

TOF Update

- Kevin Wilson's alpha correction
- Investigation of superluminal – cross talk
- Temperature and time offsets
- Plans for the future

7/12/07
MIPP Analysis meeting

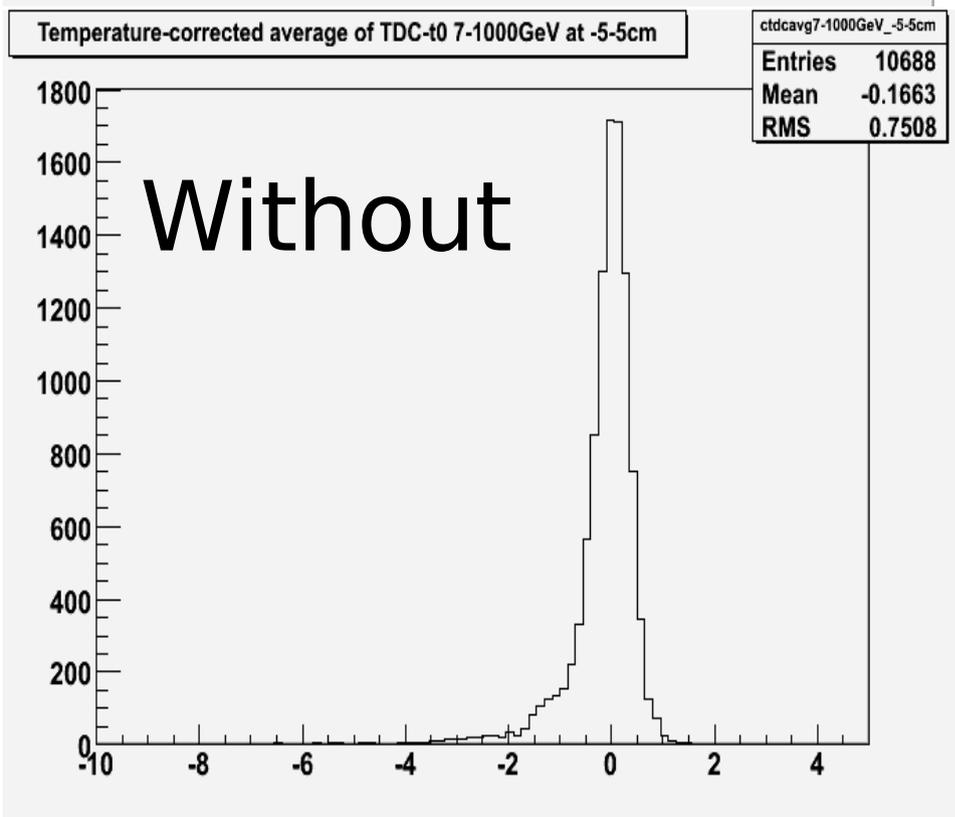
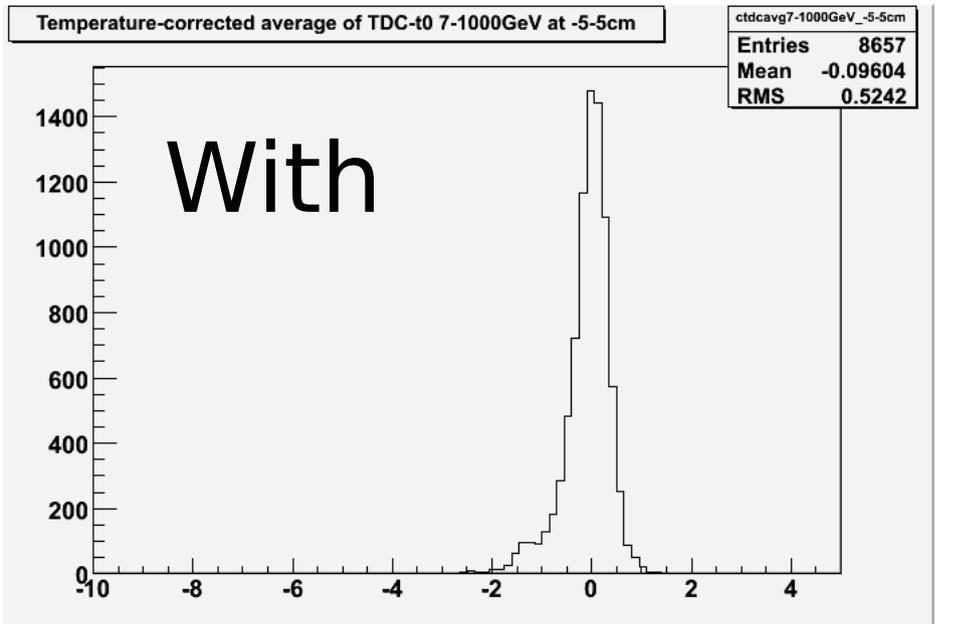


University of South Carolina
High Energy Physics Group

Alpha Correction

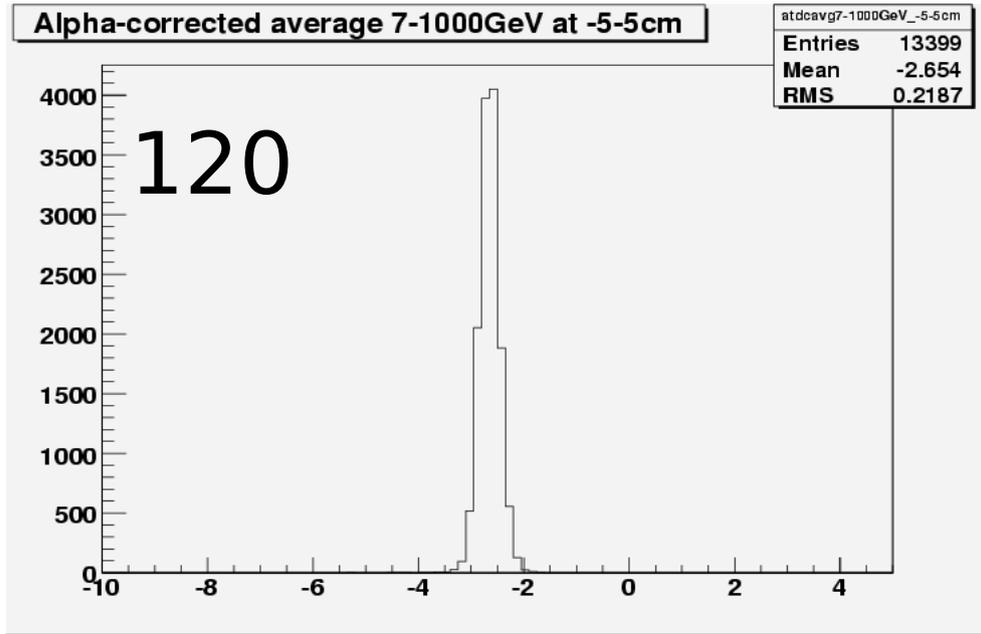
- Using beam tracks at the moment to correct for ADC pulshape
- Also correct simultaneously for y position in bar
- Concentrating on center of the bay due to low statistics when moving away from center
- Will apply temperature correction next which will allow combining more runs to increase statistics

Effect of Pileup

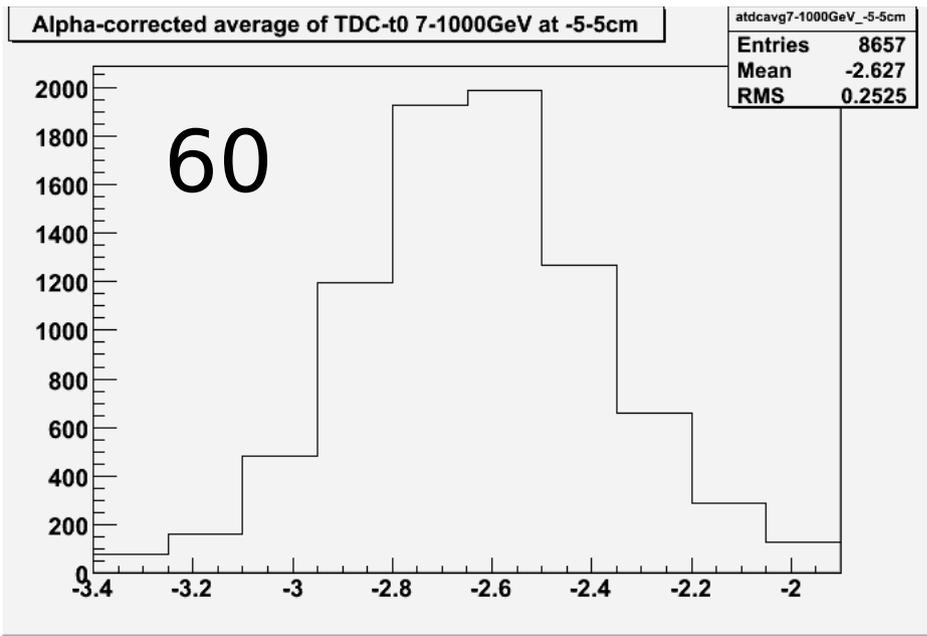


- As mentioned in previous talks, we use Andre's pileup cut.
- This is tuned for 120 GeV. We will retune it for other momentums, but for now we use it without the beam cerenkov conditions
- This is an example for 60 GeV beam

Bar 320

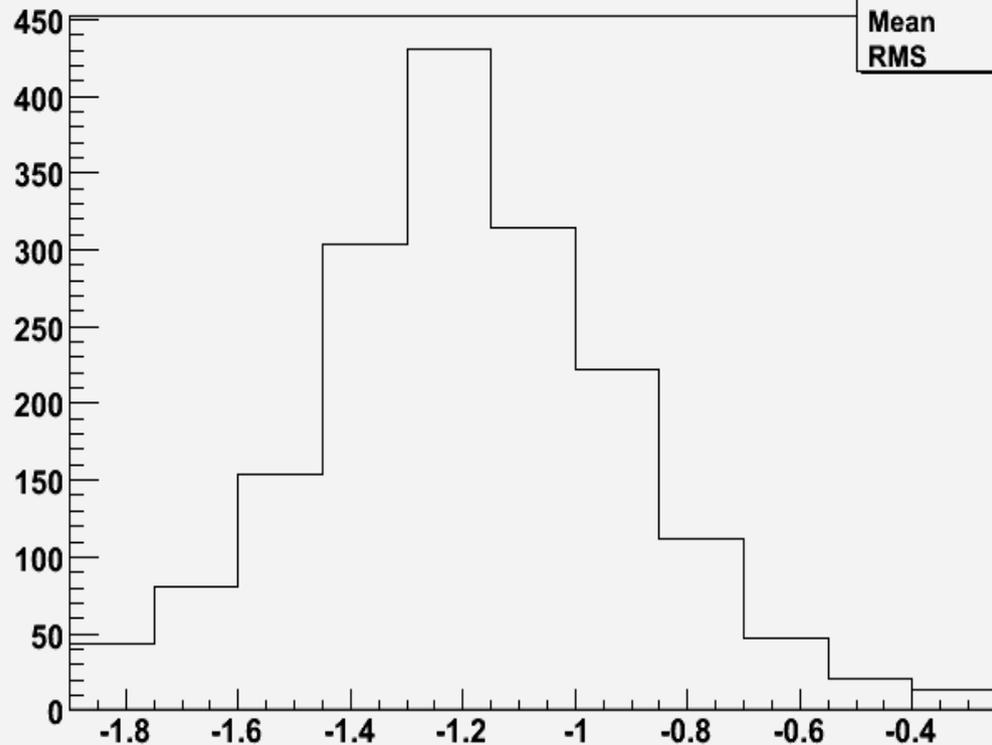


- Bar 320 is hit by 120 and 60 GeV beam
- Apply temperature and alpha correction and plot time resolution



Bar 321

Alpha-corrected average of TDC-t07-1000GeV at -5-5cm

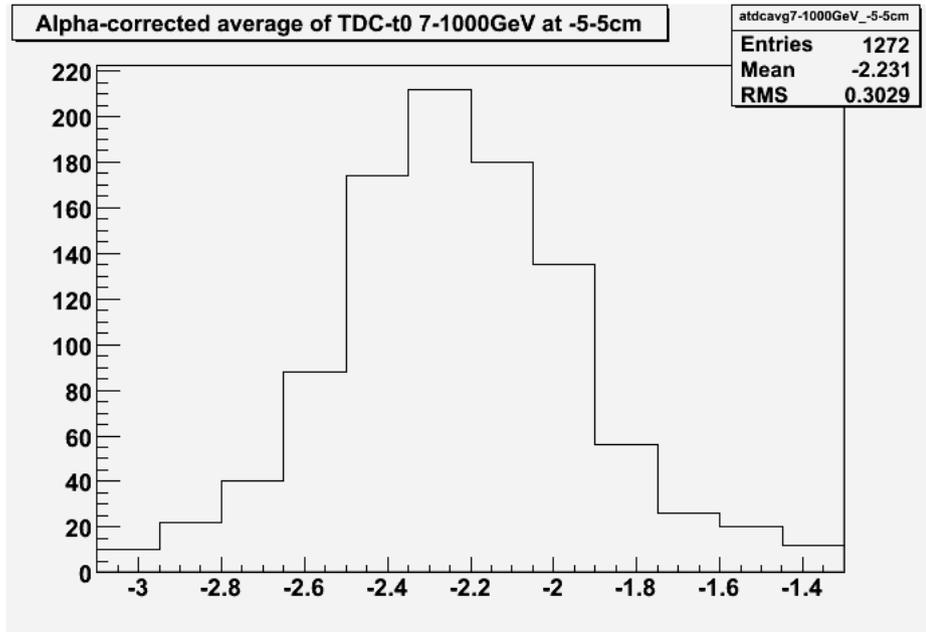


atdcavg7-1000GeV_-5-5cm

Entries	2235
Mean	-1.188
RMS	0.2829

- Use -60 GeV beam so beam hits bar 321

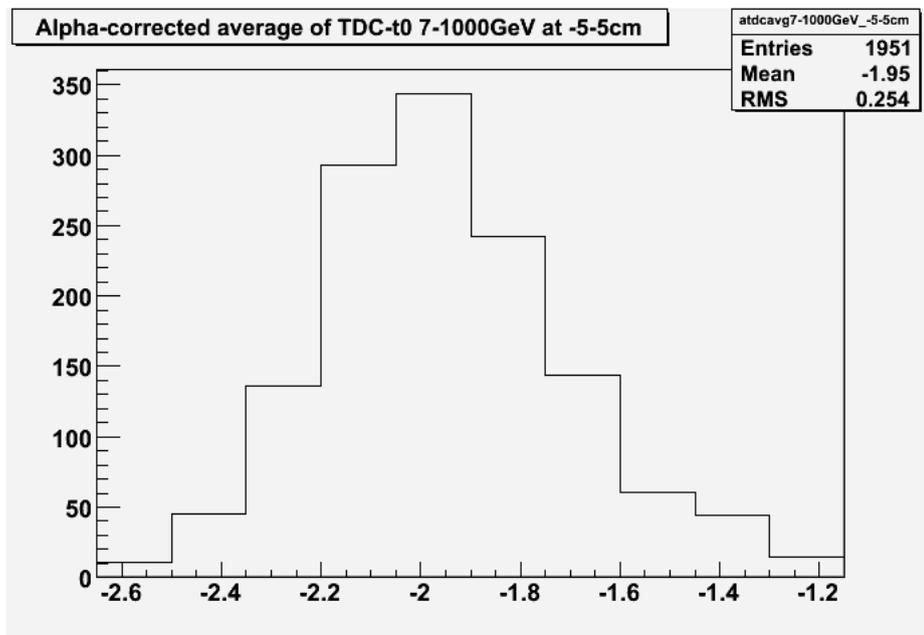
Bar 322



- Hit by -20 GeV beam

Bar 319

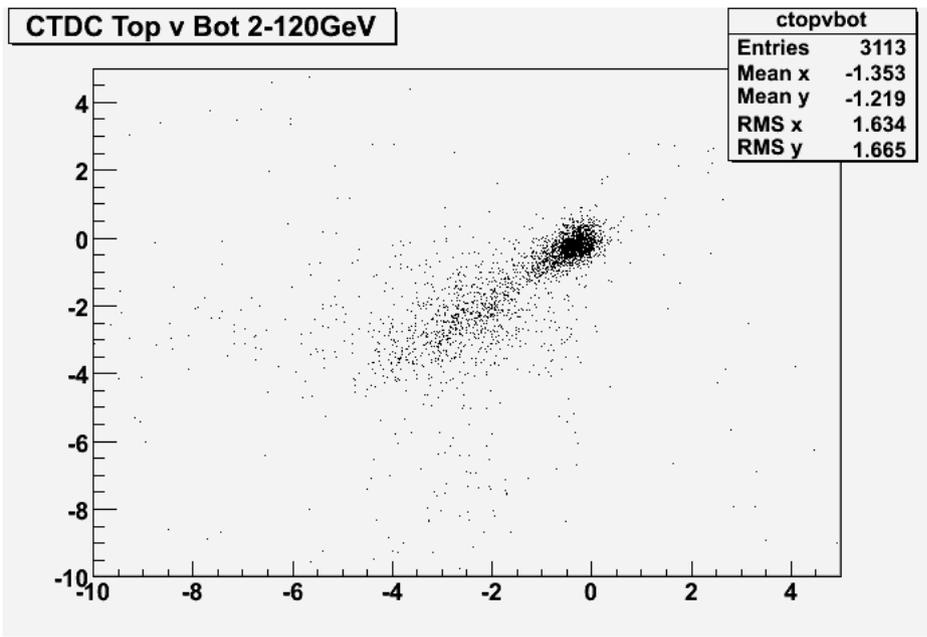
- 20 GeV beam hits bar 319



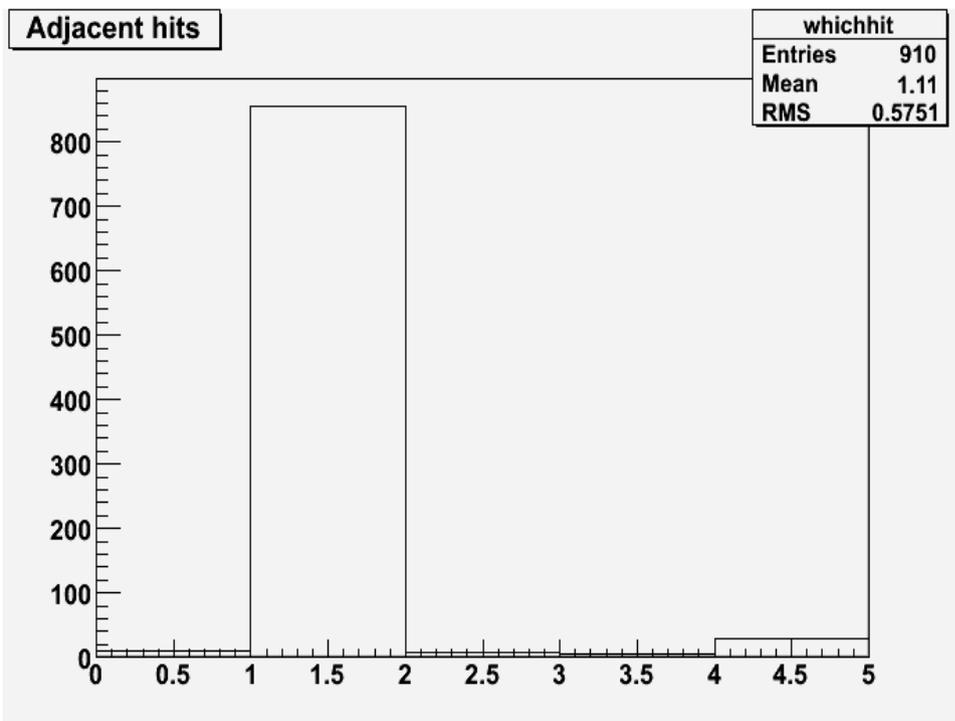
Crosstalk as suspect for Superluminals

- Previously showed that Bar 320 is only superluminal when bar 319 is hit, indifferent to 321
- 321 is indifferent to 320 too – it is read out on the opposite side of the hall
- 319 is affected by 320 – as expected

Crosstalk



- Top plot shows the TDC of the top pmt versus bottom pmt for bar 320
- As shown before, fast top implies fast bottom
- Look at those events in the fast-fast group

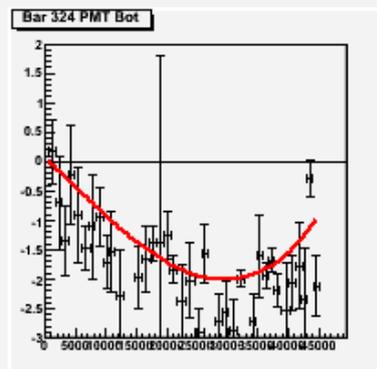
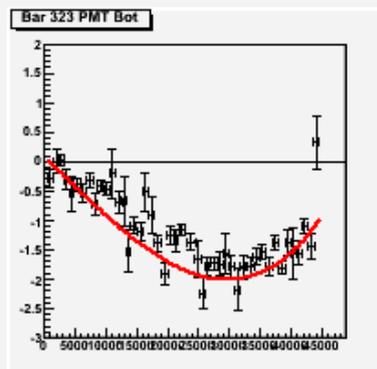
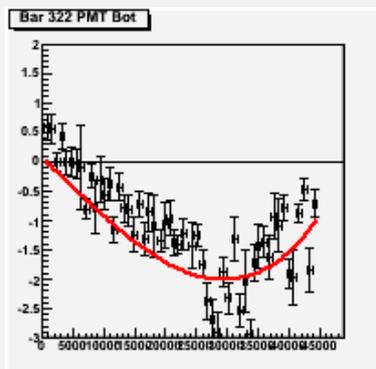
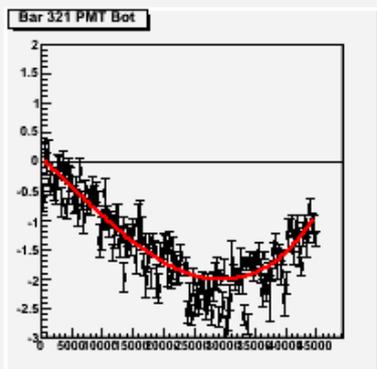
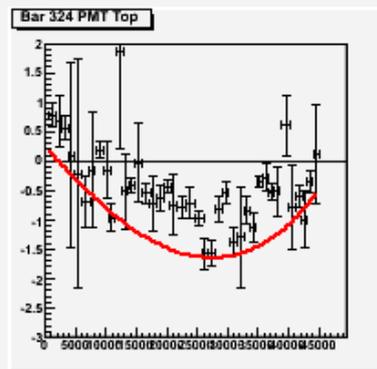
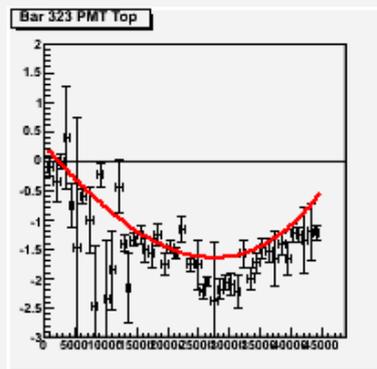
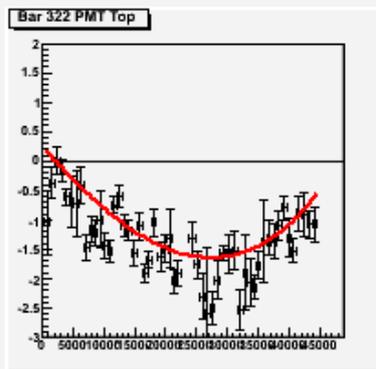
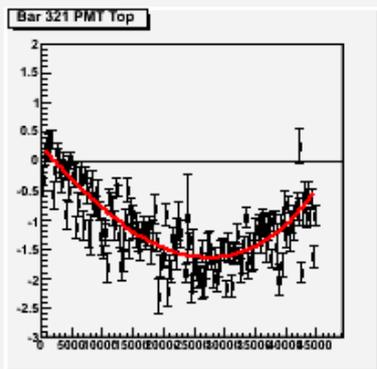
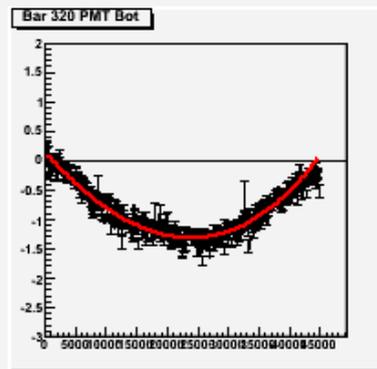
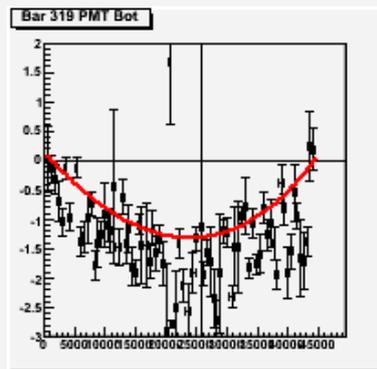
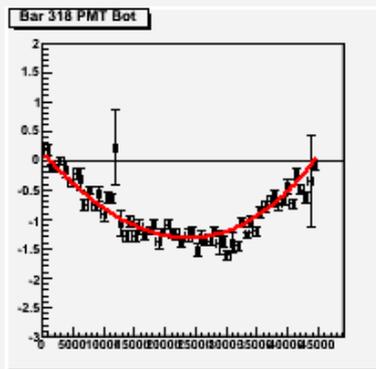
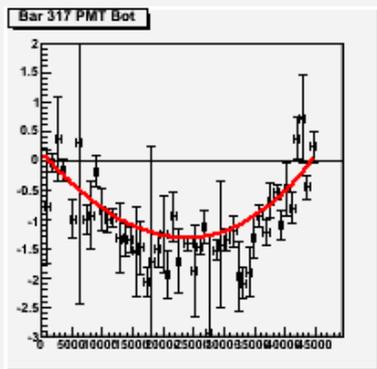
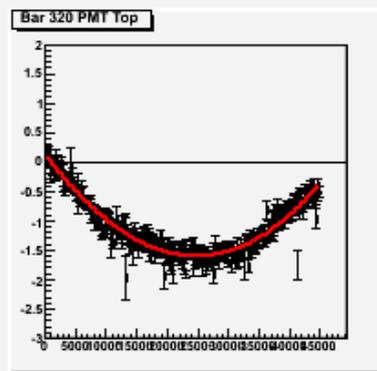
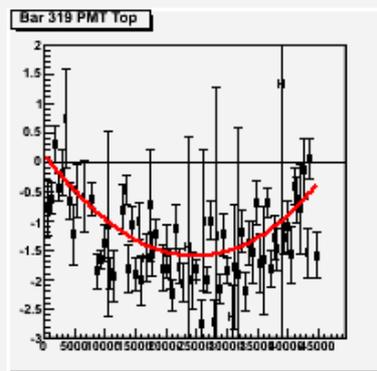
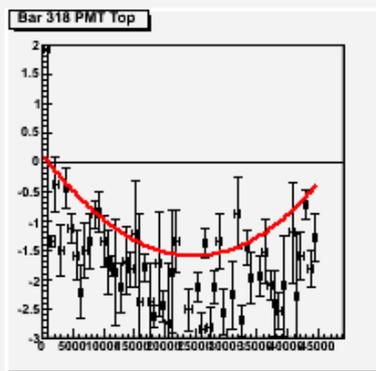
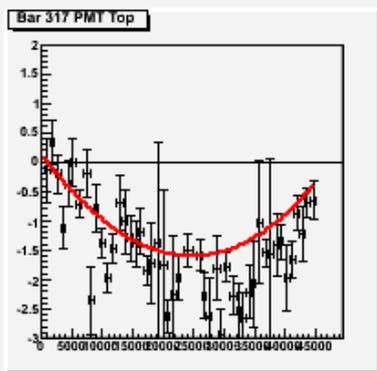


- Bottom plots shows adjacent hits for this group
 - 0 – no hits
 - 1 – top and bottom of 319
 - 2 – top of 319 only
 - 3 – bottom of 319 only
 - 4 – top and bottom of 321 only

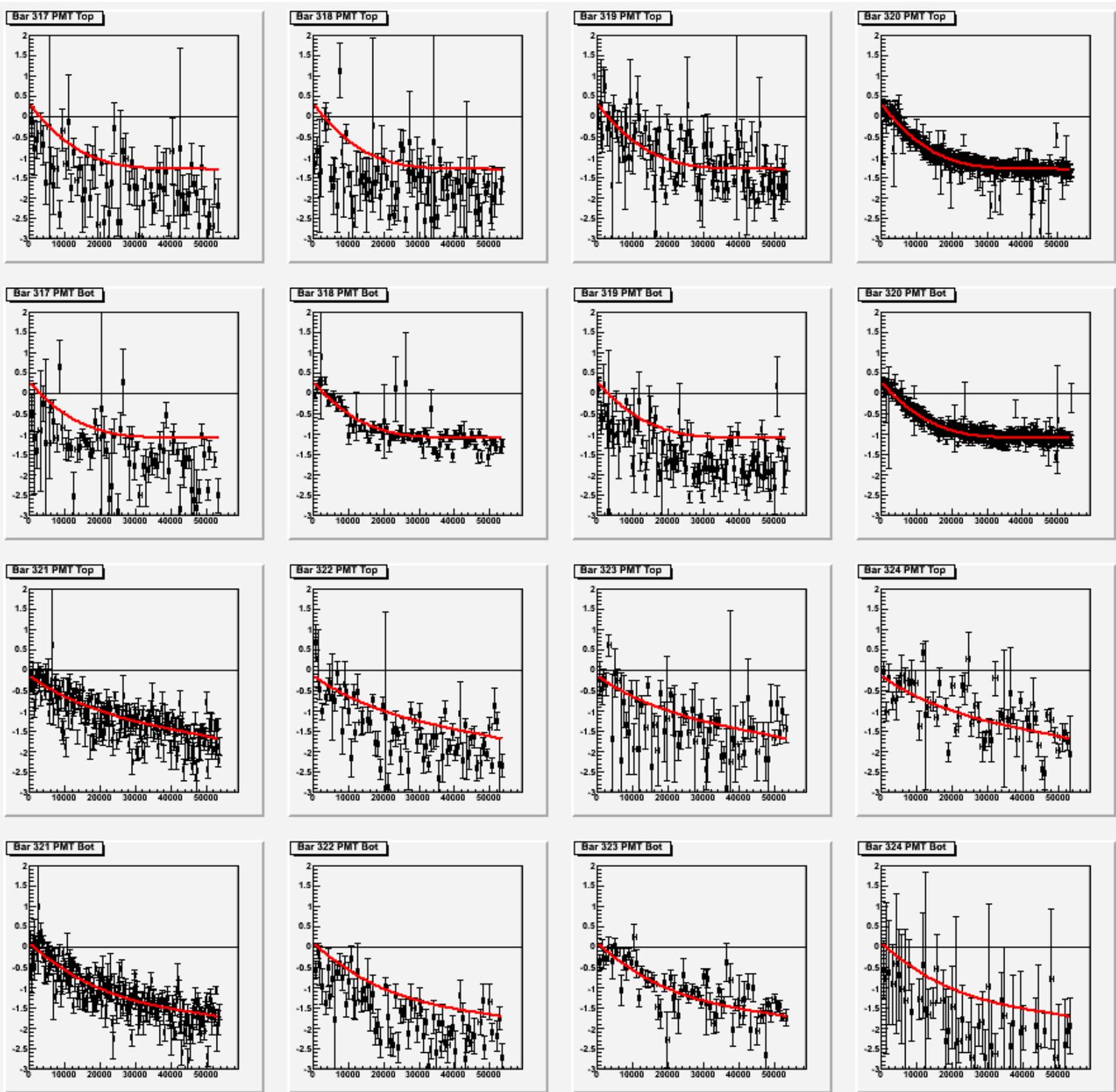
Temperature Correction

- Temperature correction code removes changes in delays due to temperature changes in the hall
- Code also produces time offsets for each bar.
- Code runs on DST, but was never run on previous pass 3
- I updated it for current DST which has different (and easier to use) TOF variables
- Able to reproduce results reported:
<http://barney.physics.sc.edu/~godley/mipp/060824/>

Infamous run 15337



Another long run 15860



Results

- Works as well as before
- New DST is PMT and not track based, but still can use extra PMT only (no track match) as position of hit is needed to reduce spread in TDC
- Will add db code and run on entire data at USC to populate db with fit parameters and offset.
- Have to write a routine to apply the correction
- Code submitted to CVS

Extras

- Added AdjacentHit to DSTUtil which checks for adjacent TOF hits to select a superluminal free sample
- Submitted Kevin Wilson's cut table class in DSTAnalysis, which TOF2007 relies on – useful class for monitoring effects of your cuts.

Future

- This work is being written up in a MIPP memo, available tomorrow
- Will reproduce the momentum versus velocity plot with temperature corrections
- Carl and Kevin will continue work on cross talk