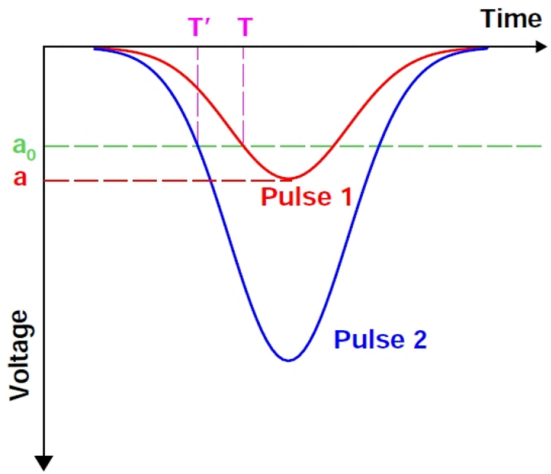
Outline

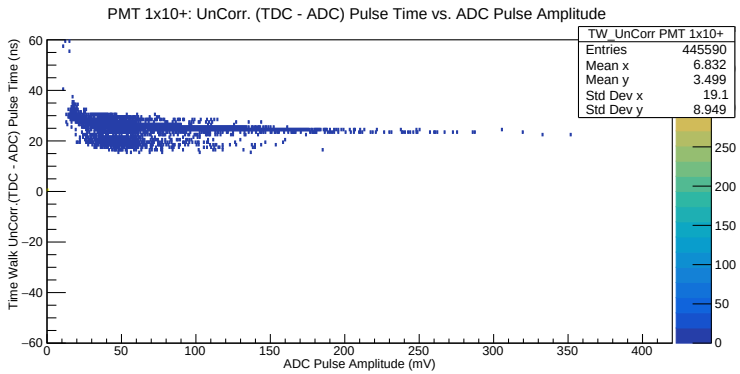
Hodoscope calibration involves 4 steps:

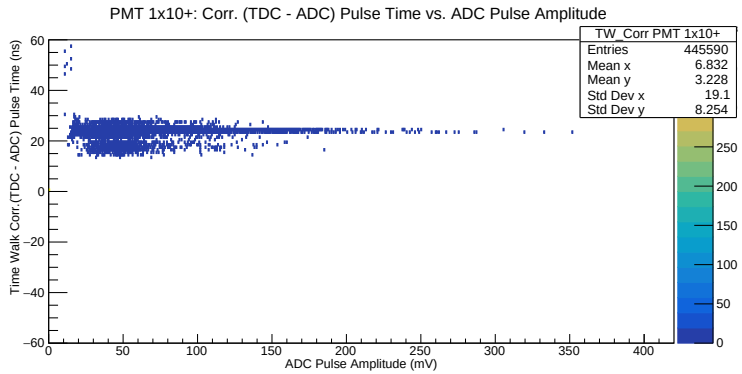
- Time Walk t_{TW}
- Cable Time t_{cable}
- Propagation Time t_{prop}
- Time Difference between Planes t_{λ}

So far I have looked at t_{TW}. For info on how each step is done go to:
`hallcweb.jlab.org/DocDB/0009/000970/001/hodo_calib.pdf`



To account for the time walk we fit this: $f_{TW} = c_1 + \frac{1}{\left(\frac{a}{TDC_{Thrs.}}\right)^{c_2}}$





Since c_1 is just an offset, for calibration we only care about c_2.

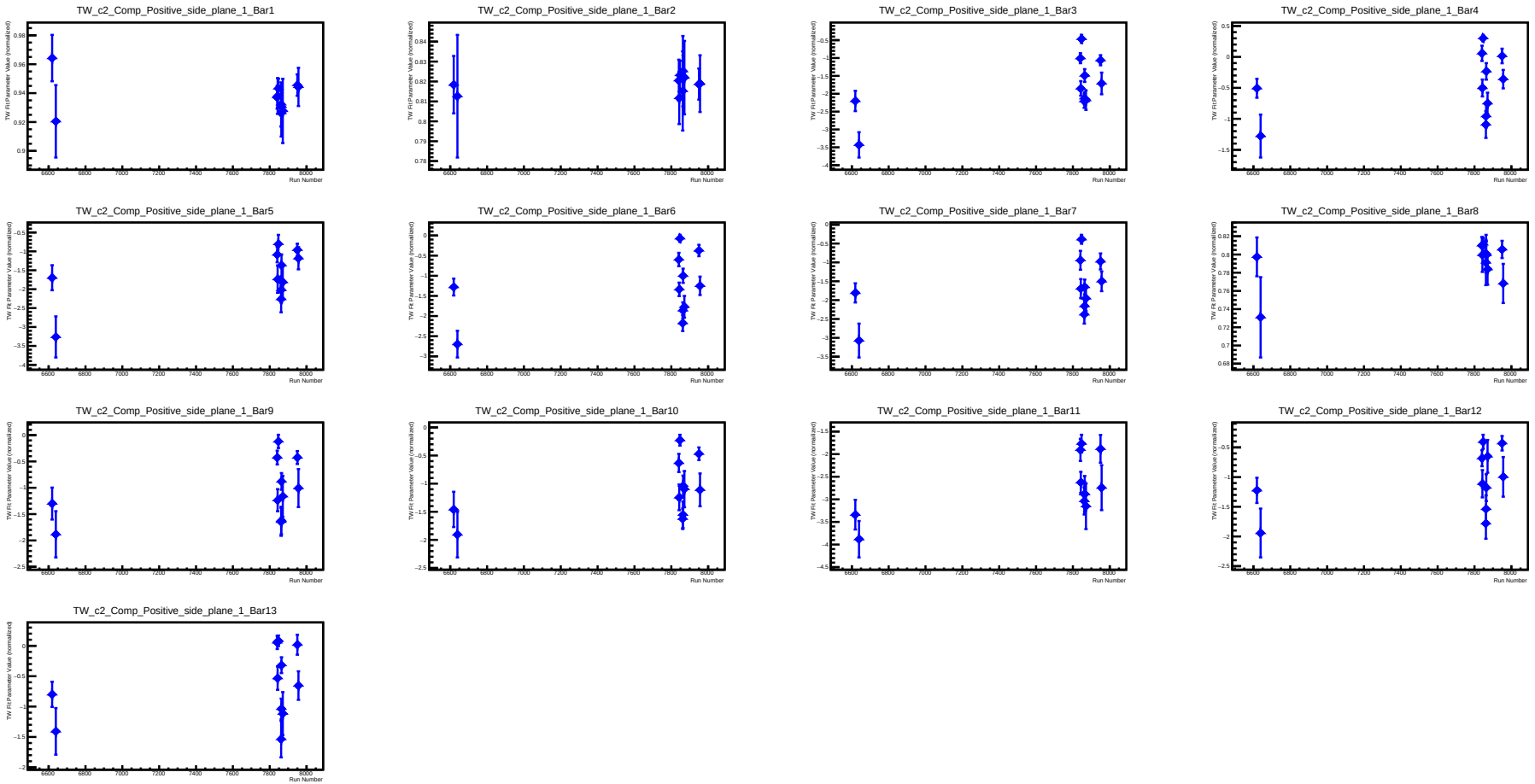


Figure: tracking all positive PMTs on the 1st hodoscope plane

similar plots are made for the other planes

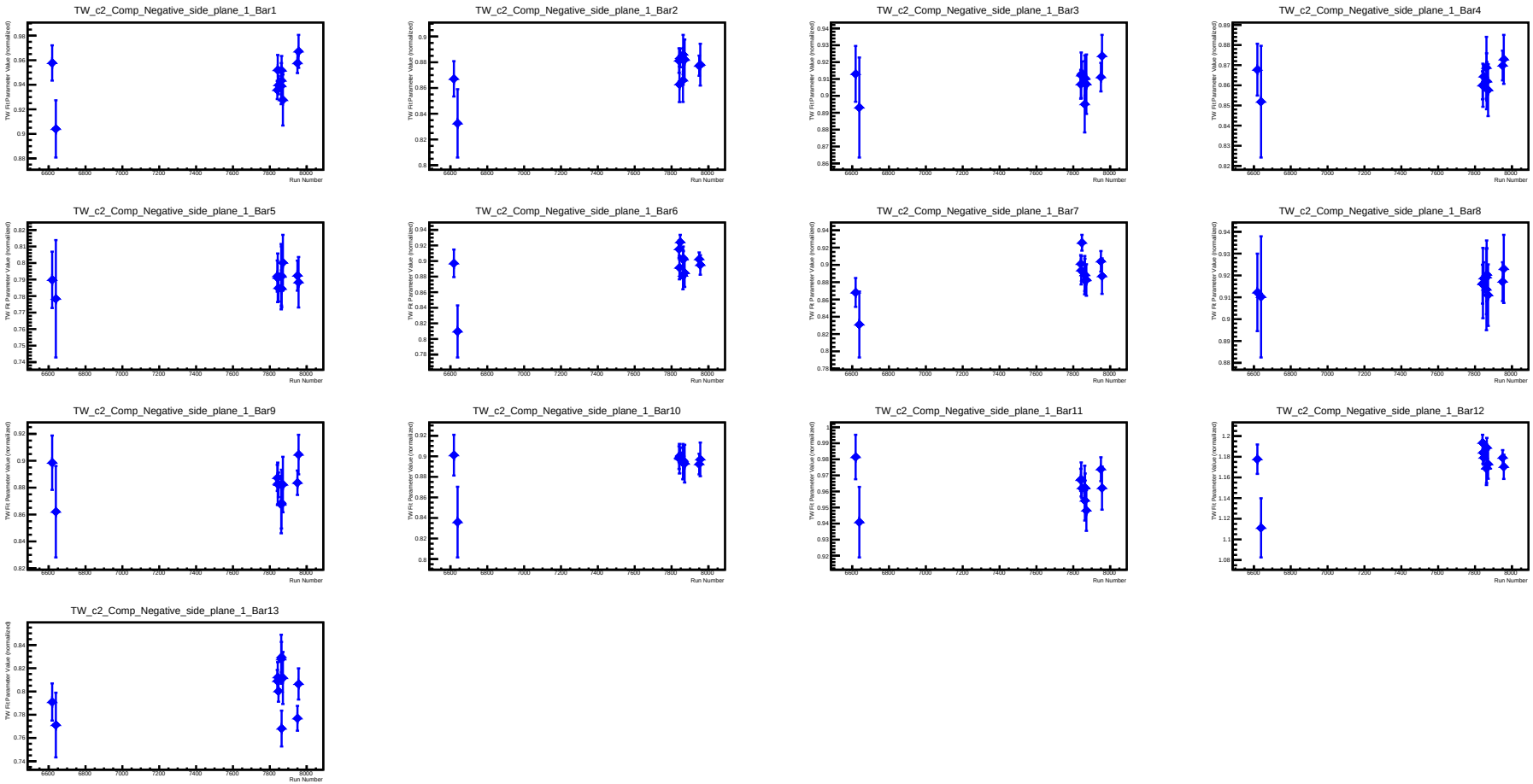


Figure: tracking all negative PMTs on the 1st hodoscope plane

Reference Times

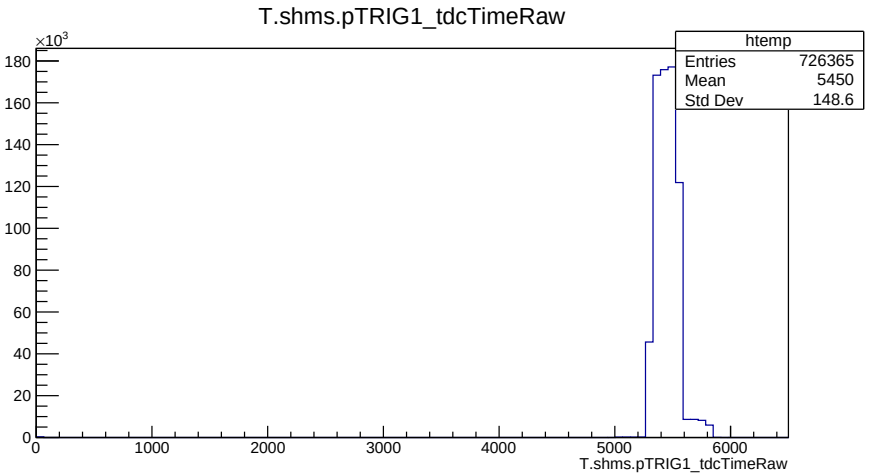
I have just fiddled with these a little bit, but I have no idea what they do.

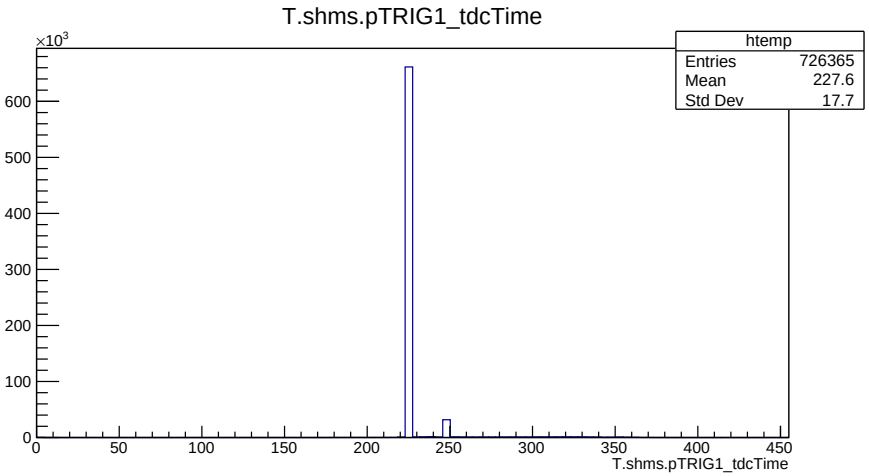
```
; BAR NUM:          1   2   3   4   5   6   7   8   9   10    11     12     13      14      15      16
 31     32     33     34     35     36     37    38       39      40     41      42        43     44
   59
t_shms_tdcNames = "pT1 pT2 p1X p1Y p2X p2Y p1T p2T pT3 pAER pHGCER pNGCER pDCREF1 pDCREF2 pDCREF3 pDCREF4 p
TRIG6 hTRIG1 hTRIG2 hTRIG3 hTRIG4 hTRIG5 hTRIG6 pSTOF pEL_LO_LO pEL_LO pEL_HI pEL_REAL pEL_CLEAN hSTOF hEL_
 pHODO_RF"

t_shms_TdcTimeWindowMin = 4100, 4100,    0,    0,    0,    0,    0,    0, 3900,    0,
                             0,    0,    0,    0,    0,    0,    0,    0,    0,    0,
                             0,    0,    0,    0,    0, 5000, 5000,    0,    0,    0,
                             0,    0,    0,    0,    0,    0,    0,    0,    0,    0,
                             0,    0,    0,    0,    0,    0,    0,    0,    0,    0,
                             0,    0,    0,    0,    0,    0,    0,    0,    0

t_shms_TdcTimeWindowMax =   4600,   4500, 100000, 100000, 100000, 100000, 100000, 100000,   4300, 100000,
                          100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000,
                          100000, 100000, 100000, 100000, 100000,   6000,   6500, 100000, 100000, 100000,
                          100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000,
                          100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000,
                          100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000, 100000
~
```

Figure: /PARAM/TRIG/tshms.param, I have changed pTRIG1 and pTrig2

Reference Times

Here pTRIG1 has min = 5000 and max = 6000





I am unsure as to whats happening here, entries seem to just move.