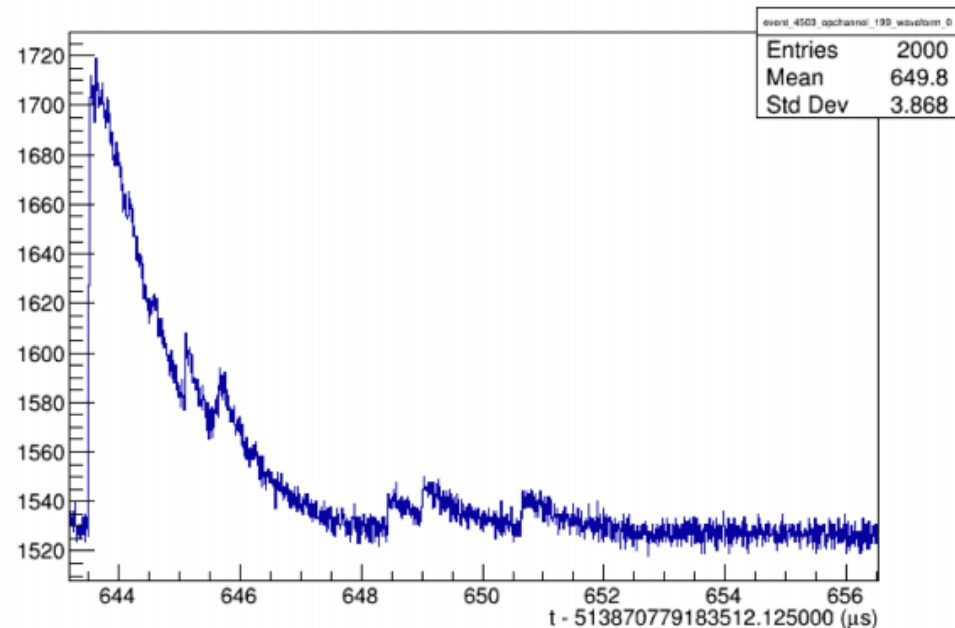
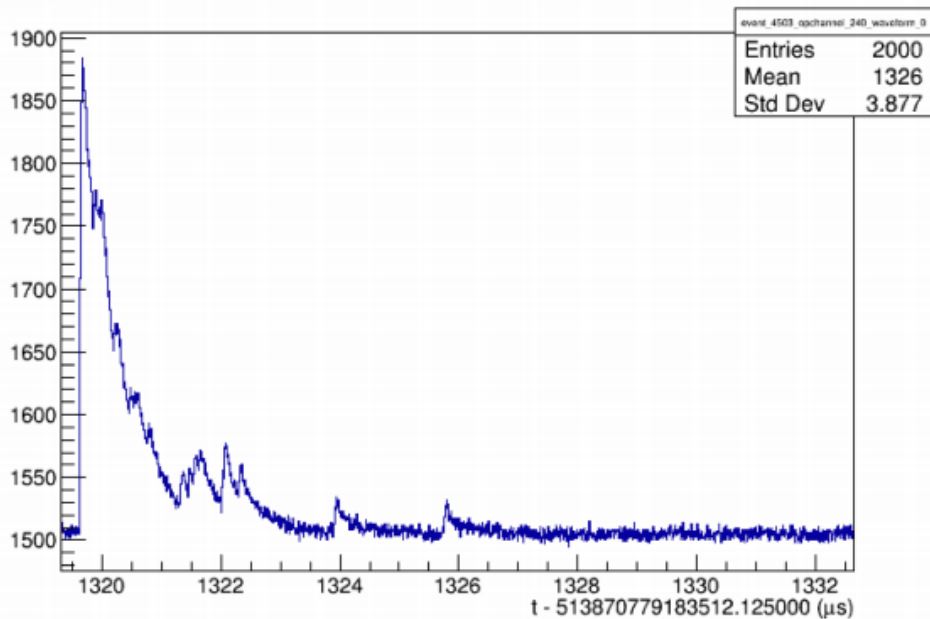


Changes to Optical Reconstruction

Kyle Spurgeon
Syracuse University

Hit Finding in Practice



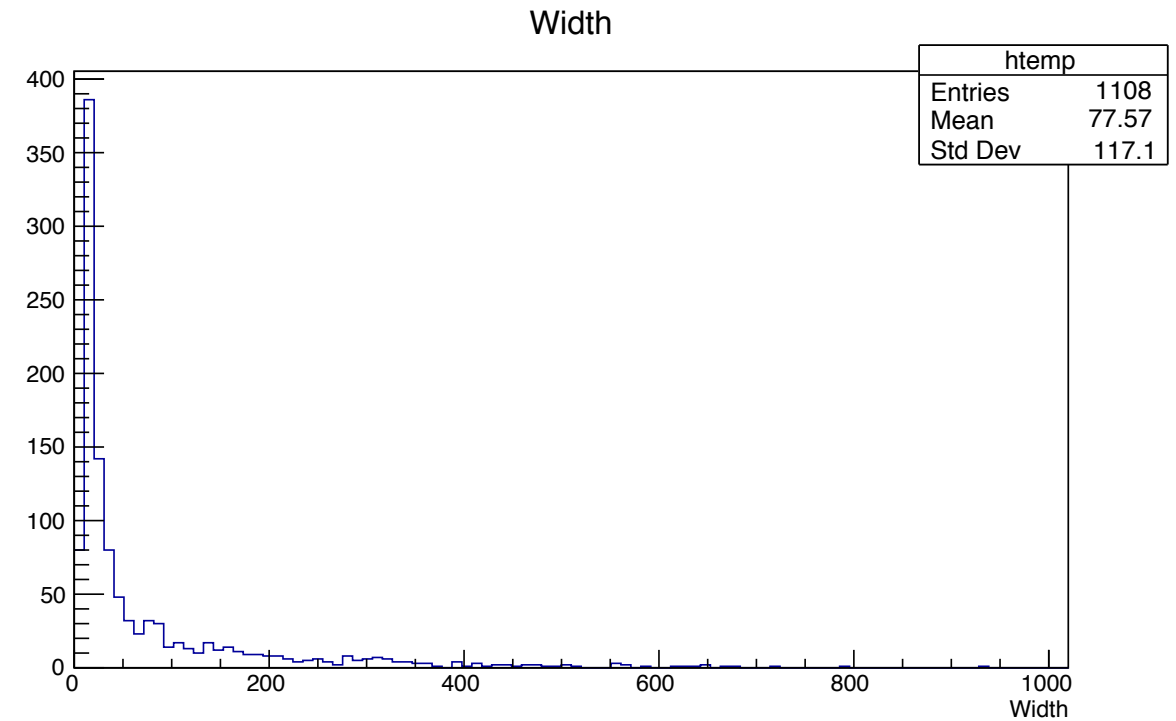
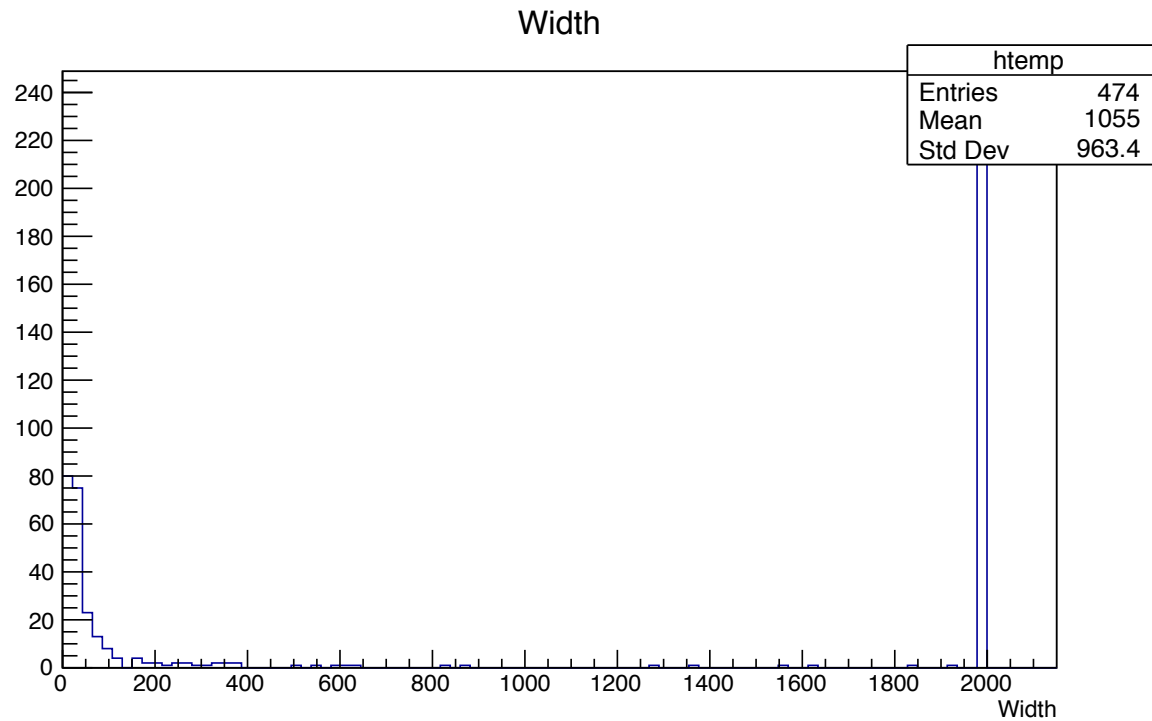
- Should have:
 - 1 hit $\sim 4 \mu\text{s}$ wide with amplitude ~ 350 ADC and 2 smaller hits
- What we get:
 - We do see 1 hit $4 \mu\text{s}$ wide with amplitude 14 and 2 smaller hits
 - Also have 22 *other* hits with tiny widths and fractional PE integrals.

- Should have:
 - 1 hit $\sim 4 \mu\text{s}$ wide with amplitude ~ 350 ADC and integral $\sim 65\text{k}$ ADC
- What we get:
 - 1 hit $13 \mu\text{s}$ wide with amplitude 32 and integral $\sim 100\text{k}$ ADC
- It also looks like every hit in the event gets exactly the same time?
 - I think this is an analyzer issue.

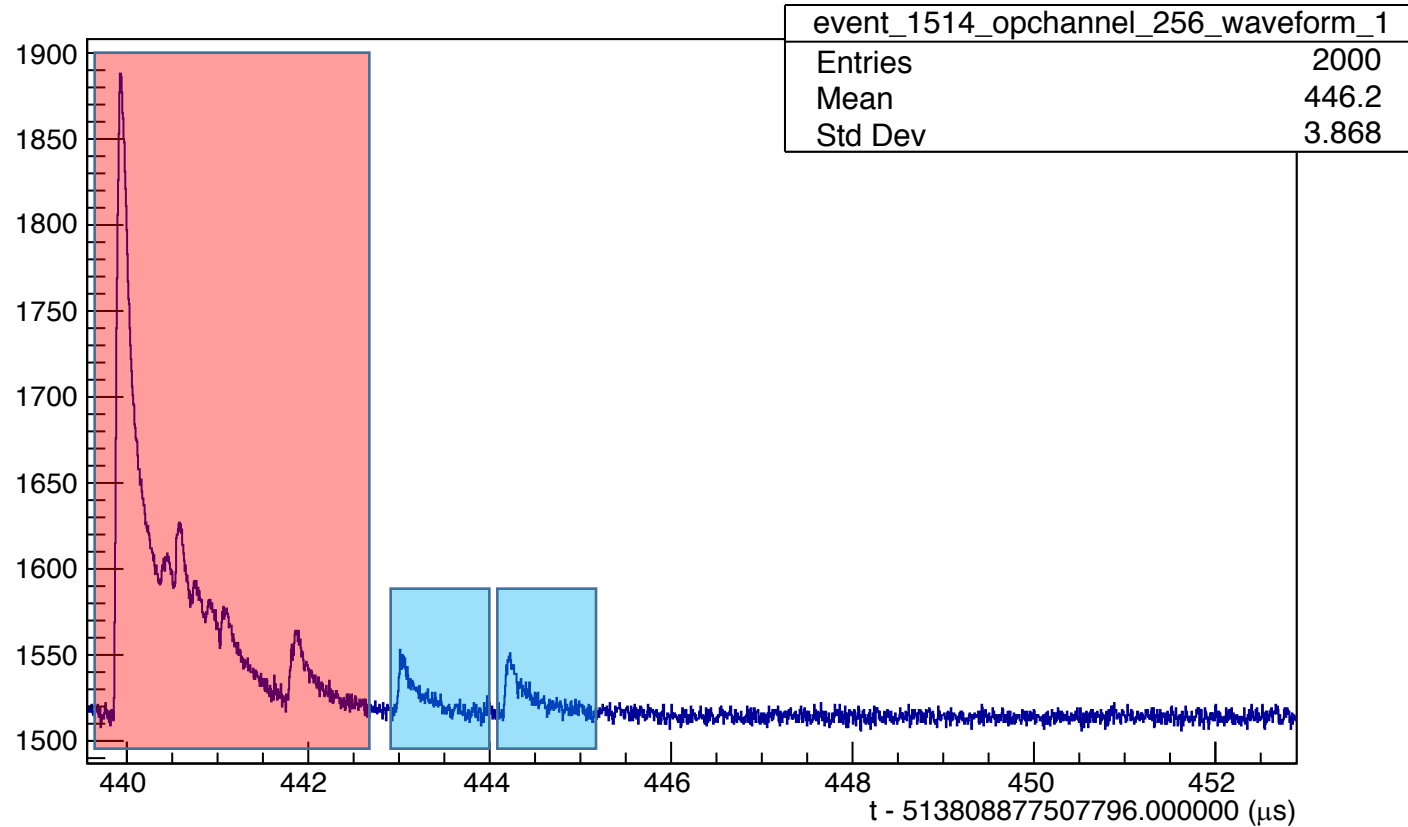
I think fixing this is quite urgent if we want to use reconstructed quantities.

Fixes

- First-
 - Incorporate the pedestal finder (that already exists) into AlgoSiPM
 - Copy implementation from other Algorithms



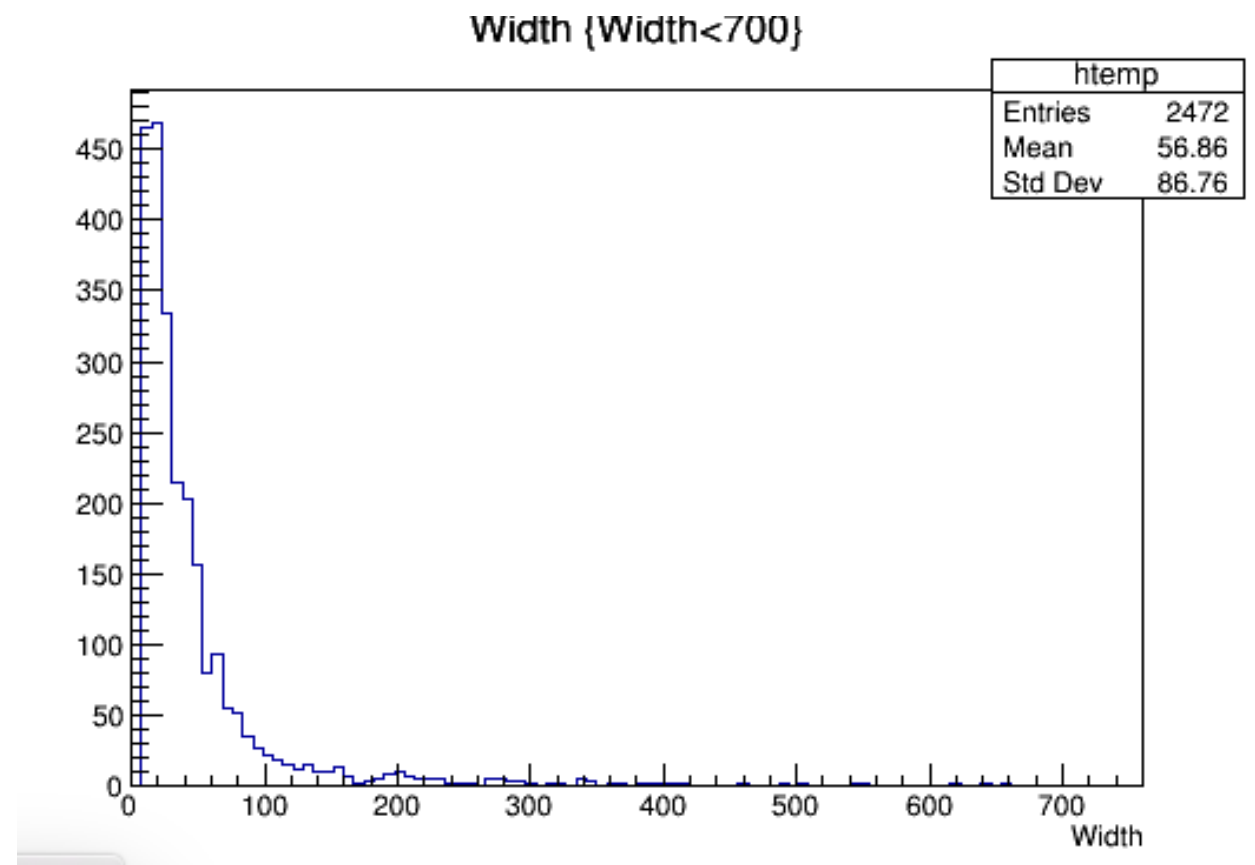
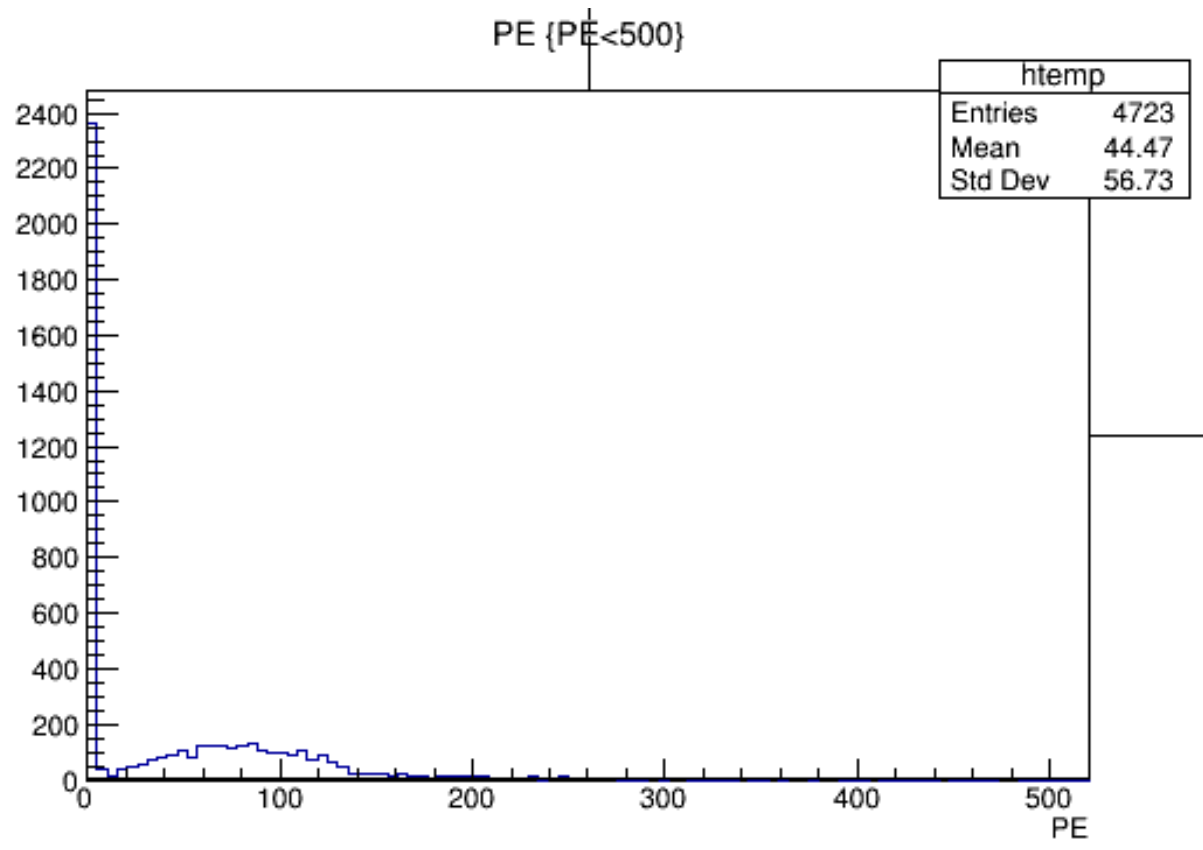
Fixes



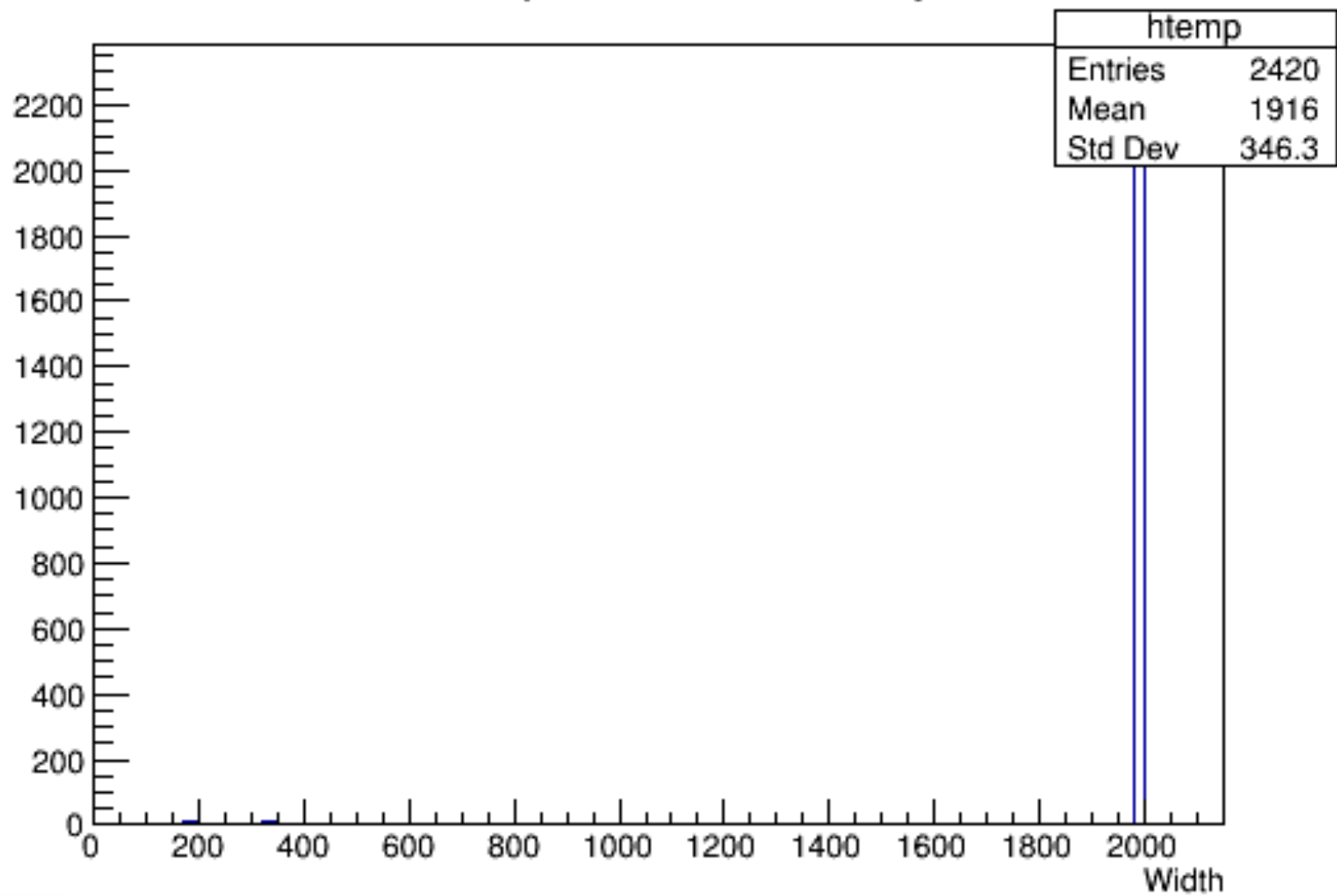
Previously – 1 Hit 13 mus long with amplitude ~ 400 and some crazy area

Now – 1 hit ~ 3 mus long + 2 hits ~ 1 mus long, plus 2 other hits (somewhere)

Easiest fix for the errant small hits is a change in the minimum width (in ticks) of a hit candidate.



Width {PE<500 && PE > 2}



Conclusions

- Still need to figure out average hit PE/width to fix the many small hits we see.
- Seems to be a possible issue with flashes now. Have not looked into- hopefully today
 - Might just be that previously we were seriously overcounting flashes due to almost all readouts counts as hits (baseline above 1500)

