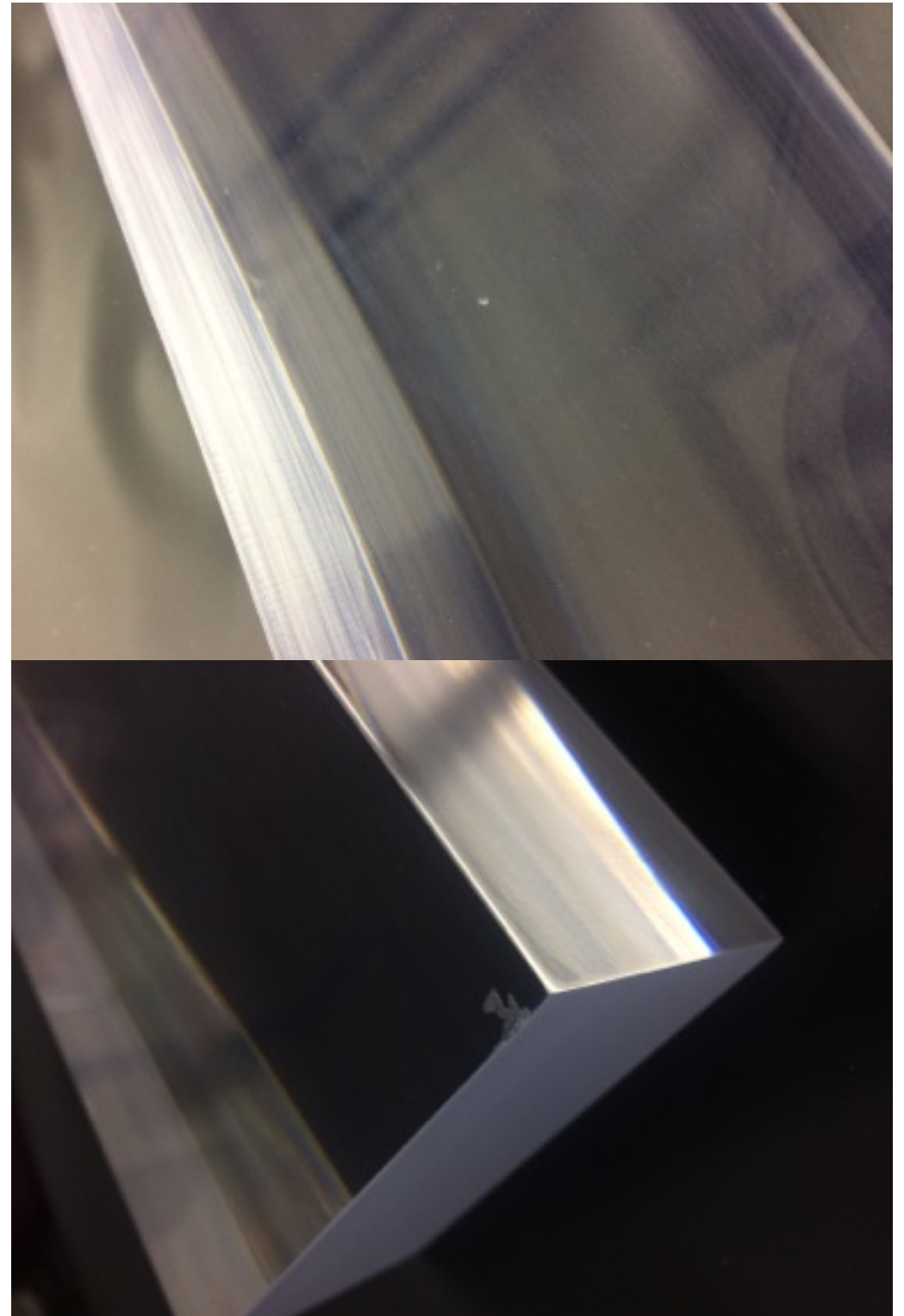
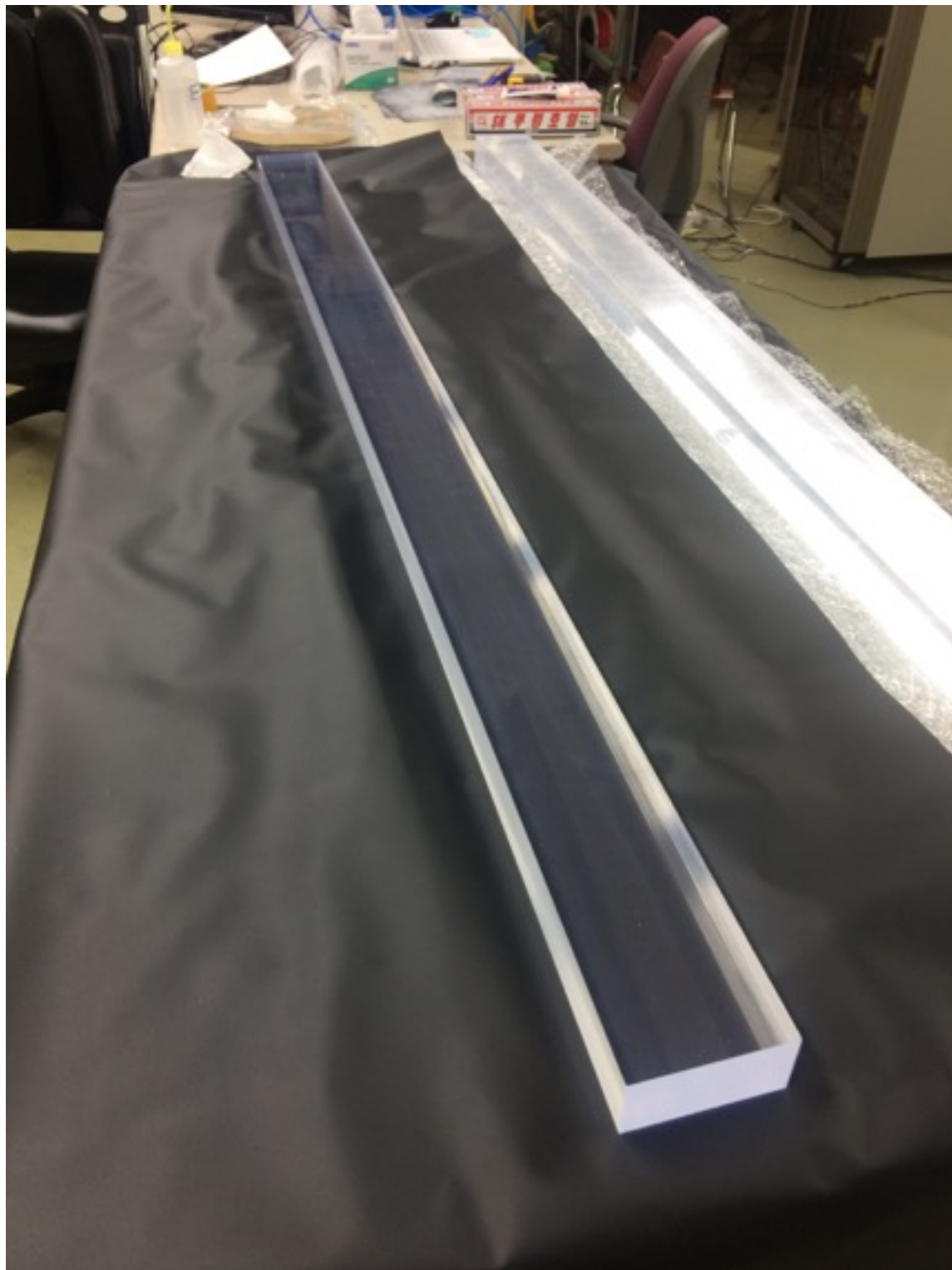
GBAR Meeting (SNU) (21 June 2016)

Jongwon Hwang

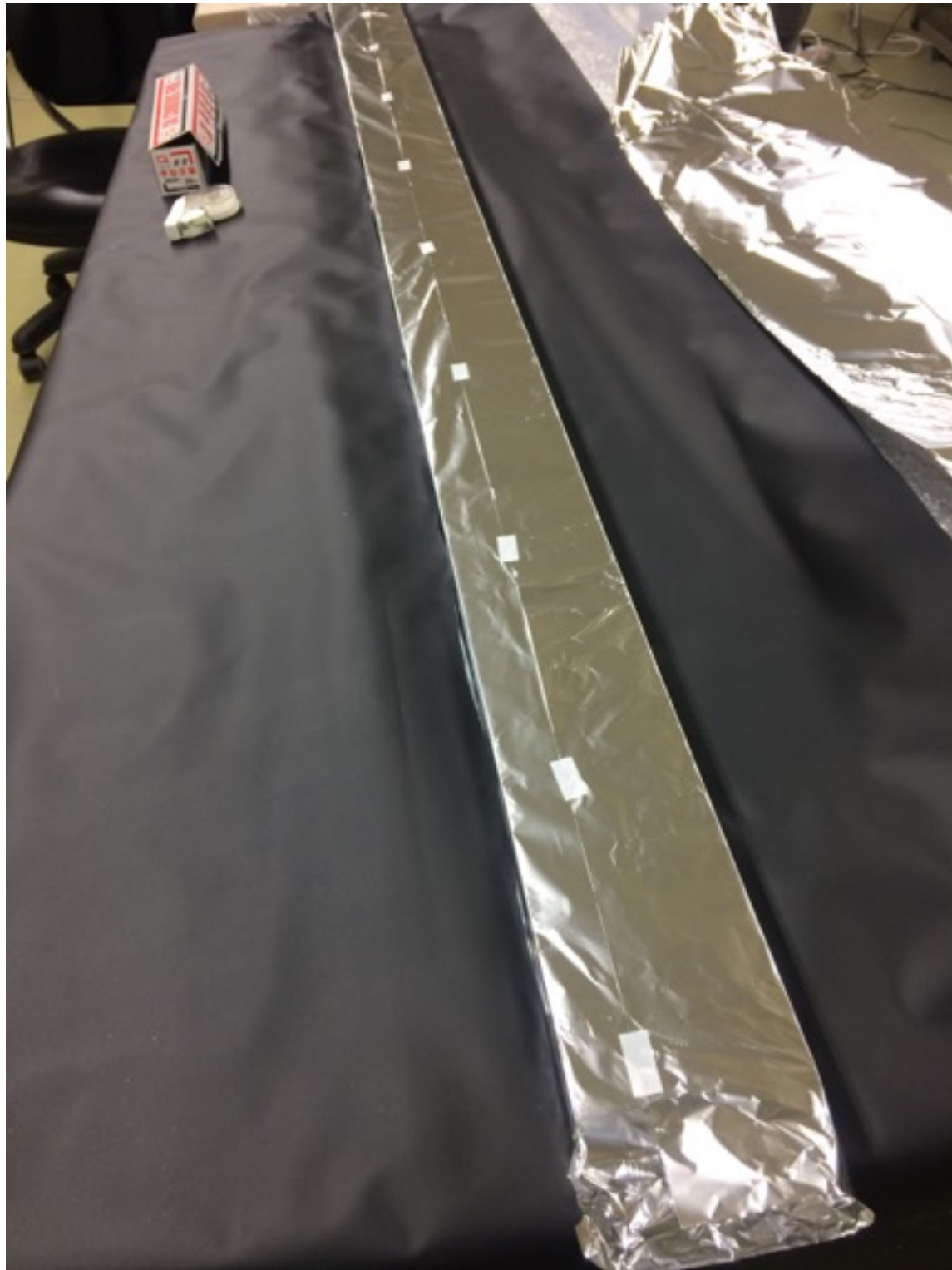
Plastic Scintillator from IBS



Polishing



Shielding & Wrapping

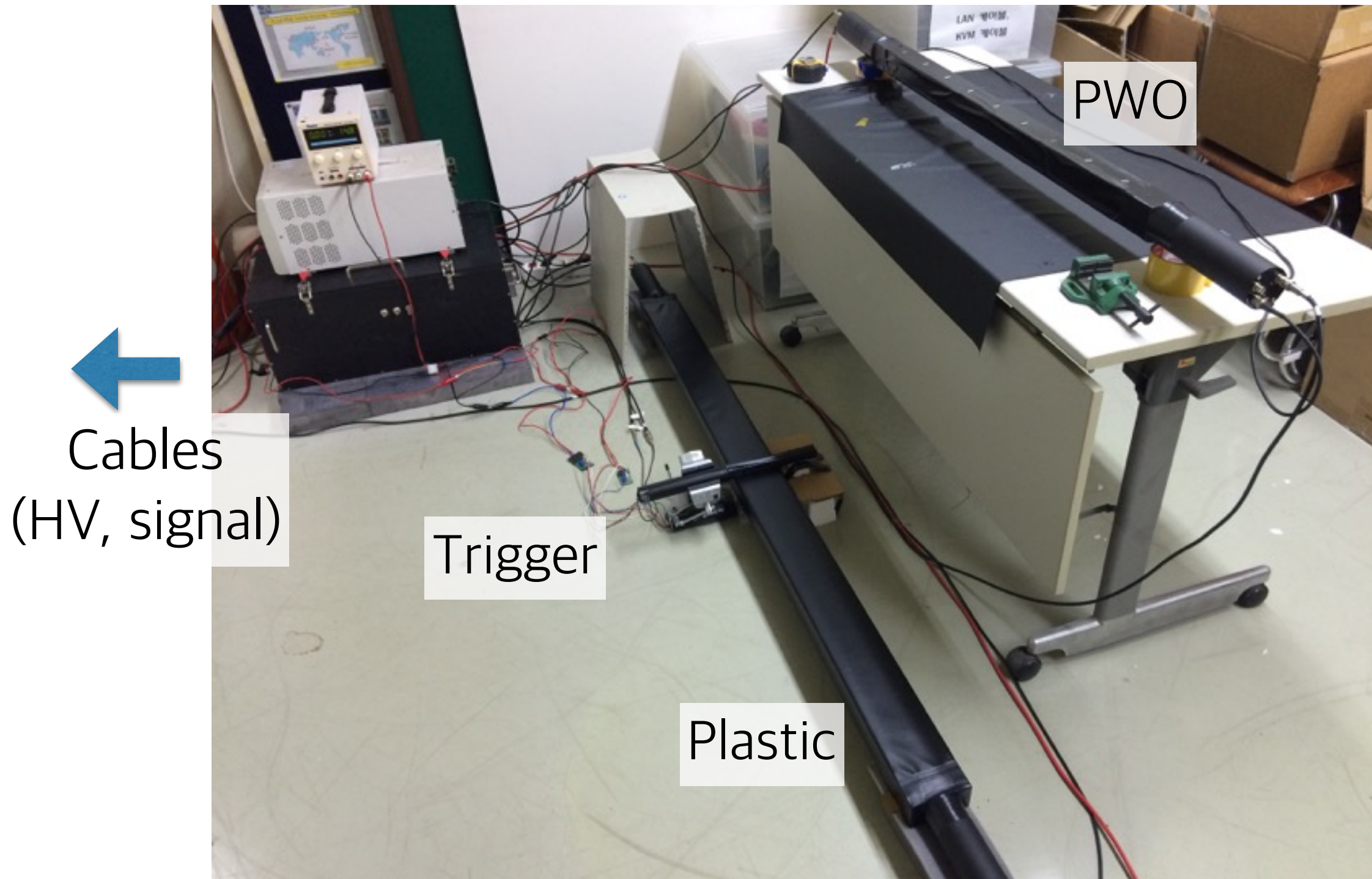


Shielding & Attaching PMT



- Al foil (two layers)
No foil on both edges
- Black sheet and tape
- PMT (H7195, 6cm in diameter)
- Check light leakage

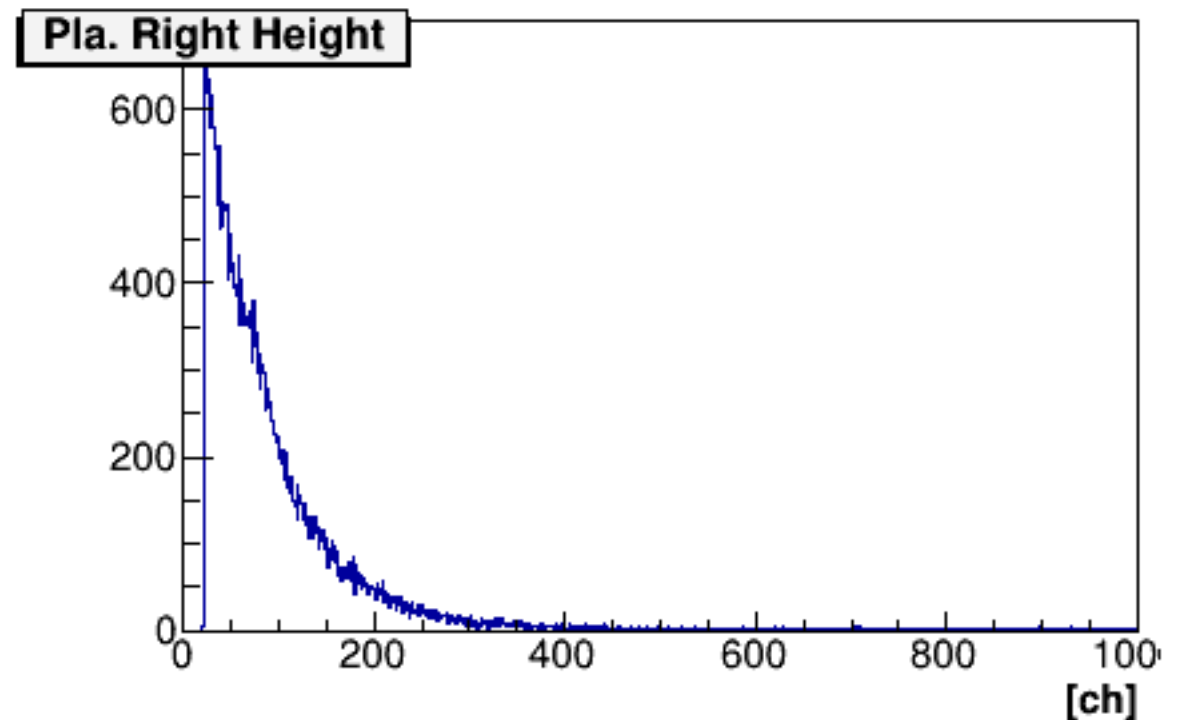
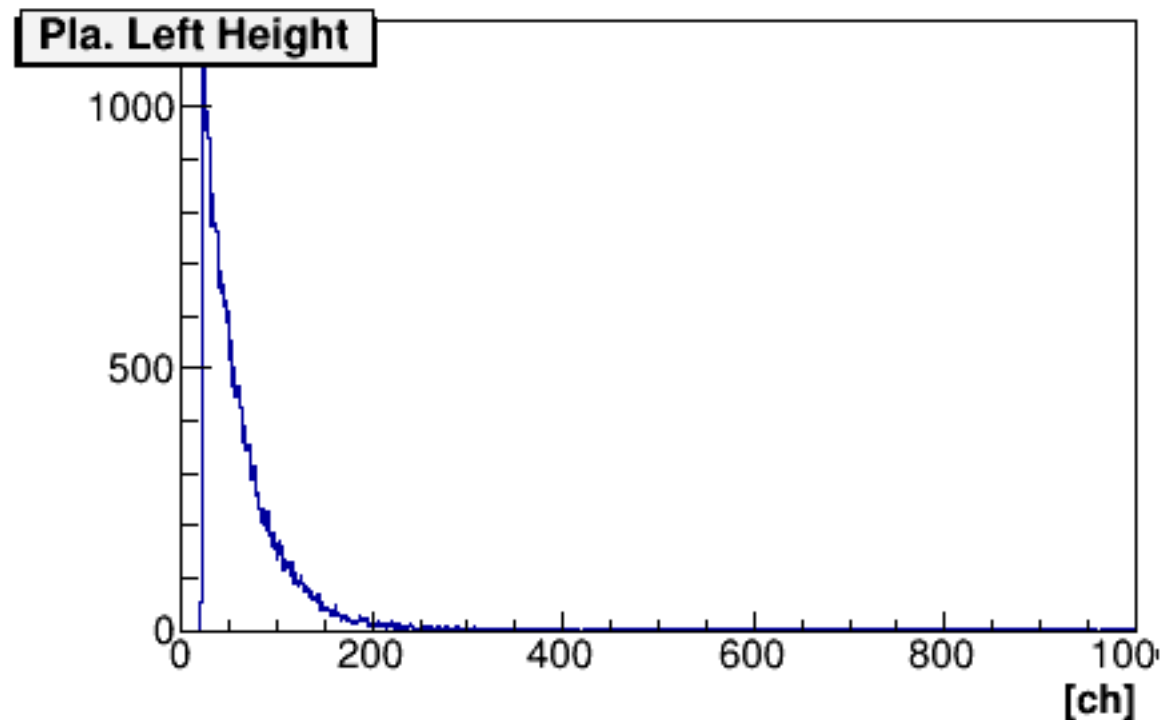
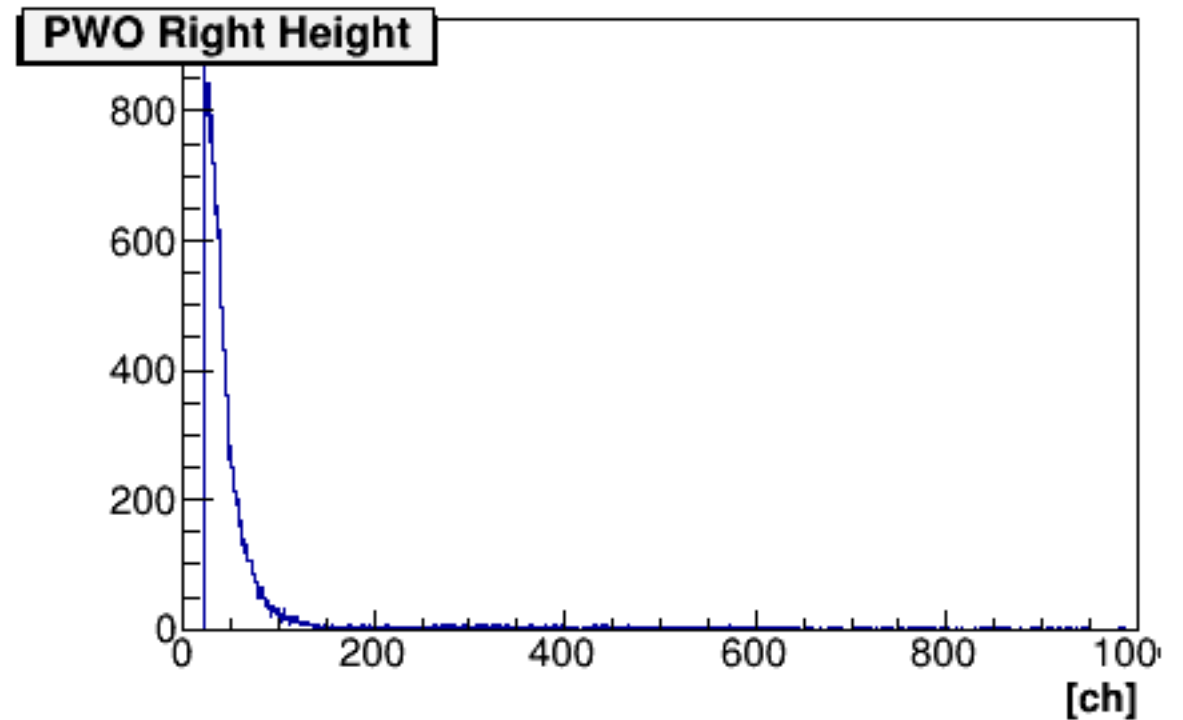
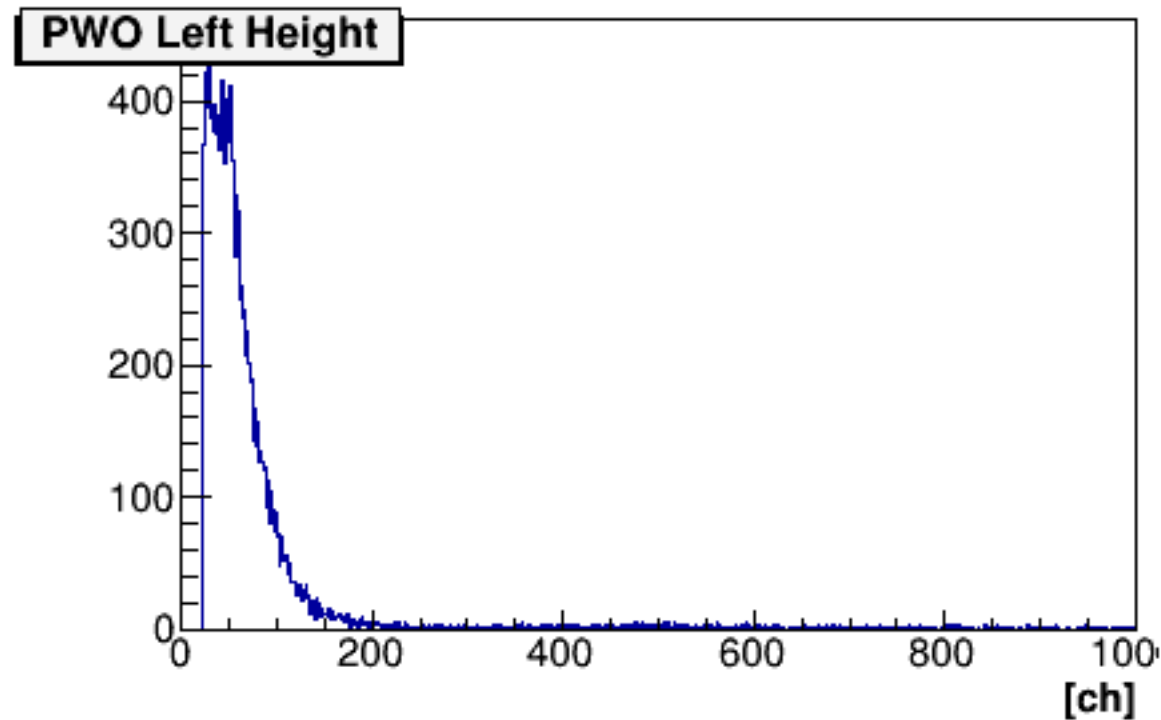
Experimental setting with plastic scintillator



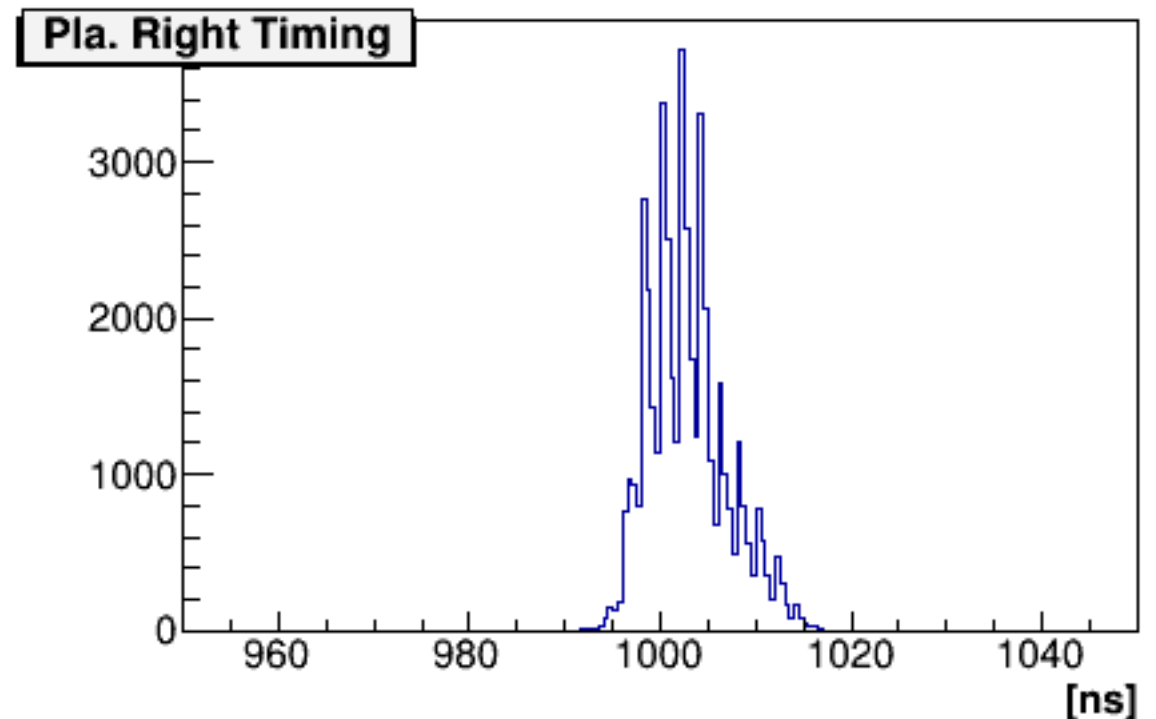
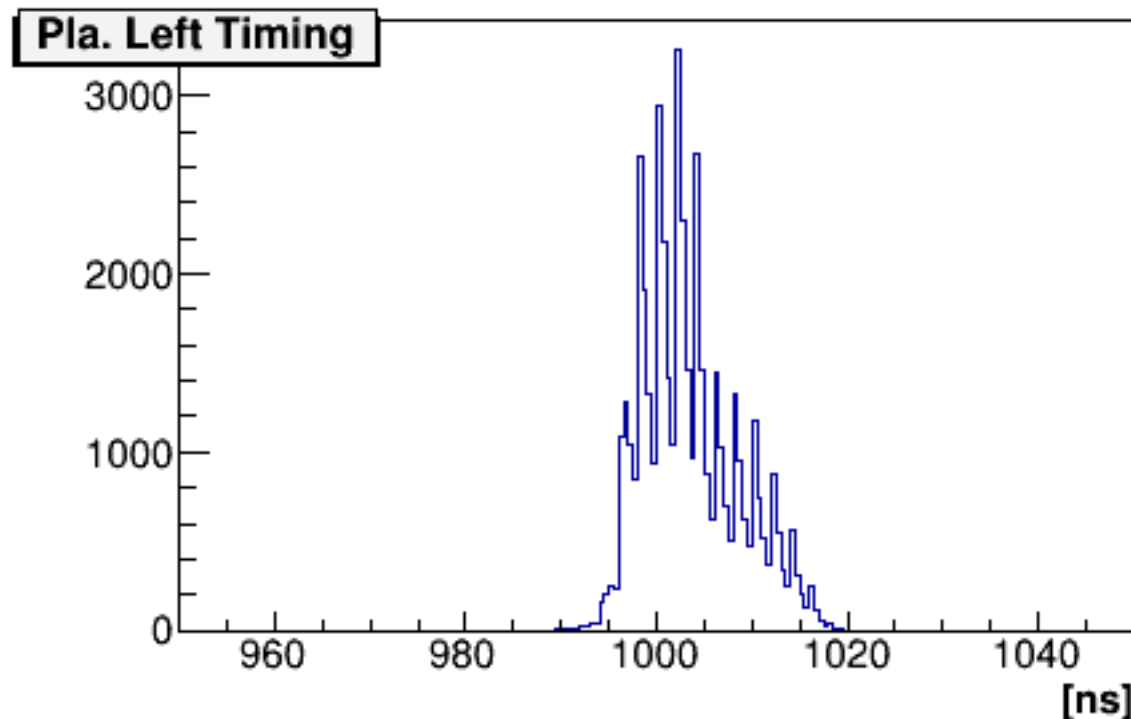
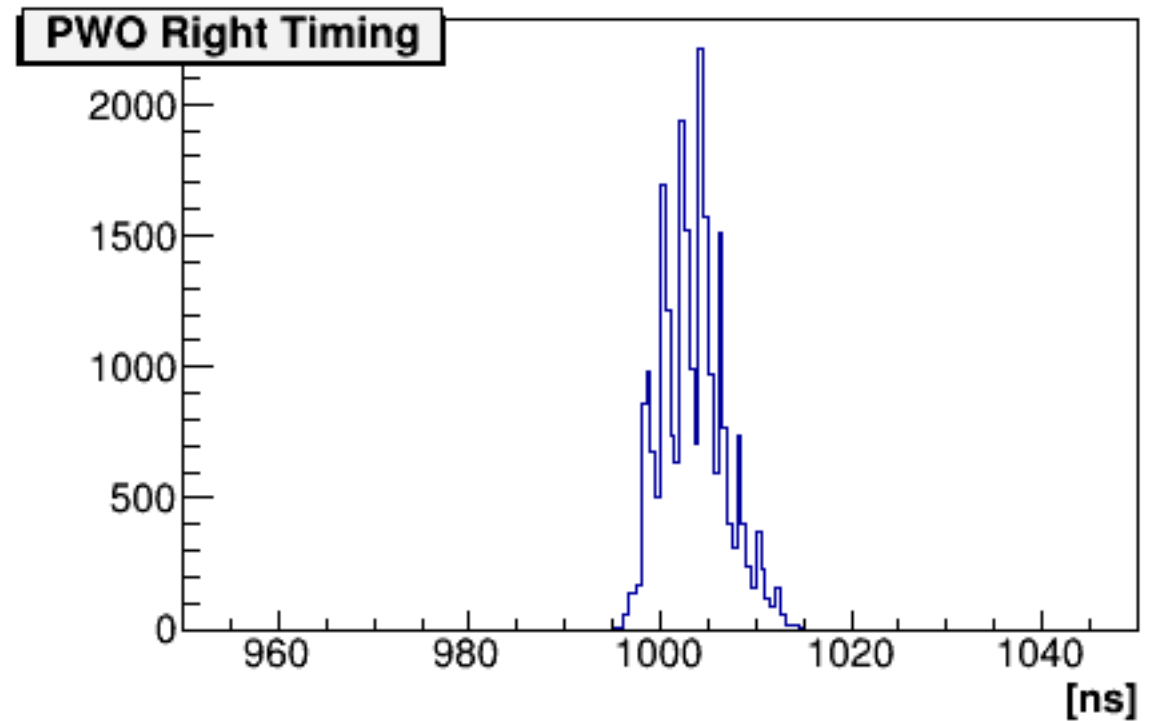
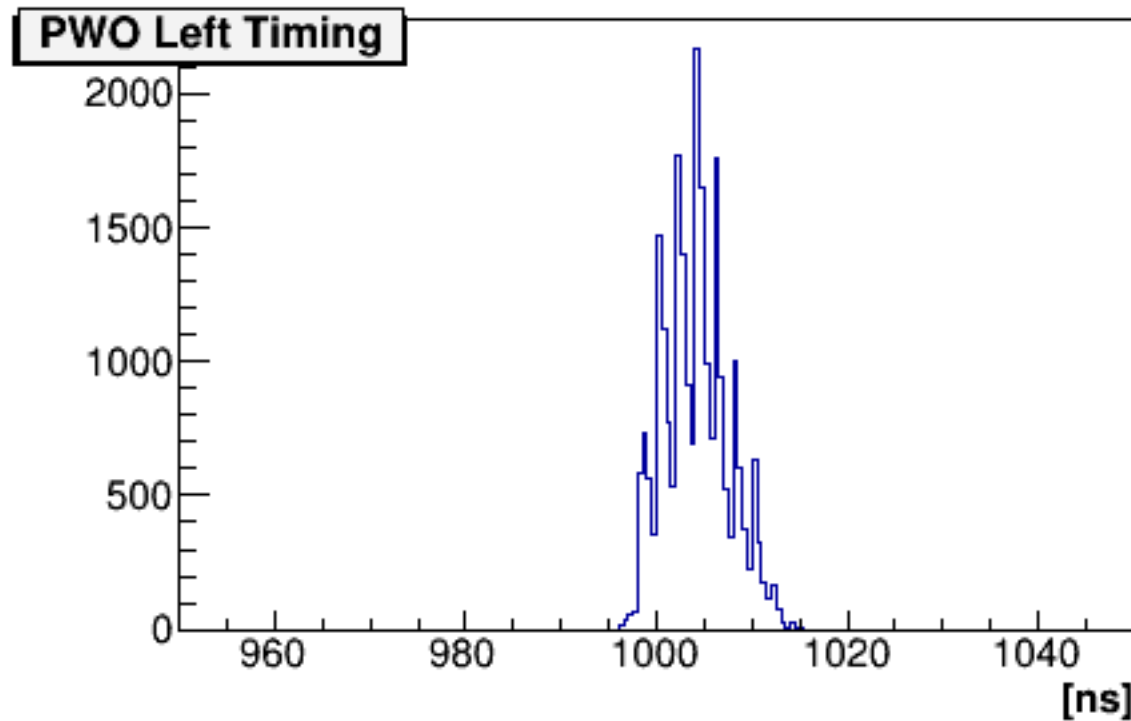
Data taking (bar only)

- Take cosmic-ray data
only with signals from the plastic scintillation bar
(Left, Right PMT: 2 chs.)
- 20 mV-threshold for both channels in coincidence
- about 2 hrs (~ 45,000 events)

PWO vs Pla. (Sig. height)

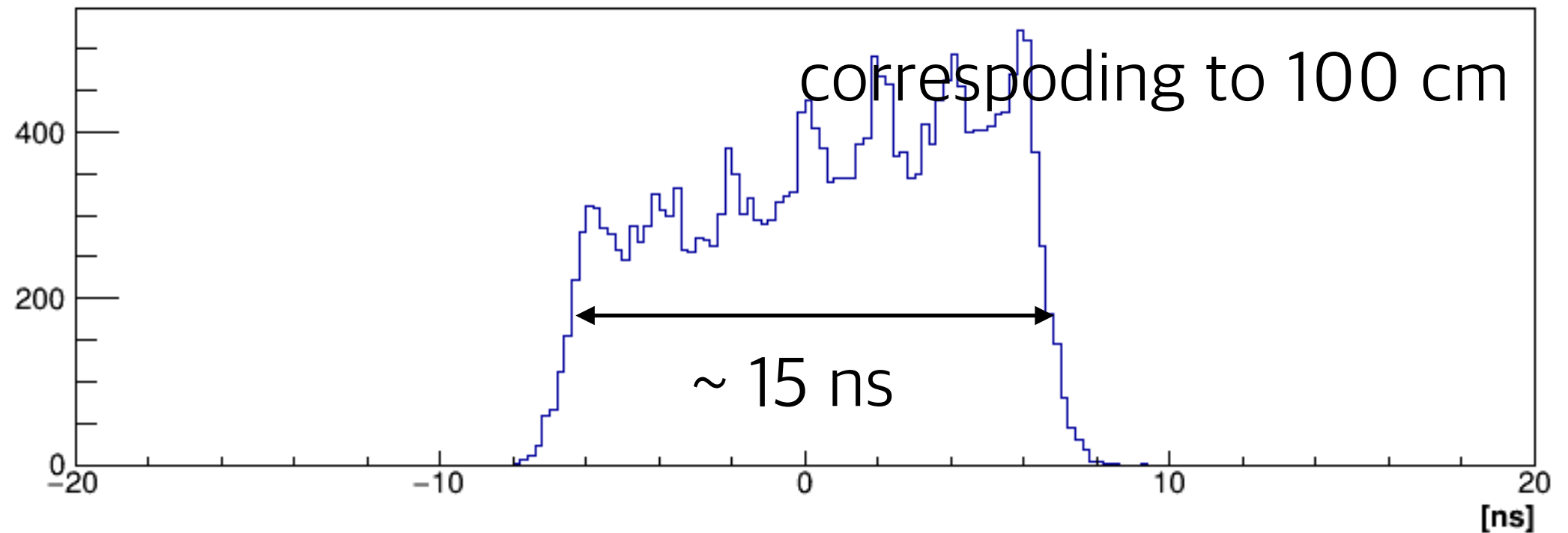


PWO vs Pla. (Sig. timing)

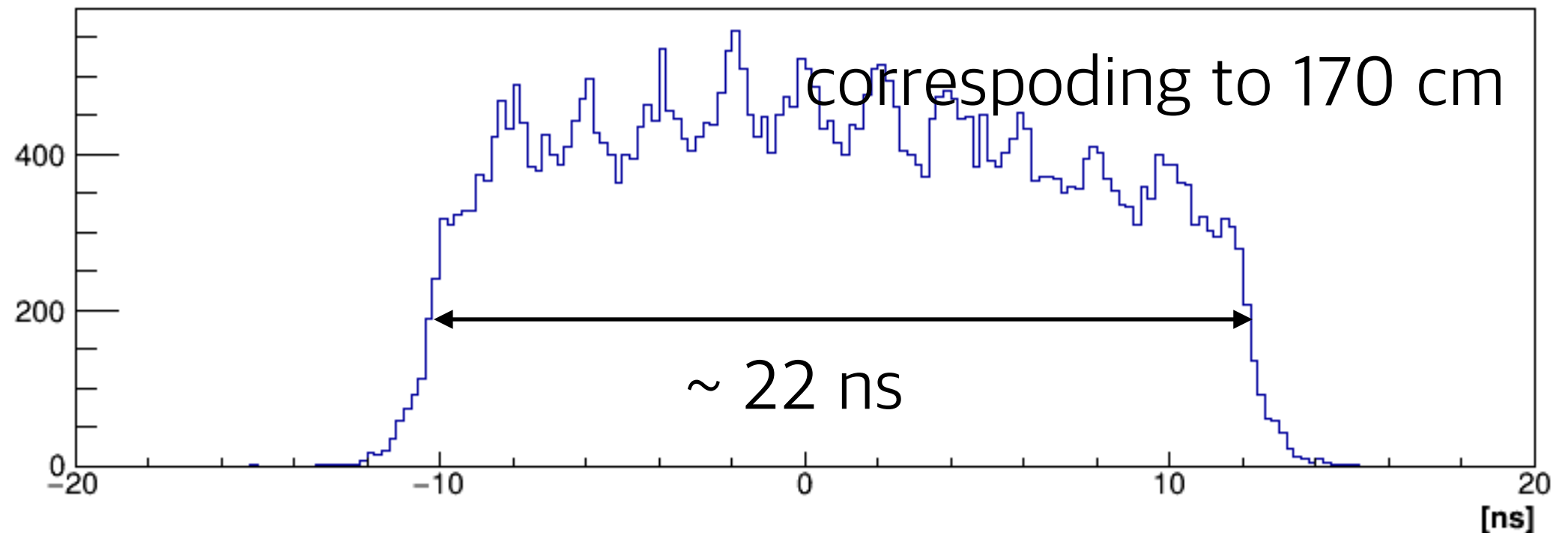


PWO vs Pla. (ΔT)

PWO dT



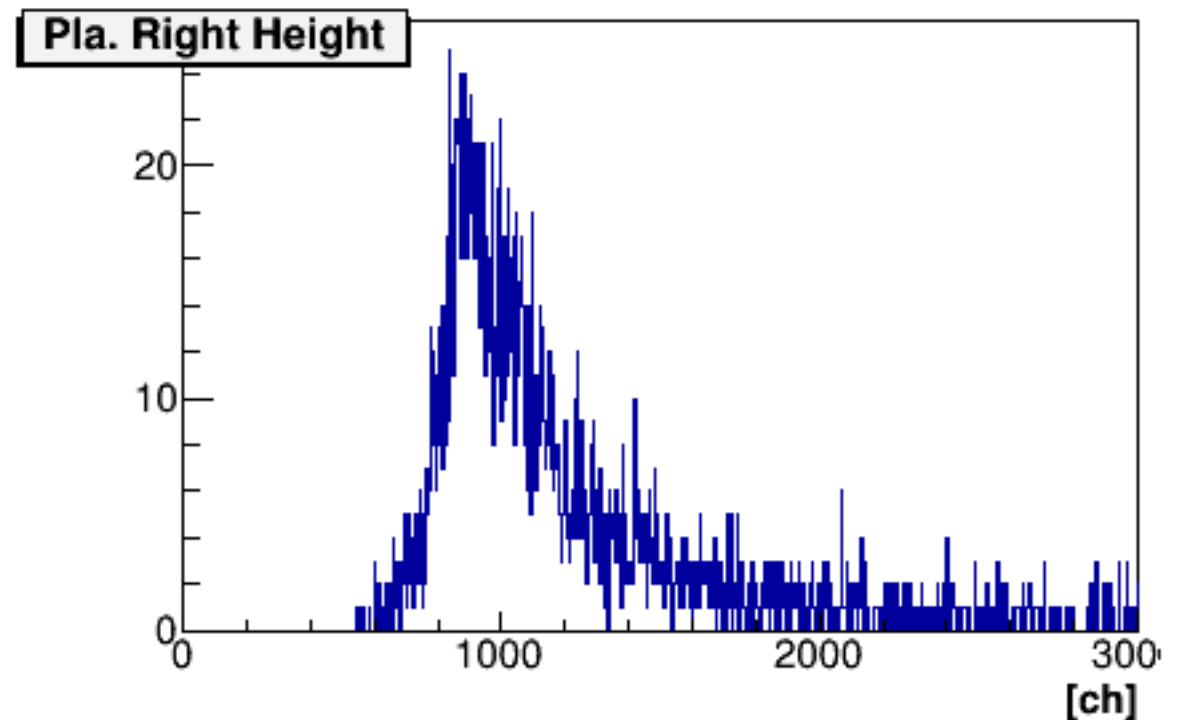
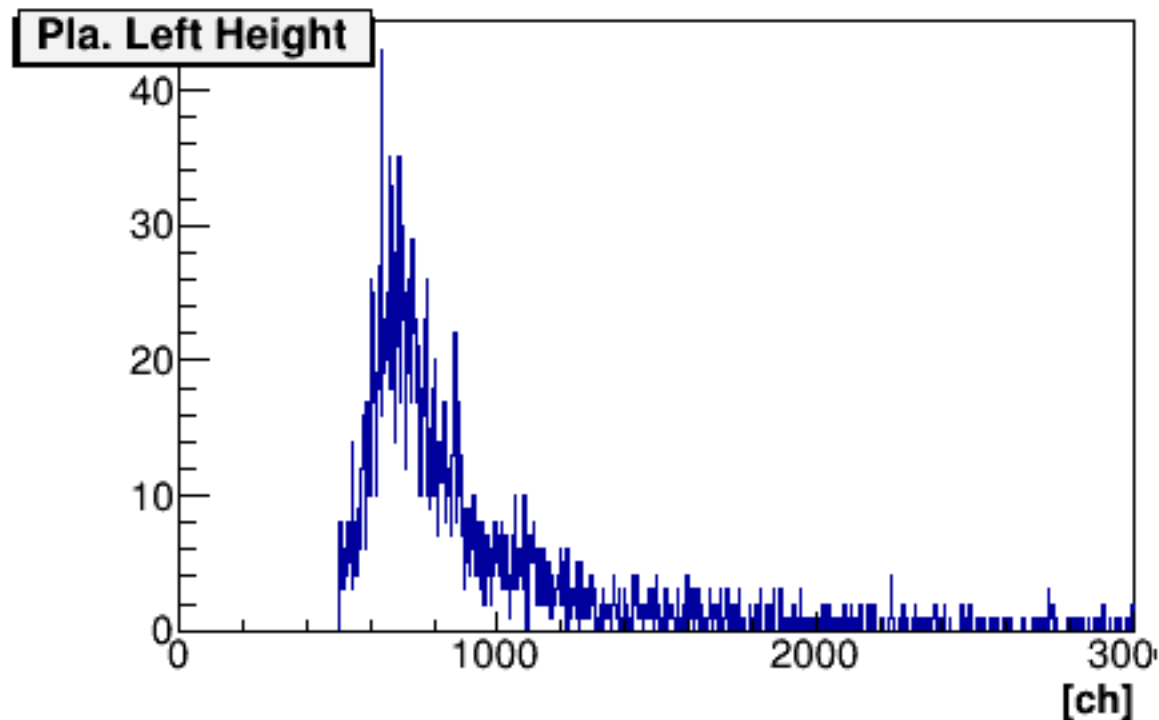
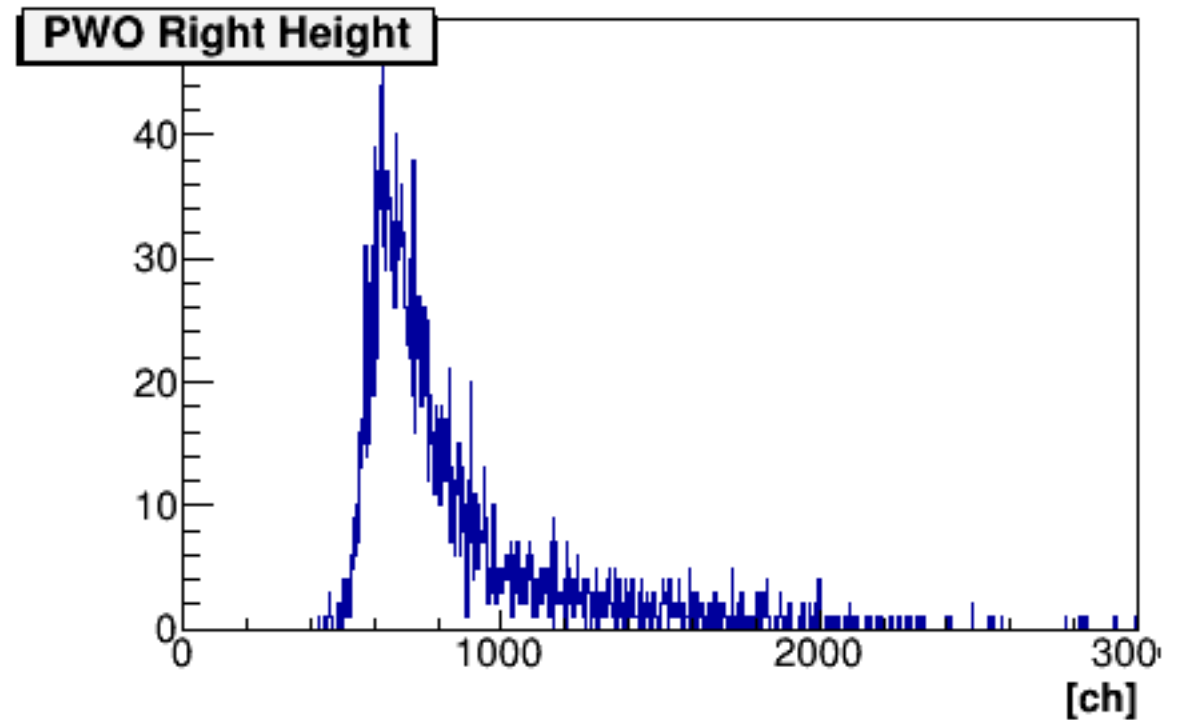
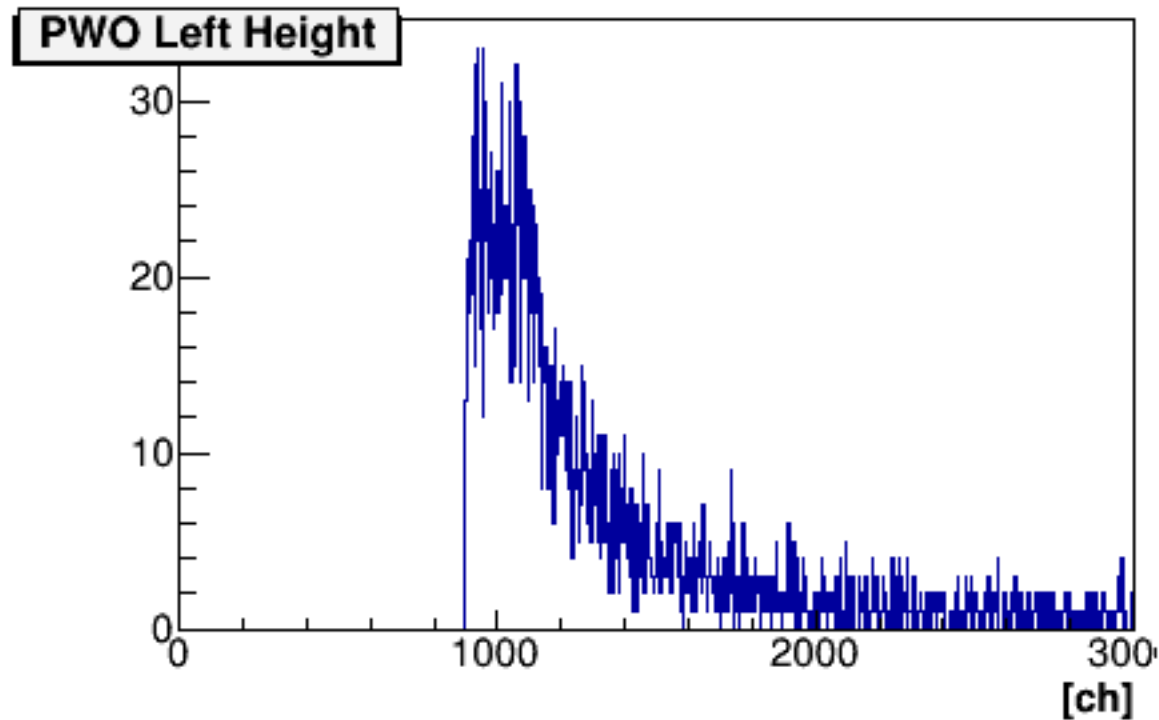
Pla dT



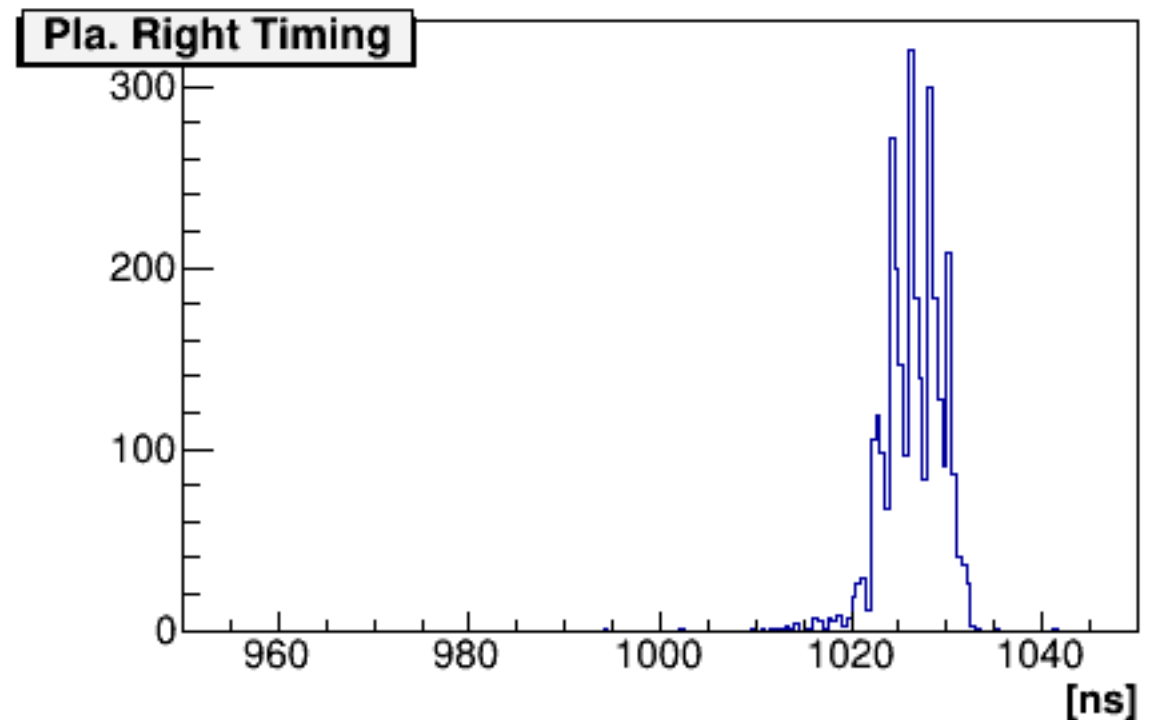
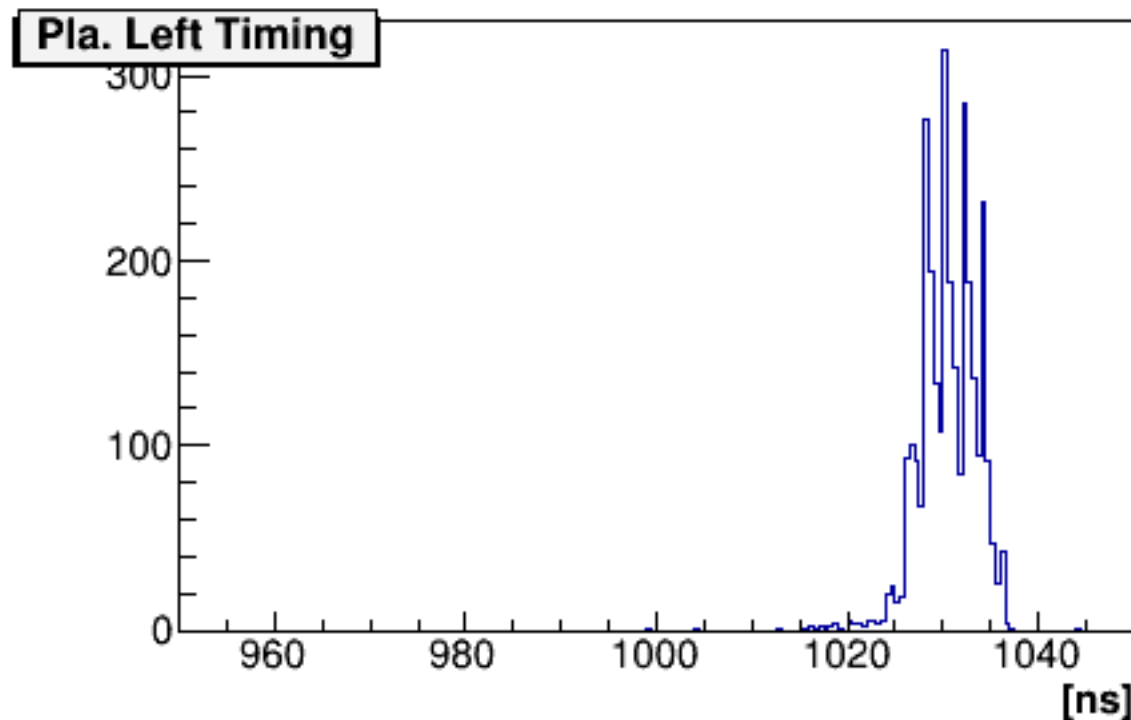
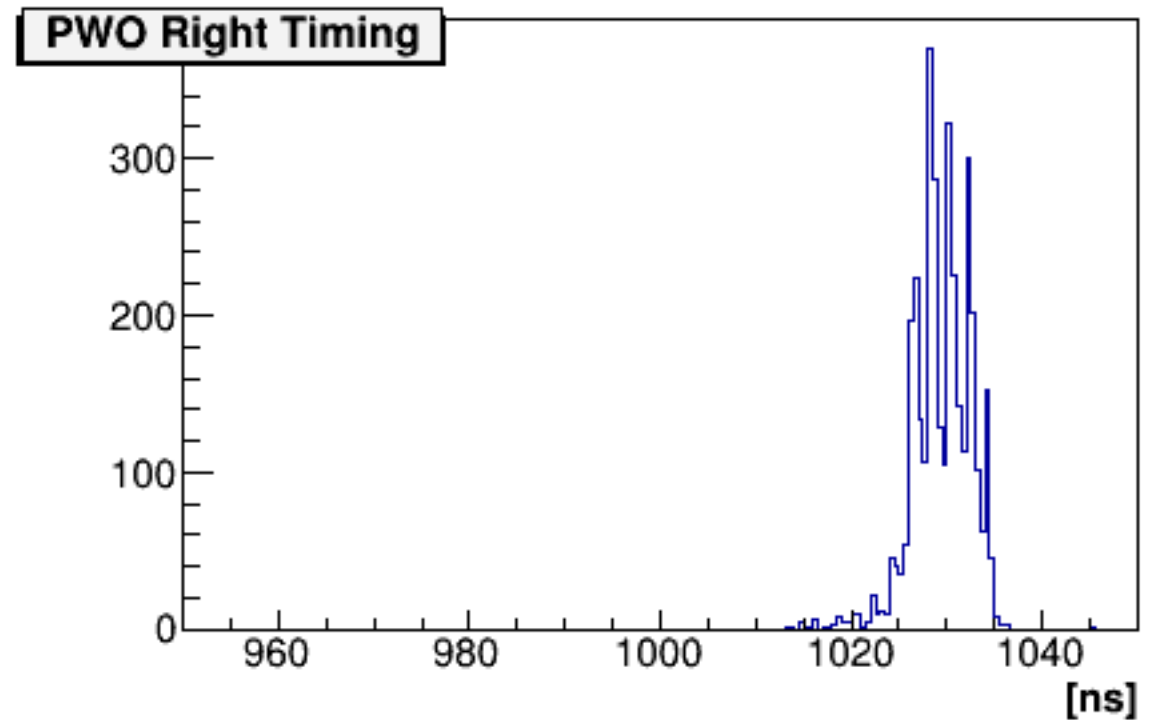
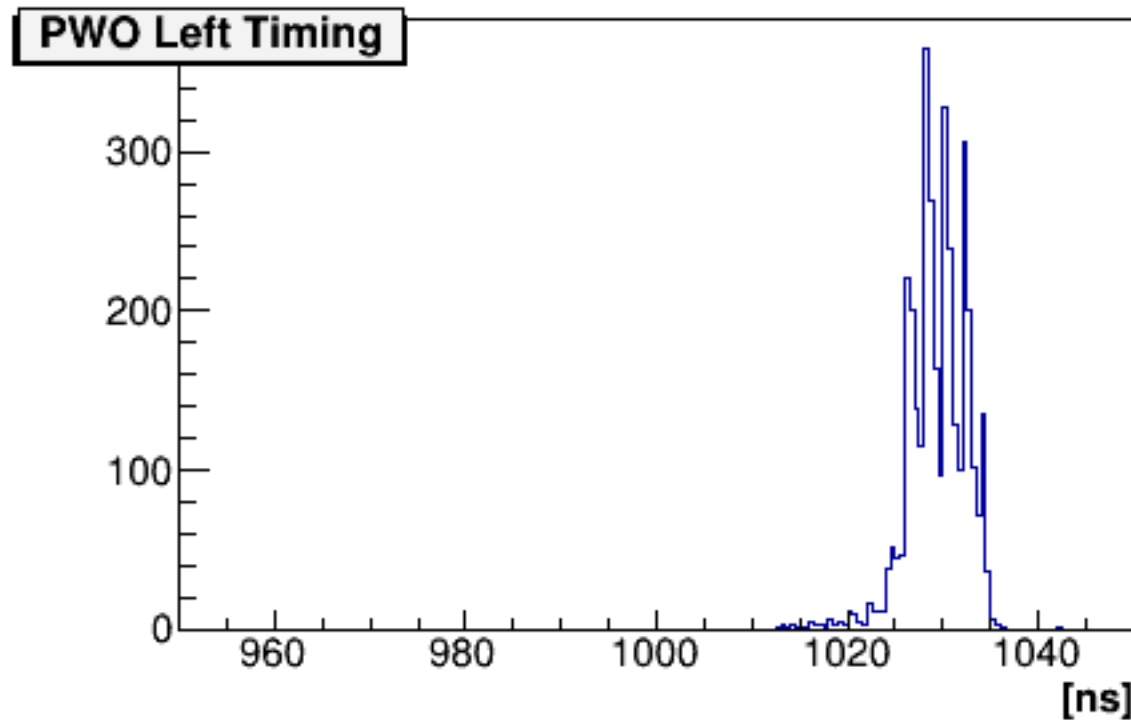
Data taking (bar & trig.)

- Take cosmic-ray data **with trigger counters and the plastic scintillation bar**
(Left, Right PMT, Up, Down PMT: 4 chs.)
- Trigger counter locates at the center of the bar.
- 20 mV-threshold for both channels in coincidence
- about 20 hrs (~ 4,000 events)

PWO vs Pla. (Sig. height)

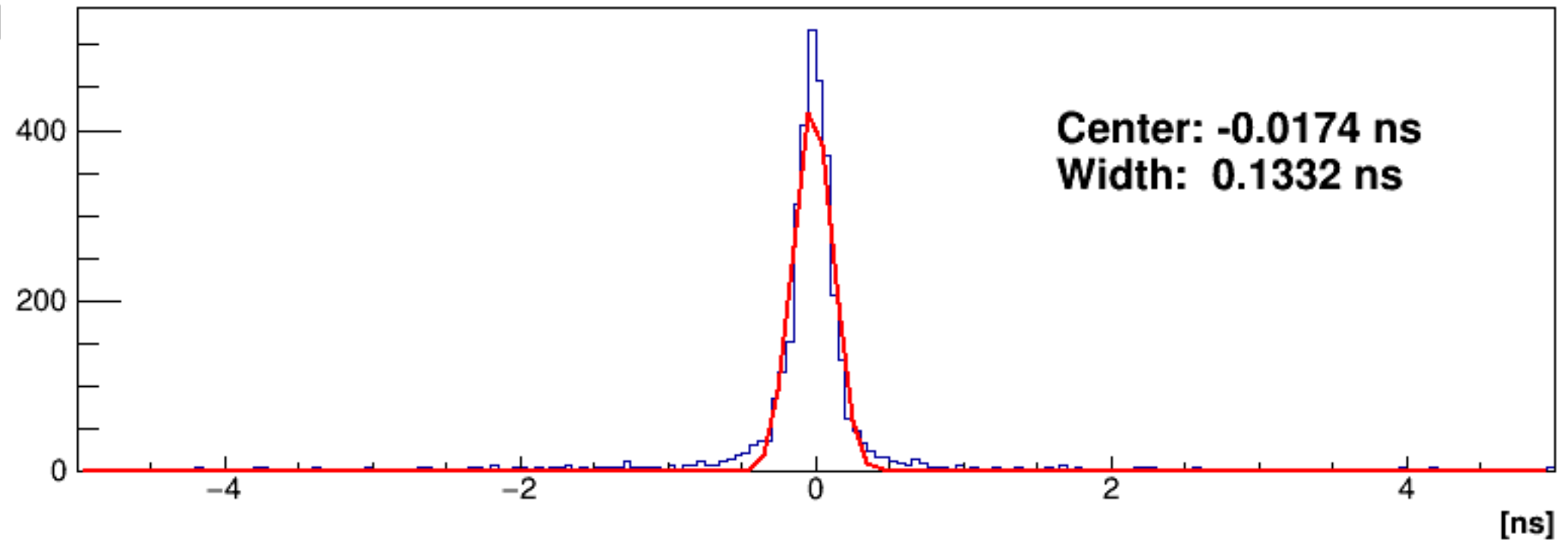


PWO vs Pla. (Sig. timing)

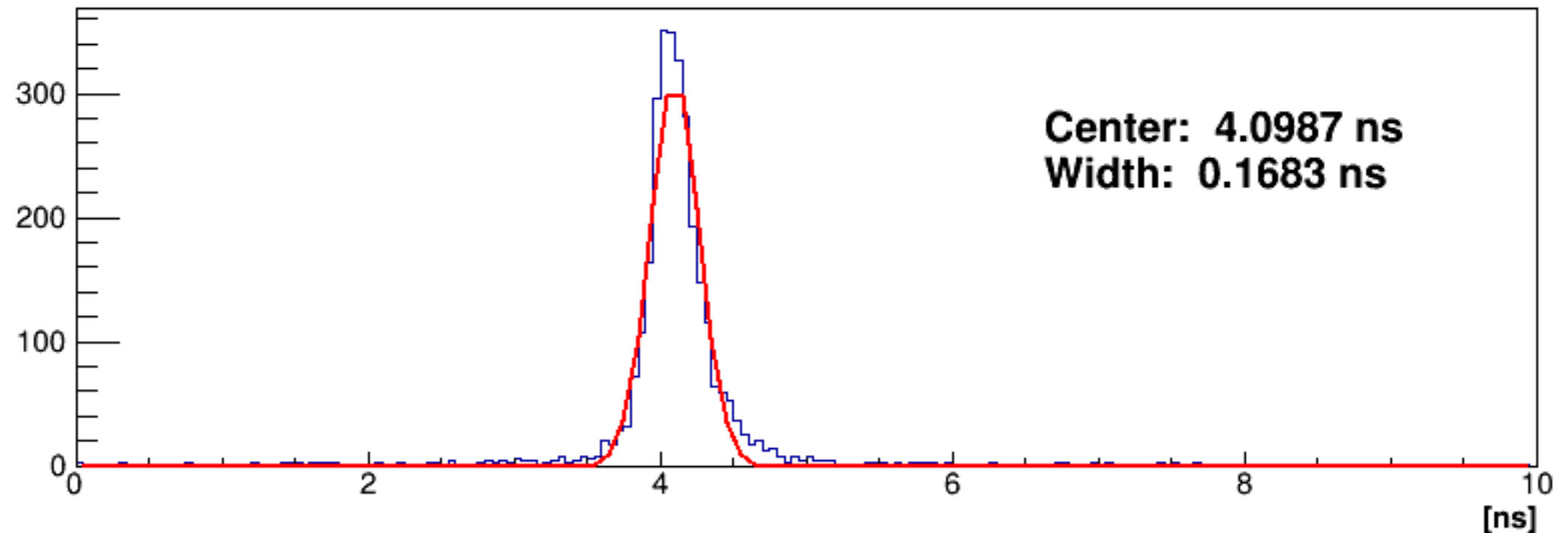


PWO vs Pla. (ΔT)

PWO dT



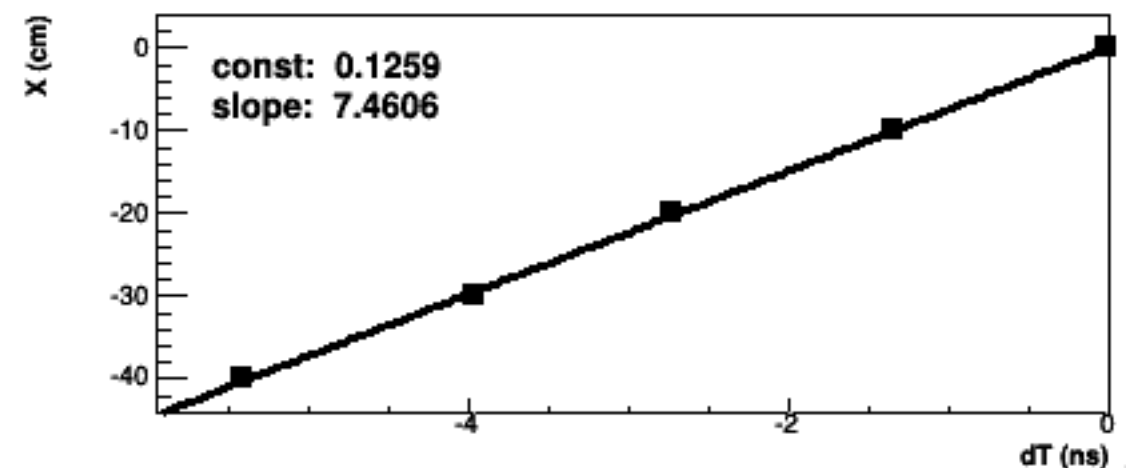
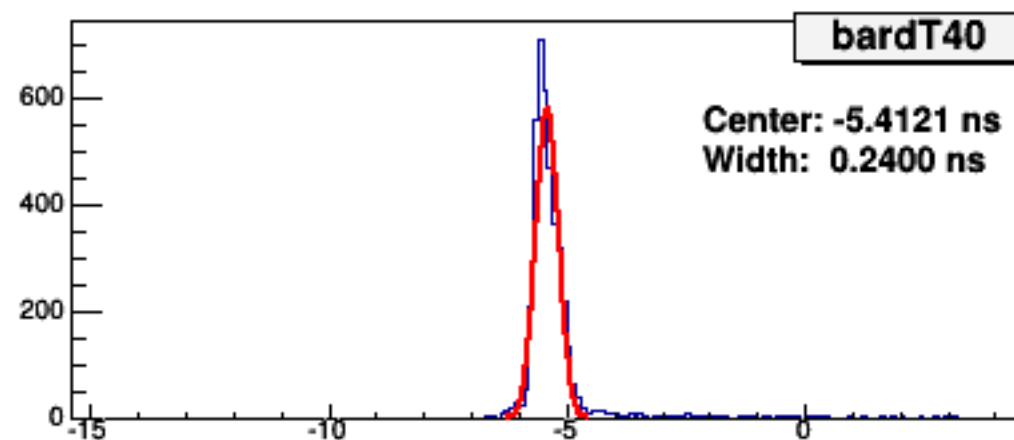
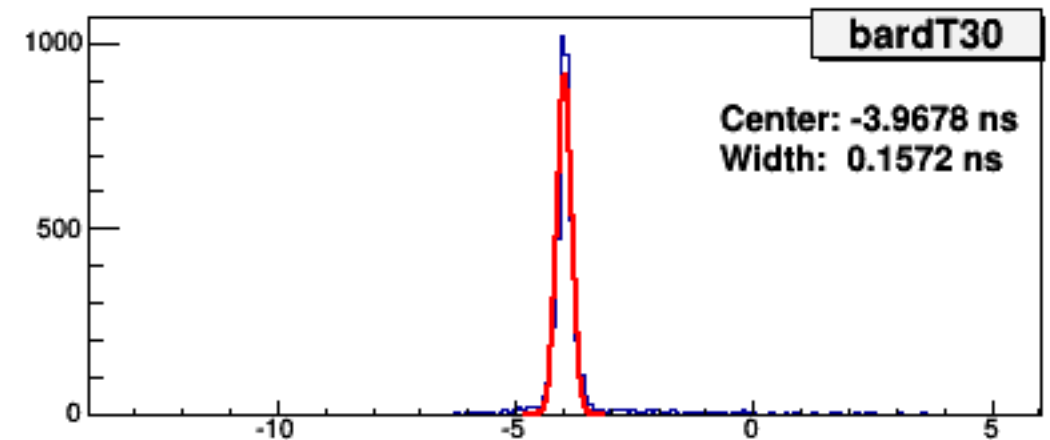
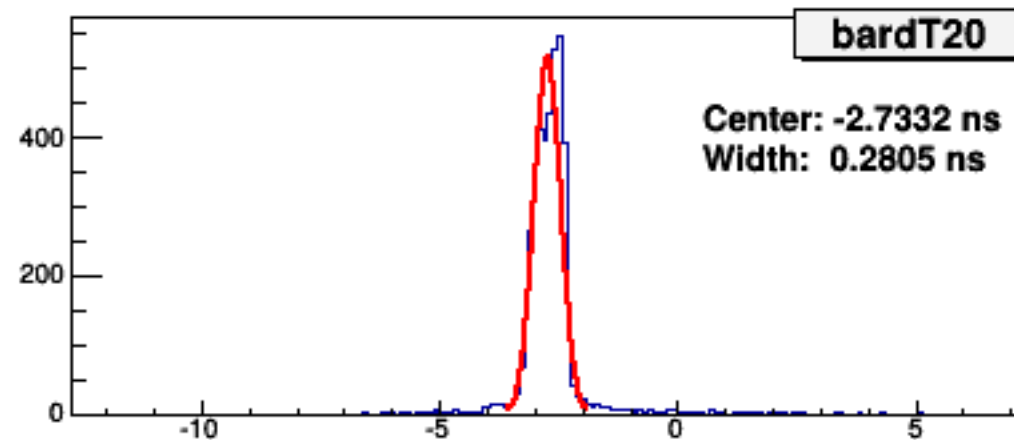
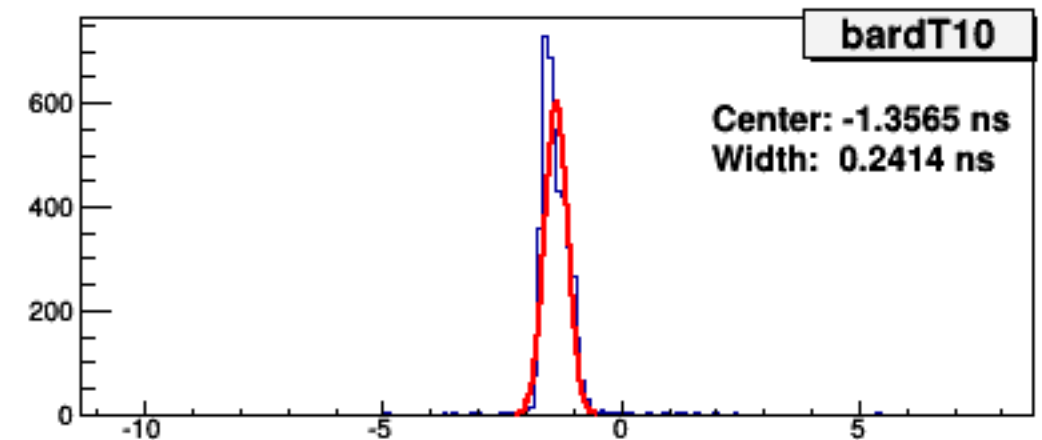
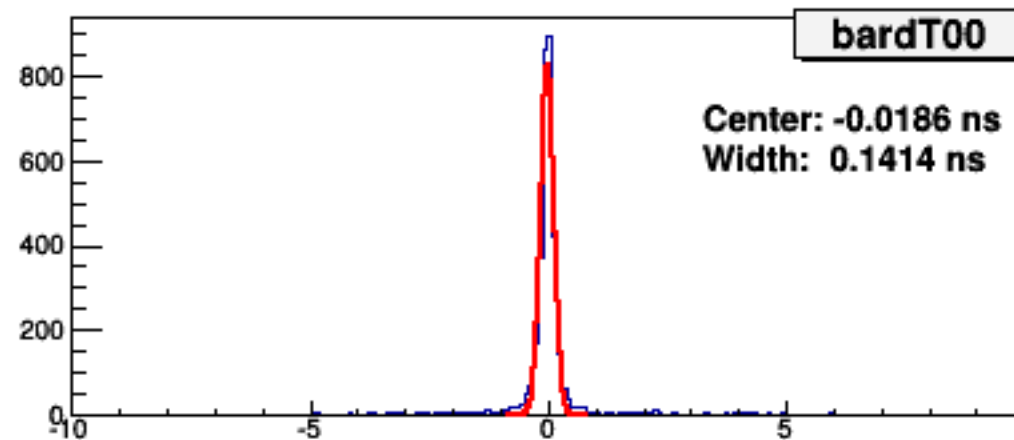
Pla dT



To-do

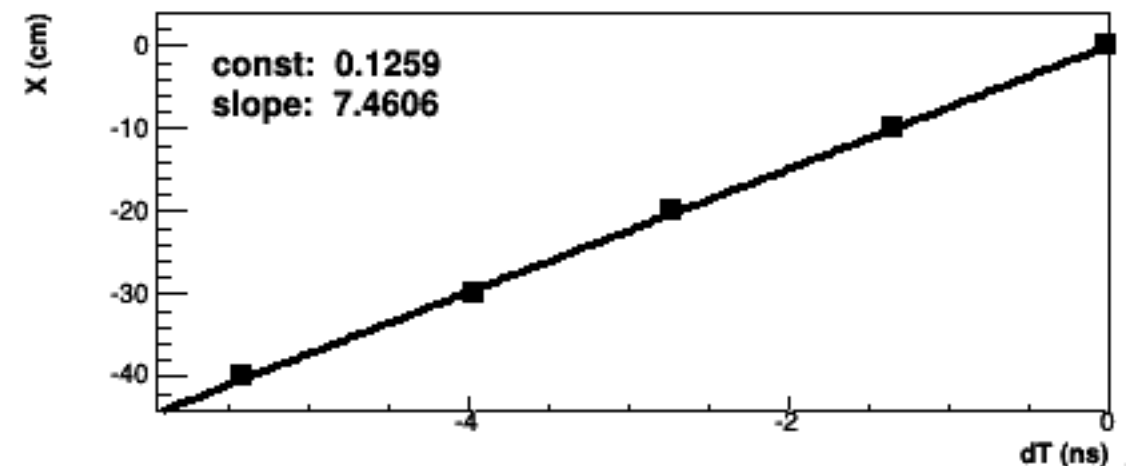
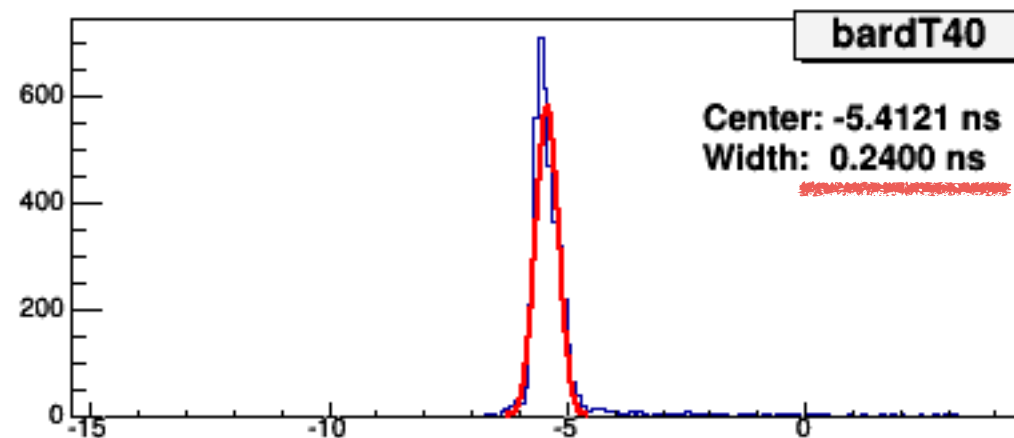
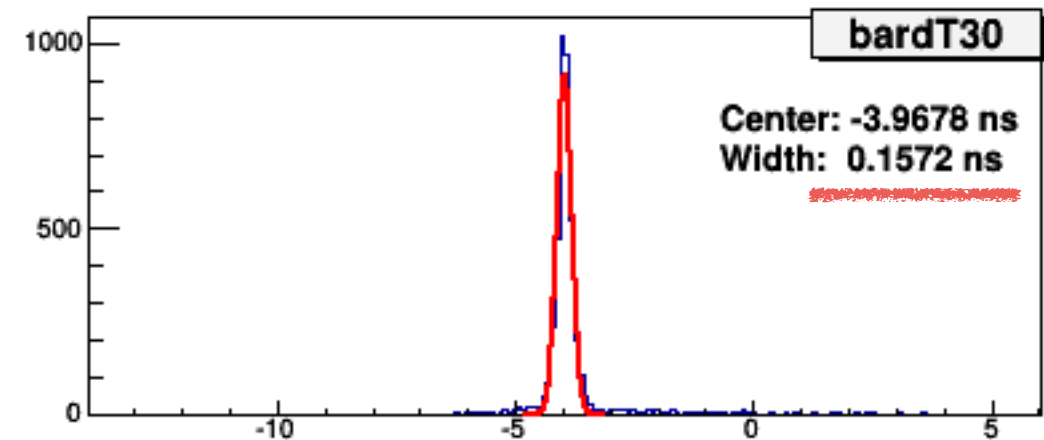
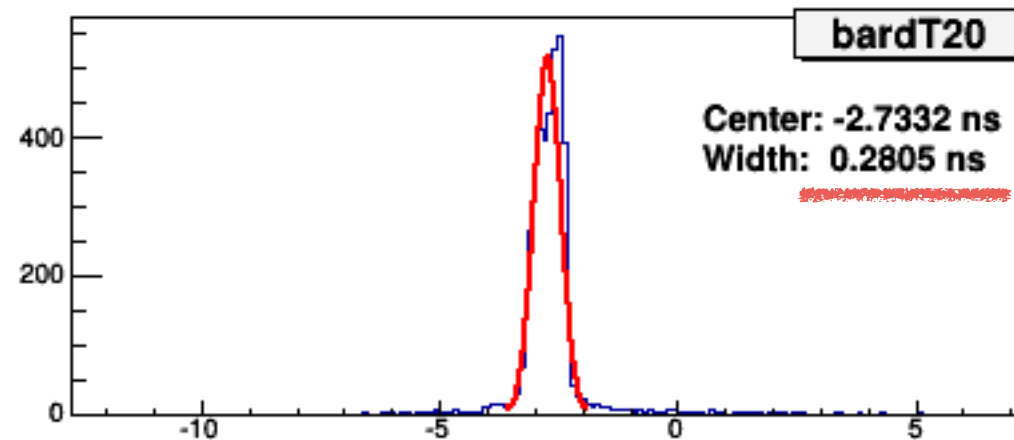
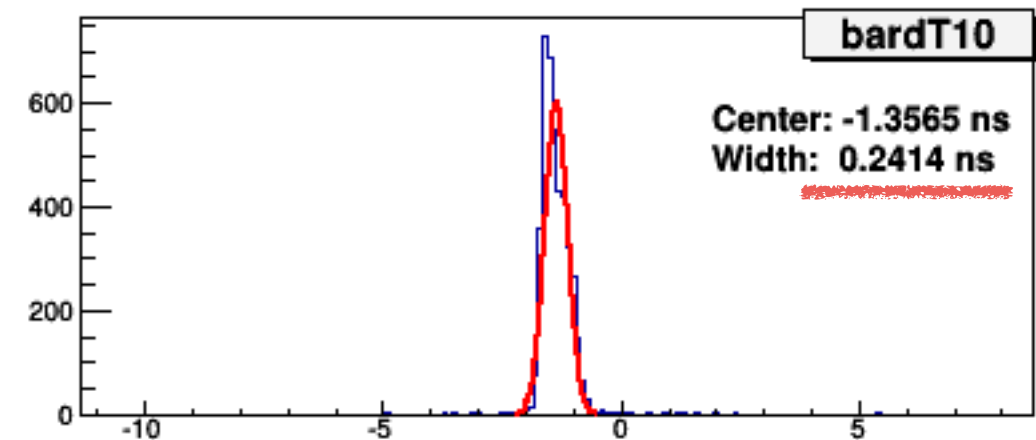
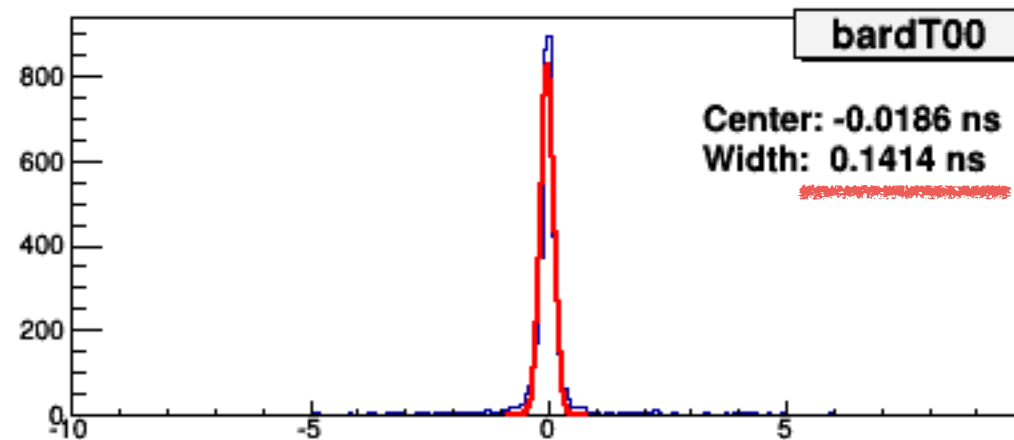
- Shielding & Wrapping another bar
- Plastic & PWO scint. test
- GEANT4 simulation

ΔT – Position relation



$$x = 7.4606 \times \Delta T_{LR} [\text{ns}] + 0.1260 [\text{cm}]$$

Time (ΔT) resolution?



Some are small, the others are large (about twice).