Coin Ref Times Update 2025-08-14

Working on the Coin Reference time cuts for pionLT.
Finally found a good set of cuts that improve performance

Cuts have been pushed to github and tested for production data, the changes made mean that the Coin Time offset had to be redone but that has been fixed (Thanks Junaid)

The following shows the cut changes and before and after of coin time versus both HMS and SHMS delta (all plots from run 14616)

Next step is to investigate if this changes the behaviour of Coin Lumi

Cut Values

Before:

t_coin_trigNames="pTRIG1_ROC1 pTRIG4_ROC1 pTRIG1_ROC2 pTRIG4_ROC2"

pTRIG1_ROC1: 5100 – 6200
pTRIG4_ROC1: 5600 – 6200
PT2: 4700 – 6000
pTRIG1_ROC2: 5800 – 7000
pTRIG4_ROC2: 6300 – 7000

After:

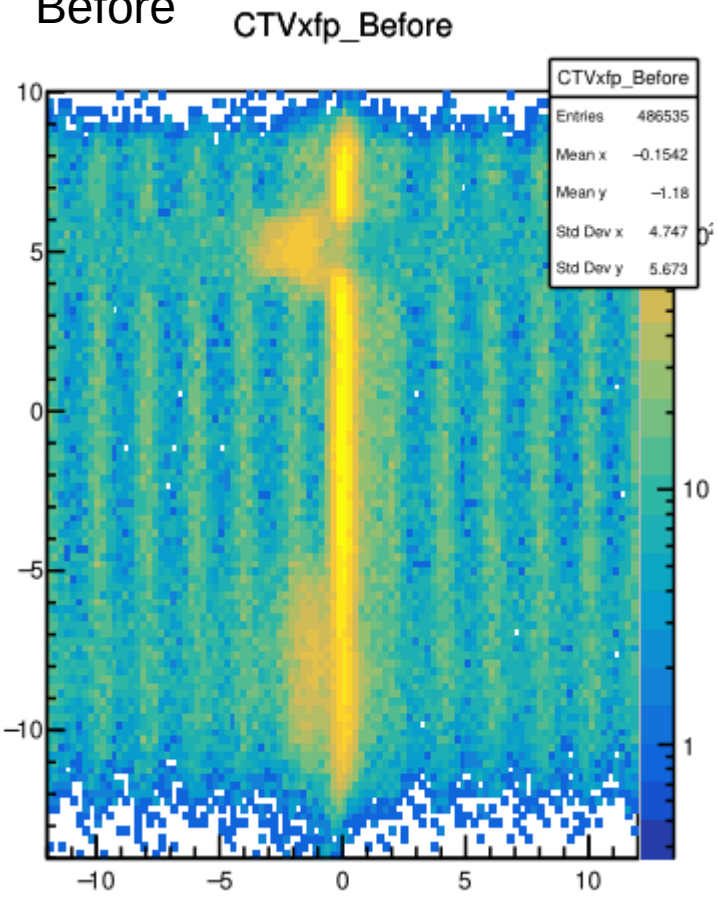
t_coin_trigNames="pTRIG1_ROC1 pTRIG3_ROC1 pTRIG1_ROC2 pTRIG3_ROC2"

hT2: 2400 - 4600
hTRIG3_ROC1: 3400 – 4600
pTRIG1_ROC1: 4600 – 6200
pTRIG1_ROC2: 5400 – 7000
pTRIG3_ROC2: 4200 – 6500

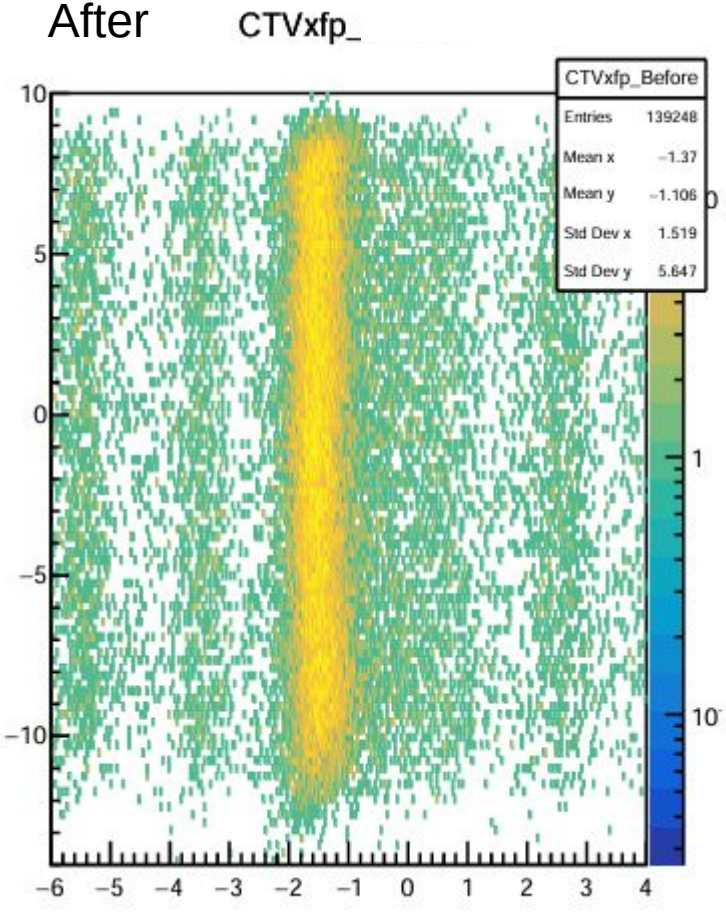
The before here is what I had set for the offline cuts. We had also been using yet a different set from online by mistake.
On that note make sure your replay scripts do not contain:
gHcParms->Load("PARAM/TRIG/tcoin.param");
Or similar as this will override the choice in standard.database

HMS xfp Vrs CoinTime

Before

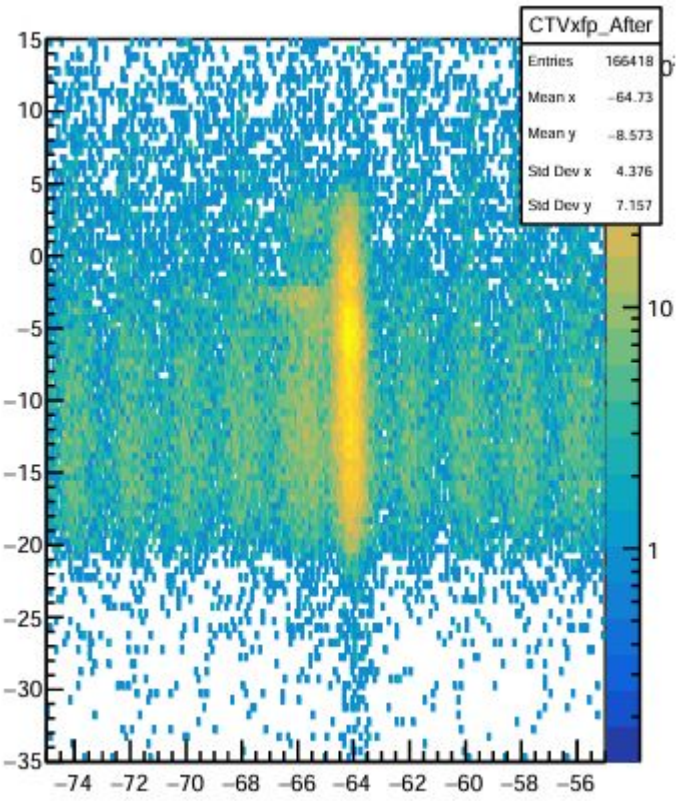


After

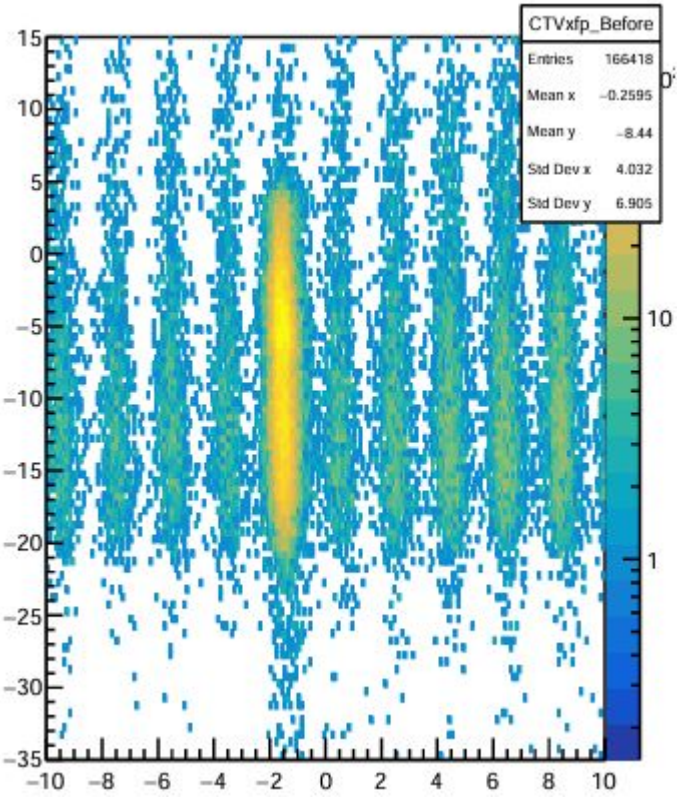


SHMS xfp Vrs CoinTime

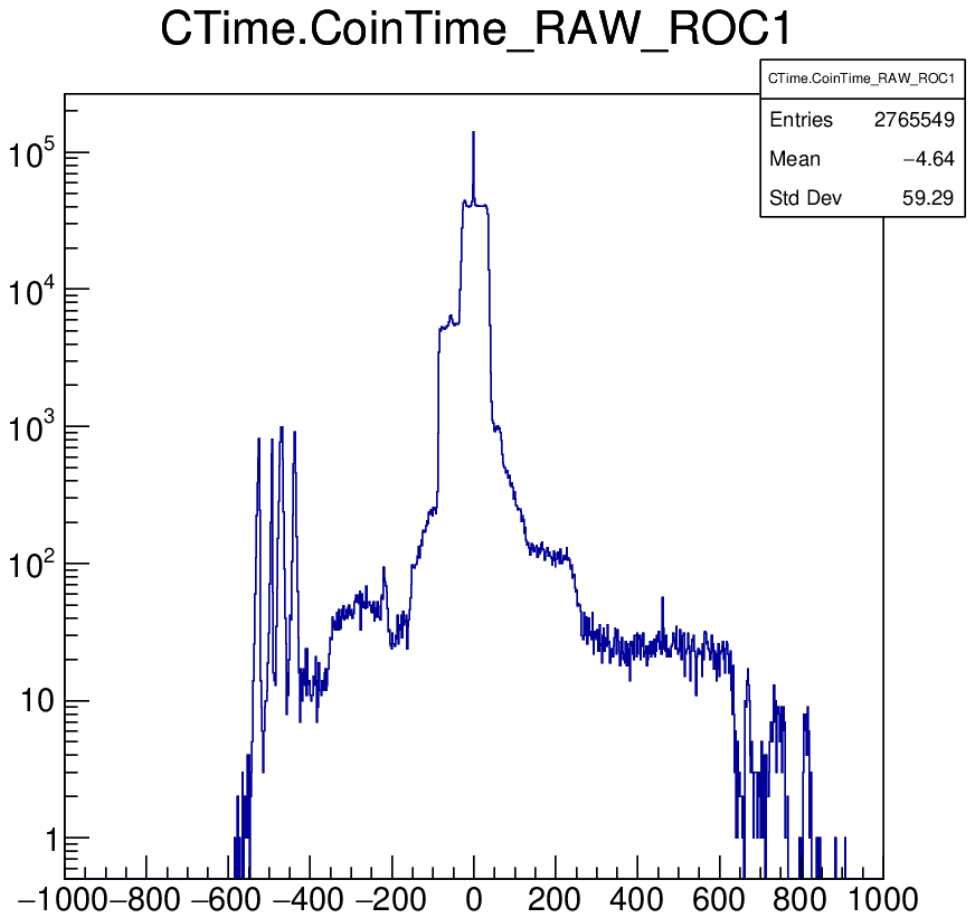
Before

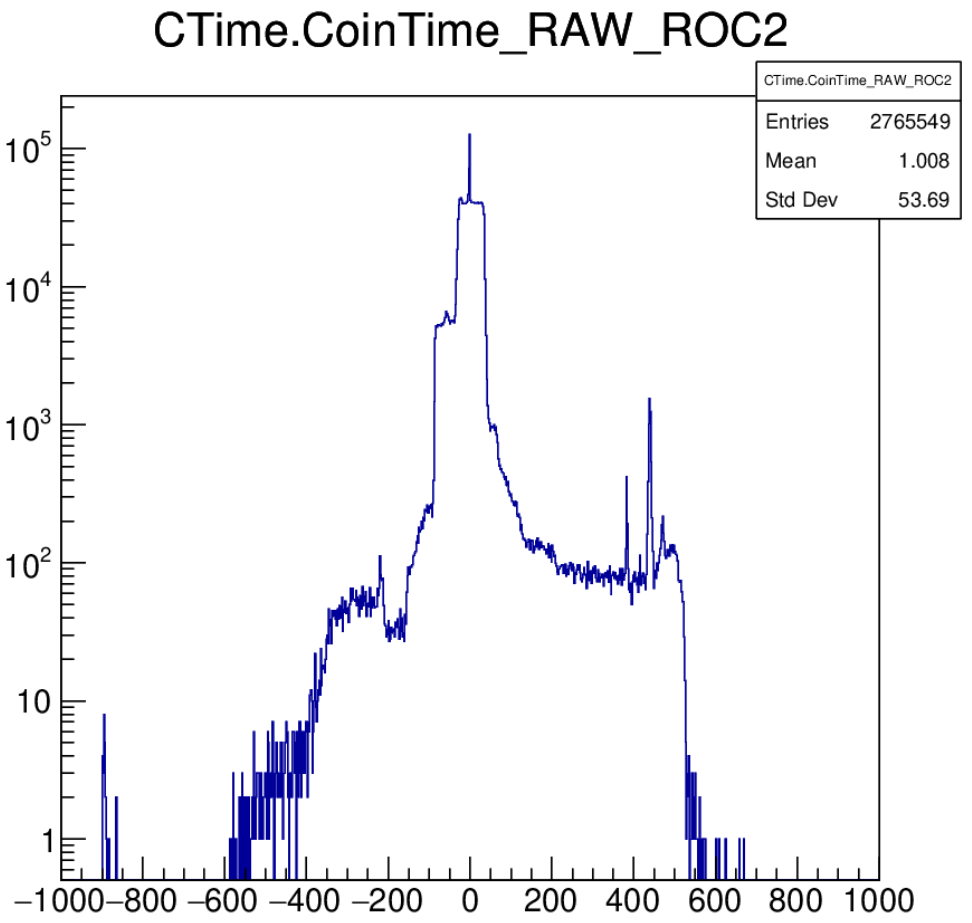


After

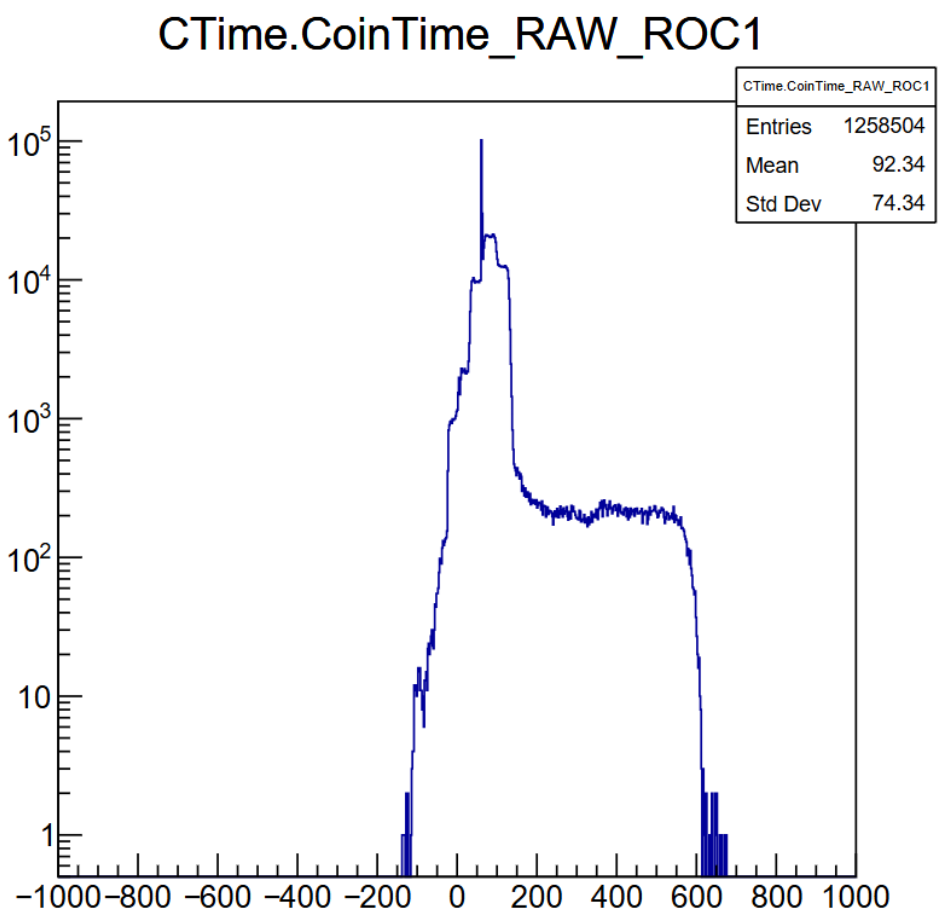


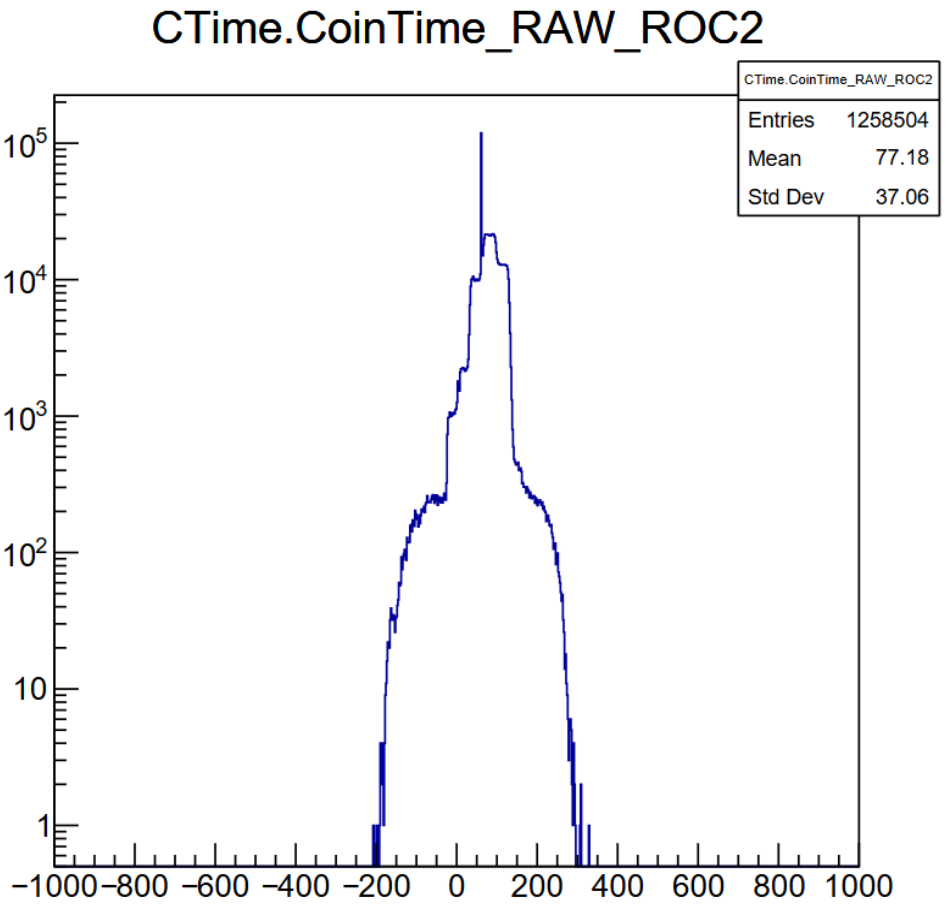
Raw Coin Time Before





Raw Coin Time After





Conclusion

Significant improvement in the coin time spectrum.

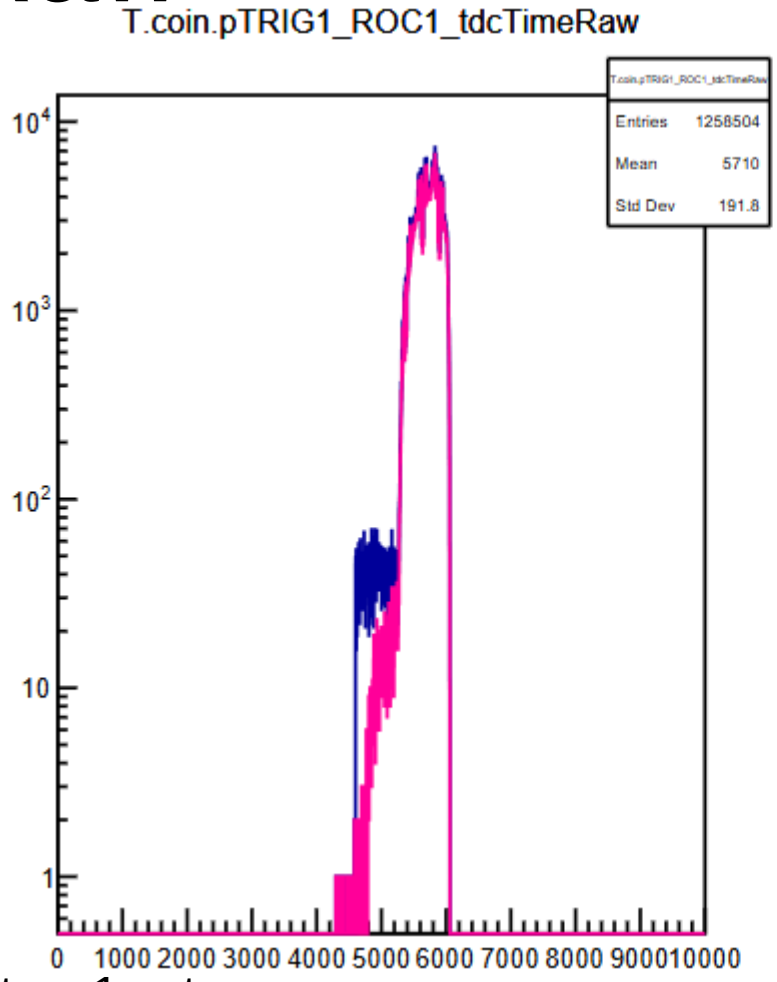
I plan on using ROC2 for my coin time needs as it’s much cleaner.

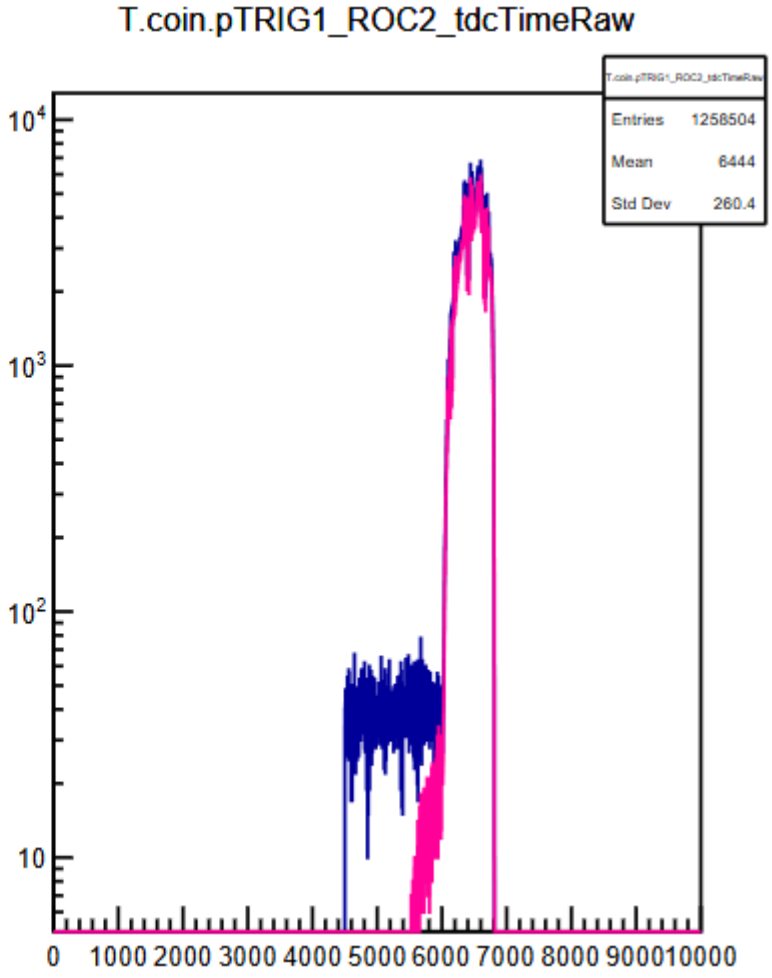
As of writing I’m still waiting on Junaid to push his CT offset fix to the main Jlab github, So I cannot yet procced with the lumi part of the study.

I am working on a more formal write up, and would like to present these results to the quarterly analysis meeting. I currently don’t know why the old set of cuts don’t work and why the new ones do, it’d be helpful to have the eyes of a hardware expert to explain.

In backup I have plots of all the variables mentioned in slide 2 for posterity.

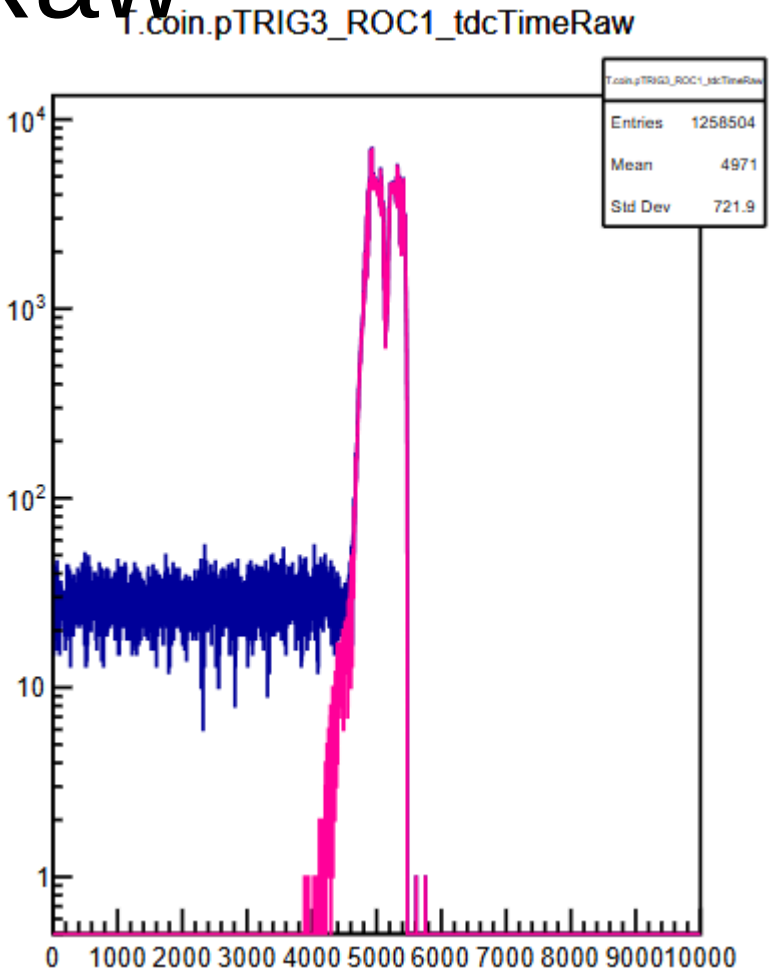
pTrig1_Raw

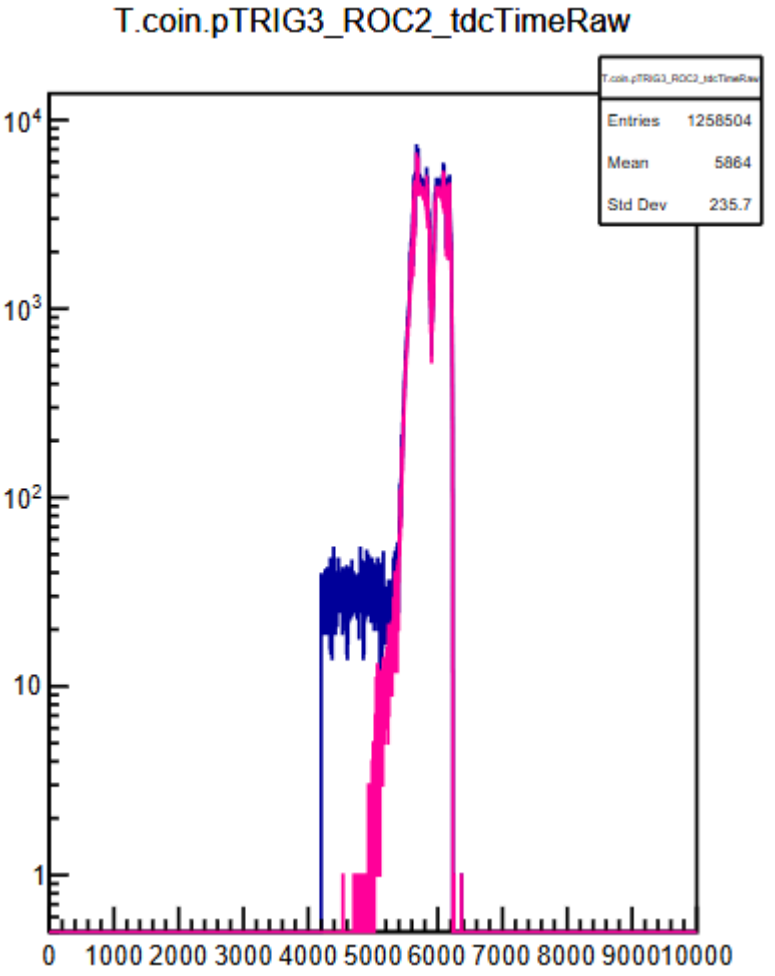




Blue is all data
Pink is with multiplicity = 1 cut

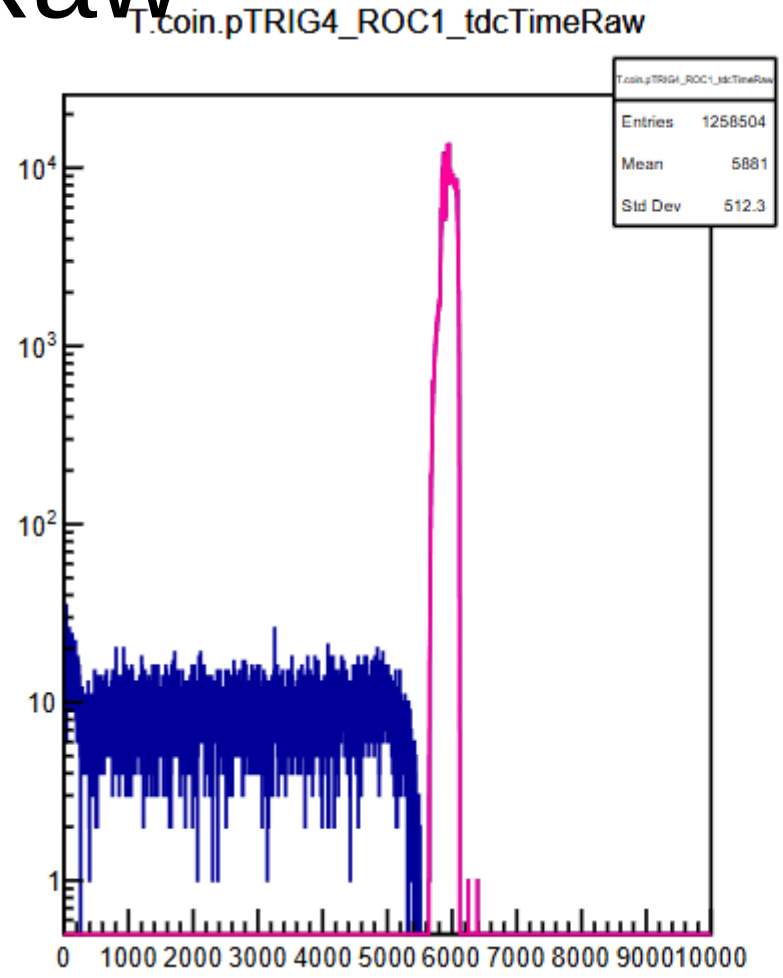
pTrig3_Raw

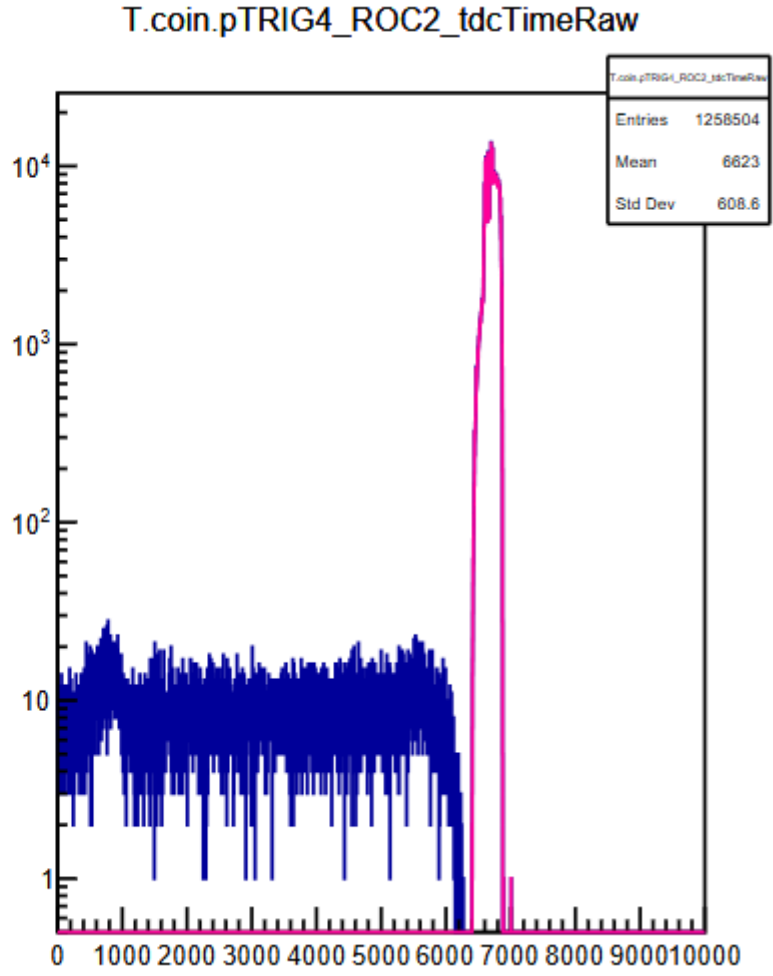




Blue is all data
Pink is with multiplicity = 1 cut

pTrig4_Raw





Blue is all data
Pink is with multiplicity = 1 cut