Outline

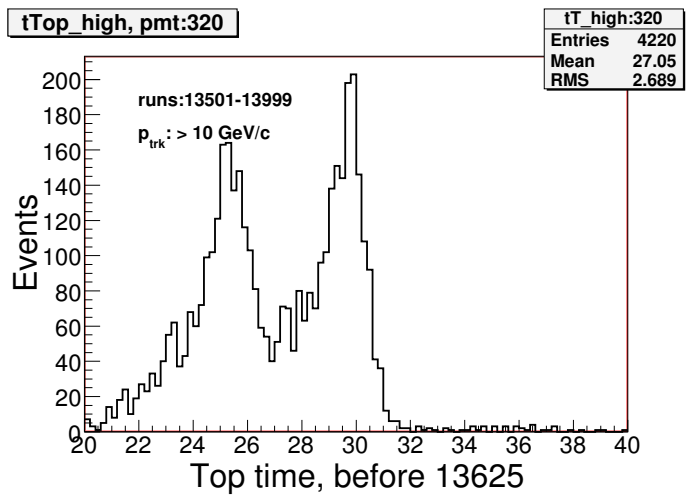
- in run 13625 ToF time delay changed by 3 ns effecting West pmt's.

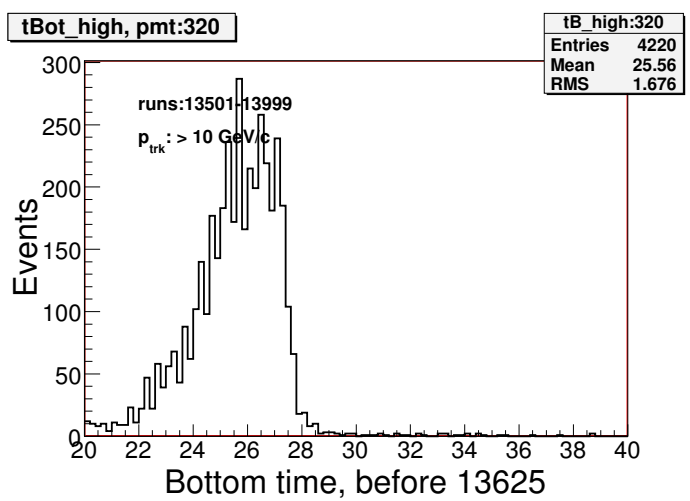
  Need to find how big? Also it effecting East pmt's, but it shouldn't. Coincidence?

- in run 15964 ToF HV changed from -800V to -880V. What is effect on TDC time?

- recalculate the TDC time vs temperature correlation. More wide temperature range,

Bar 320 East side: what was problem?



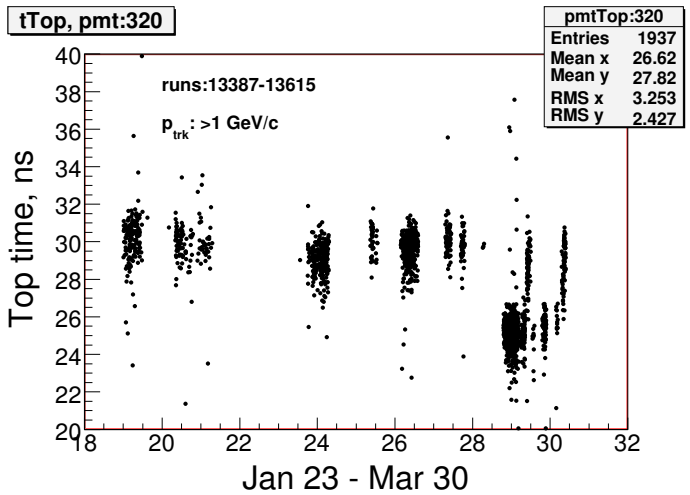


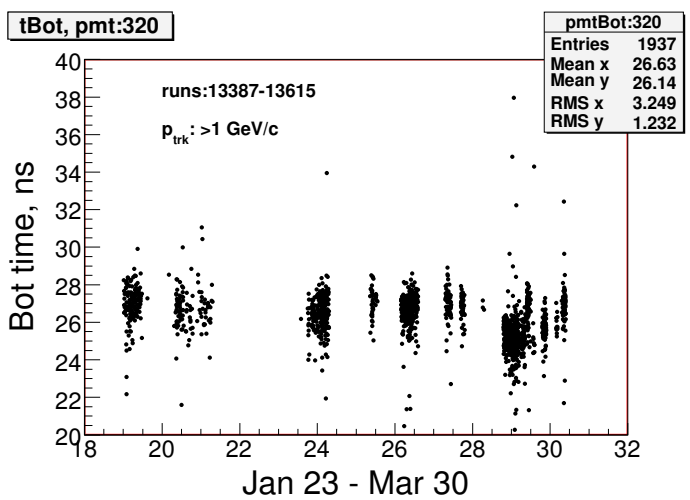
These plots is a reminder.

The time distributions for Top and Bottom pmt 320 with runs 13501-13624, where I do not expect to see any changes. Fixing ToF problem at run 13625 should not effect the East pmt's.

Both plots indicates that there is at least one additional source of the time variation exist in run 11606 - 13624 range. More work to do.

try to find time, when something happens





How to approach to the problem?

- - minimize the temperature effect: use 27$\pm 0.5^o$C
- - minimize the adjacent bar effect
- - minimize the bar length effect using tracks at center
- - make TDC time distribution vs the calendar days plot

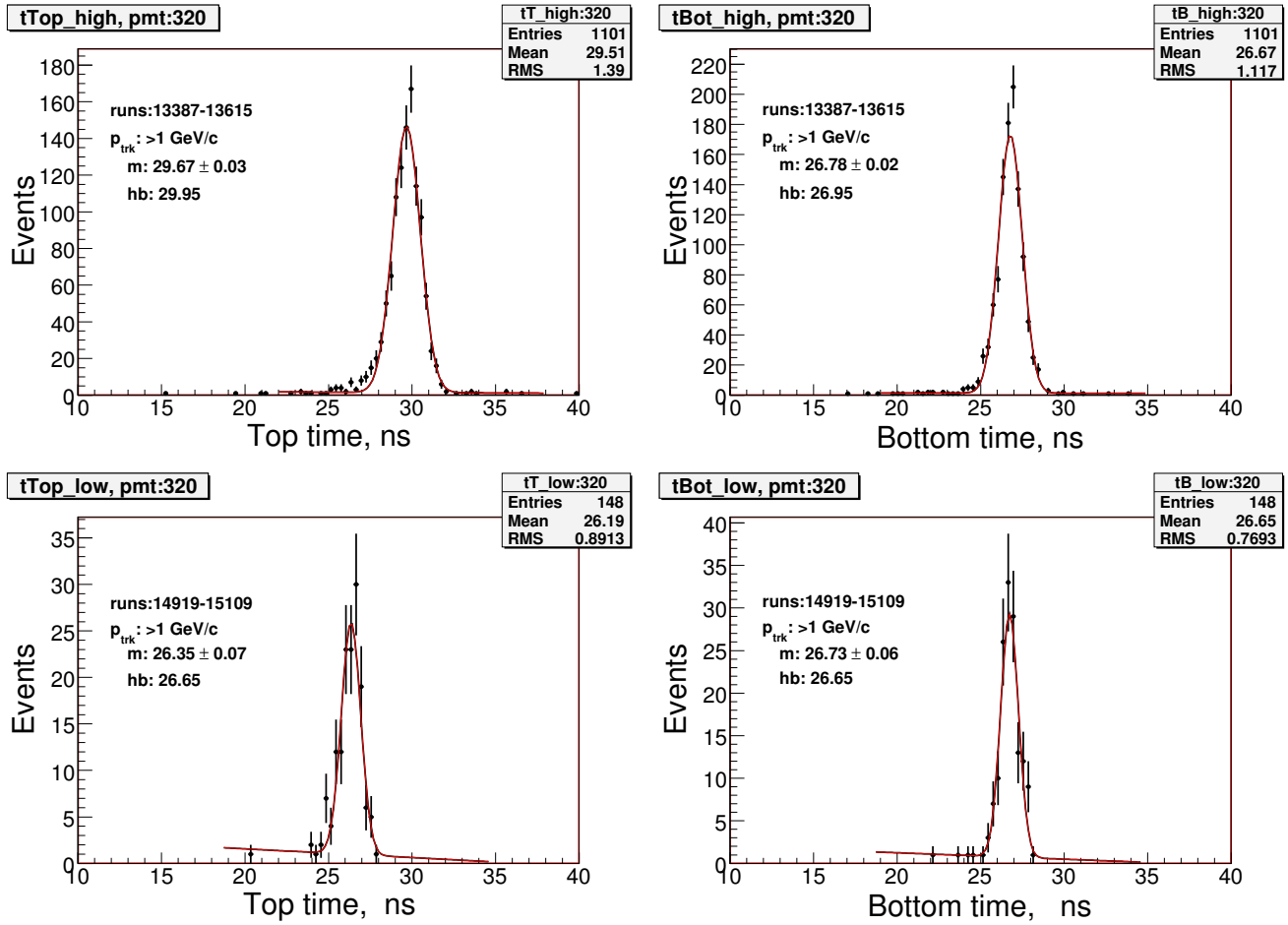
The time distributions for Top and Bottom pmt's bar 320 vs January 23 - March 30 calendar days, using pass4aii data, runs 13387-13615. The top plot indicates that there is 4-5 ns delay drop at end of March 28. For bottom pmt I see 1-2 ns time drift. What happens at end of March 28?

Logbook tells (Monday March 28 15:48): John Chyllo... have been alerted about the AC problem... John Chyllo ..delivered a 3 foot diameter floor fan which we have placed downstream of DC3's electronics pointed at DC4..... MCTEMP1(downstream air temp) and MCTEMP2(air temp DC3) rose last night from 23.5C and 25.75C at 6am to 25.5C and 30.2C at 1:30pm. At 1:20 pm we restarted the AC and the temps droped to 25.0 and 26.5C

Solution (now): not use the data within runs: 13567-13599.

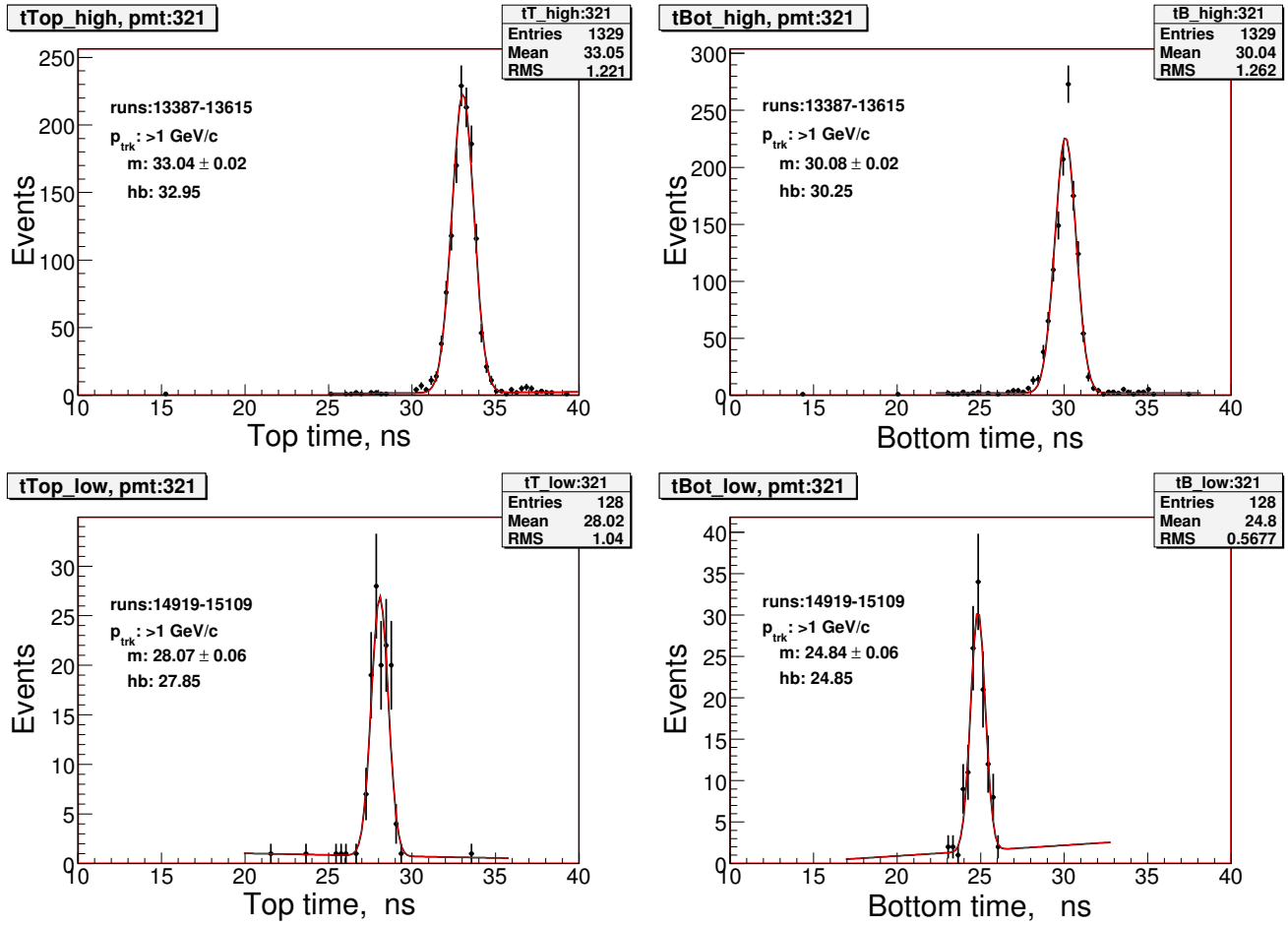
East pmt's without runs 13567-13599?

Q:If we drop runs 13567-13599, then East pmt's in early runs should be compatible with the following runs. Is it true?



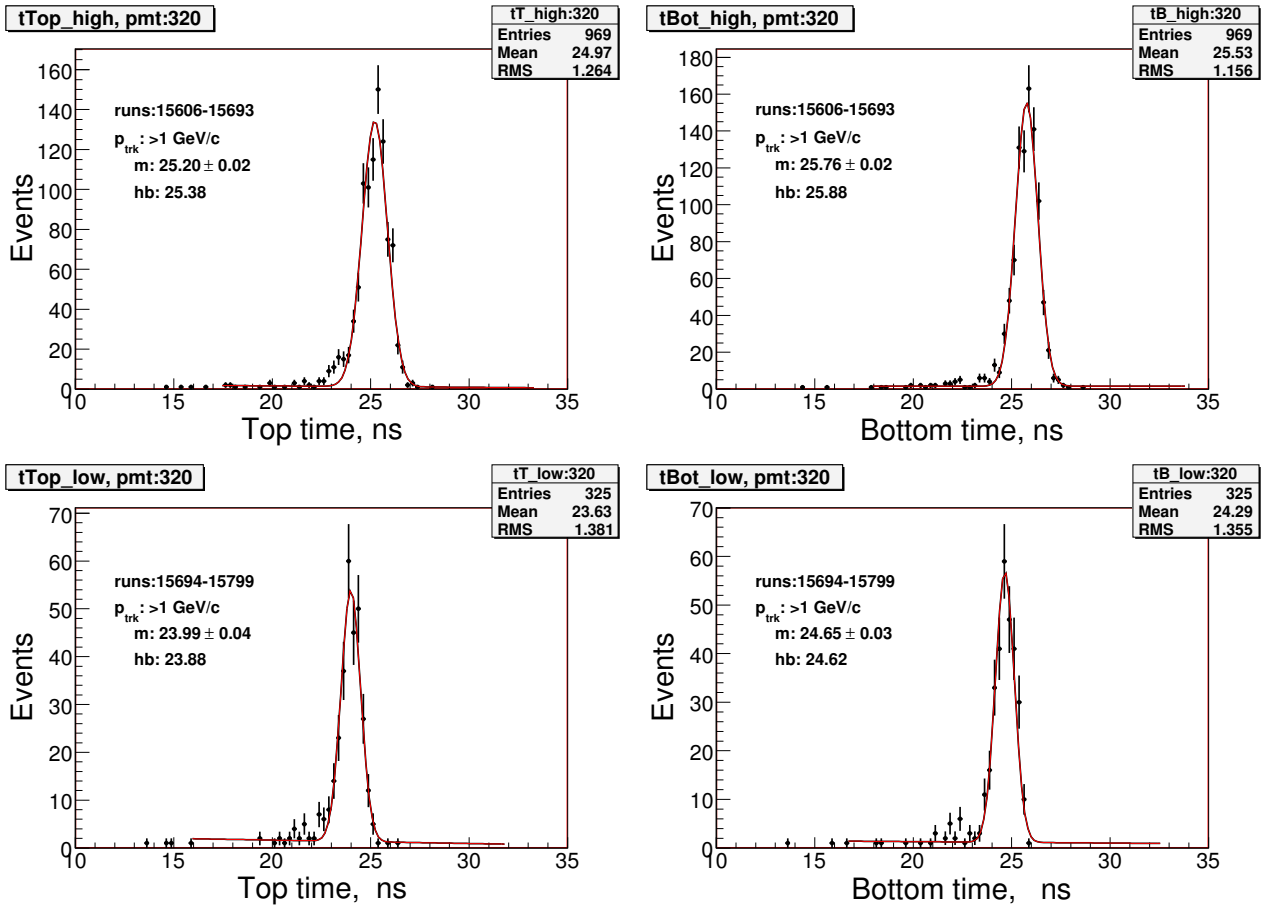
A: The top pmt time in 15XXX run numbers arrives by 3.3 ns earlier that for 135XX runs, for the bottom pmt's I see consistency. Is it possible that the temperature probe MCTEM2 not compatible for those time periods? Effect of fan?

What is about West pmt's?



A: According to Andre and Durga we should see about 3 ns time shift. But for the top pmt I see 6 ns and for the bottom pmt 5.2 ns shift. Effect of switching fan?

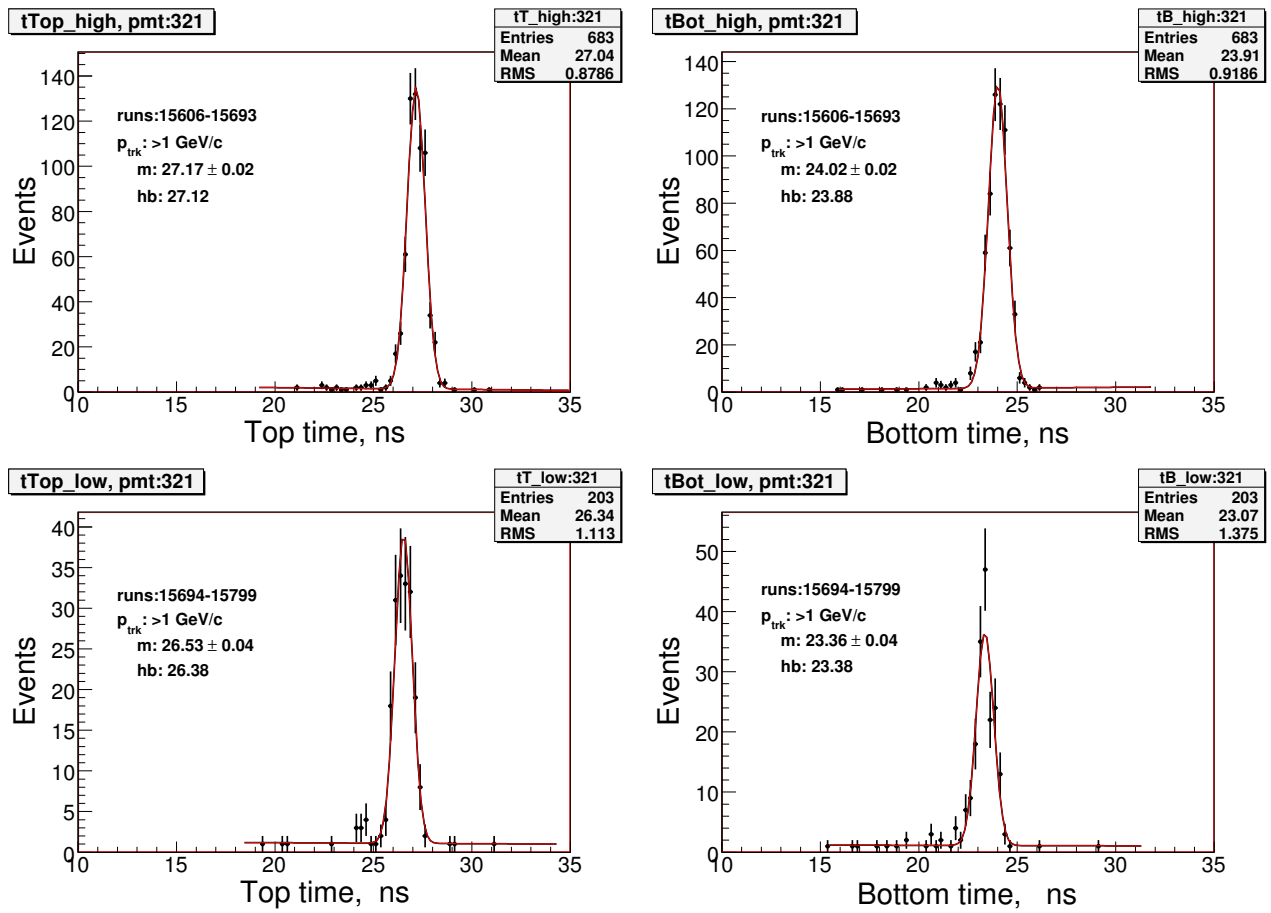
How HV change effecting the ToF TDC time?



Considering East pmt bar 320. Top plots - before HV change, bottom plots - after.

A: HV change from 800V to 880V reduced the Top pmt time by 1.2 ns, the bottom pmt time by 1.1 ns.

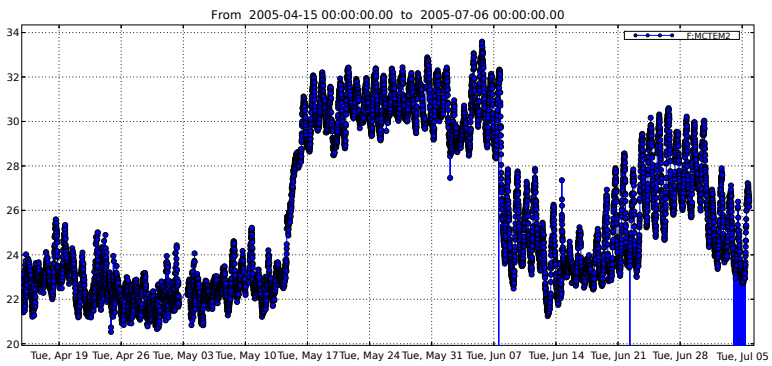
How HV change effecting the ToF TDC time? cont.

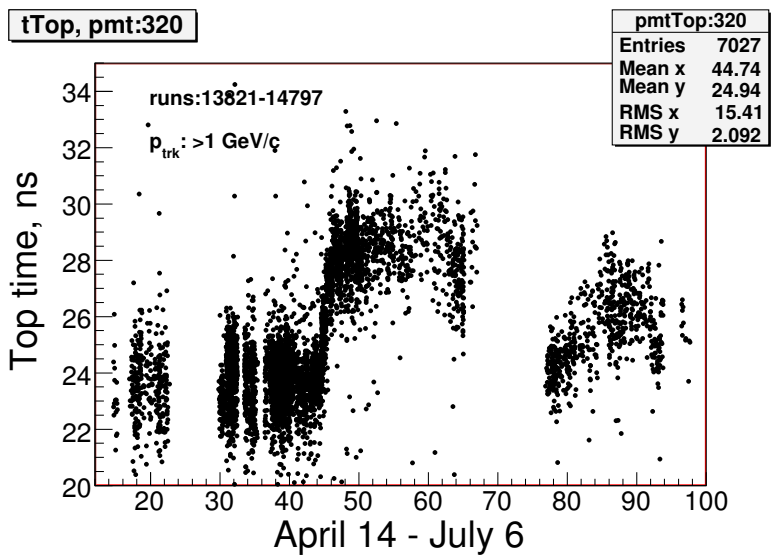


Considering West pmt bar 321. Top plots - before HV change, bottom plots - after.

A: HV change from 800V to 880V reduced the Top pmt time by 0.6 ns, the bottom pmt time by 0.7 ns. Calculations done for bars 301-340. No data available beyond these bars.

Temperature probe between run 13821 and run 14797

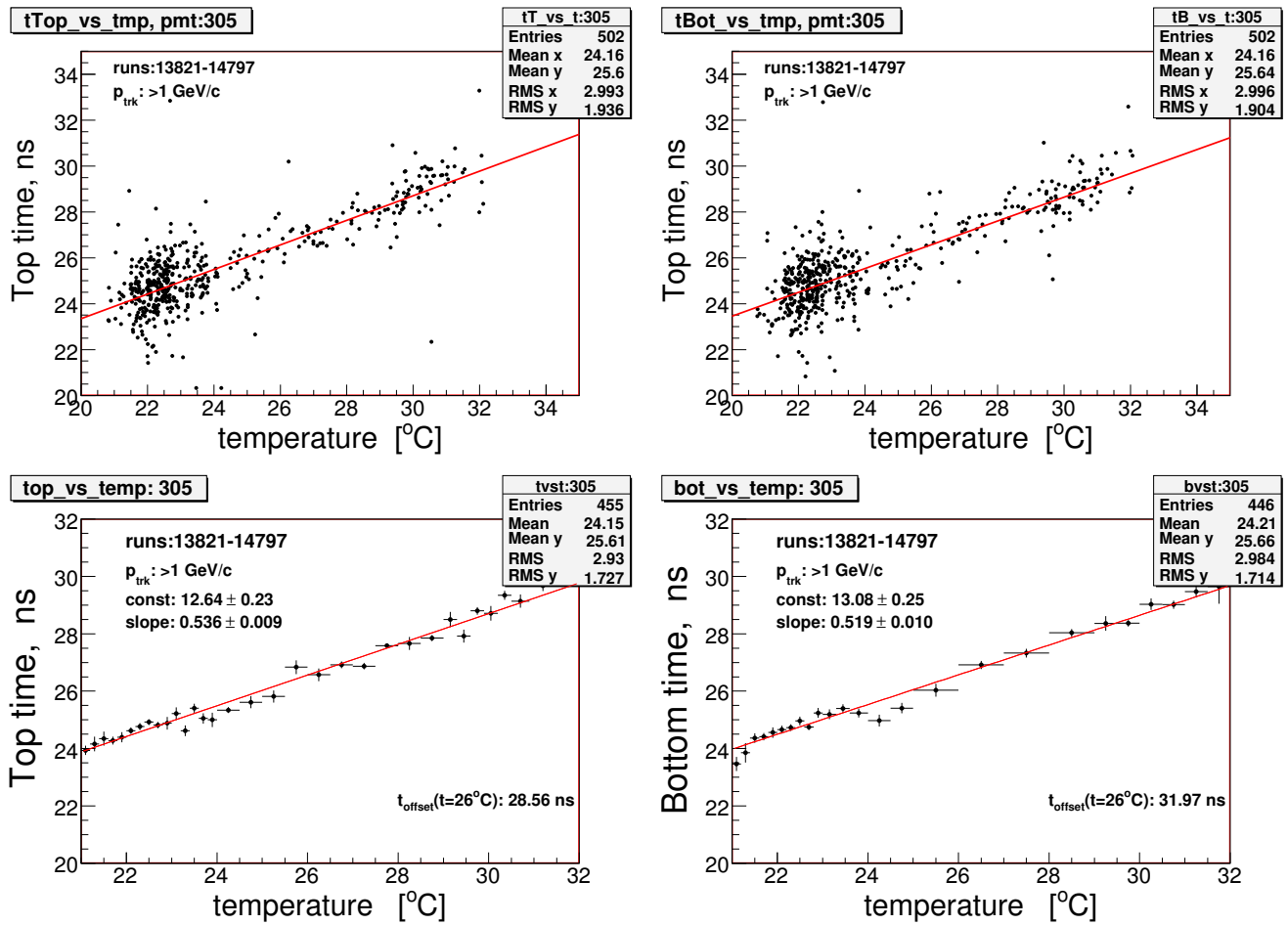




Top plot - the temperature probe between April 14 and July 6 2005. Data within these days can be used to make the ToF TDC time vs the temperature calibration. The oscillation of data points represents the day-night temperature changes.

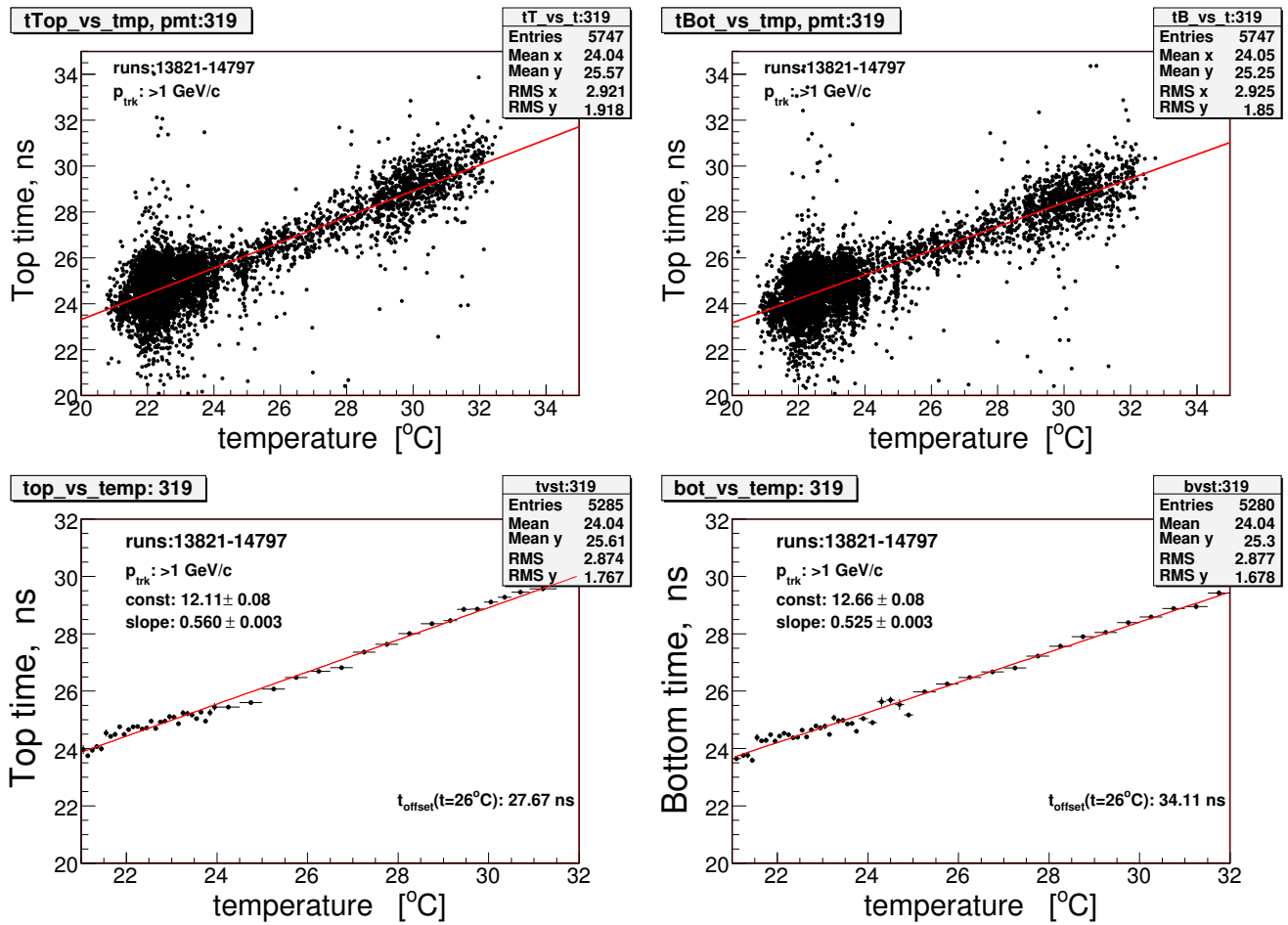
Bottom plot represents the ToF signal delay variations for the same data collecting days. We can see from these plots that ToF signal delay very well correlated with the temperature.

East bar 305



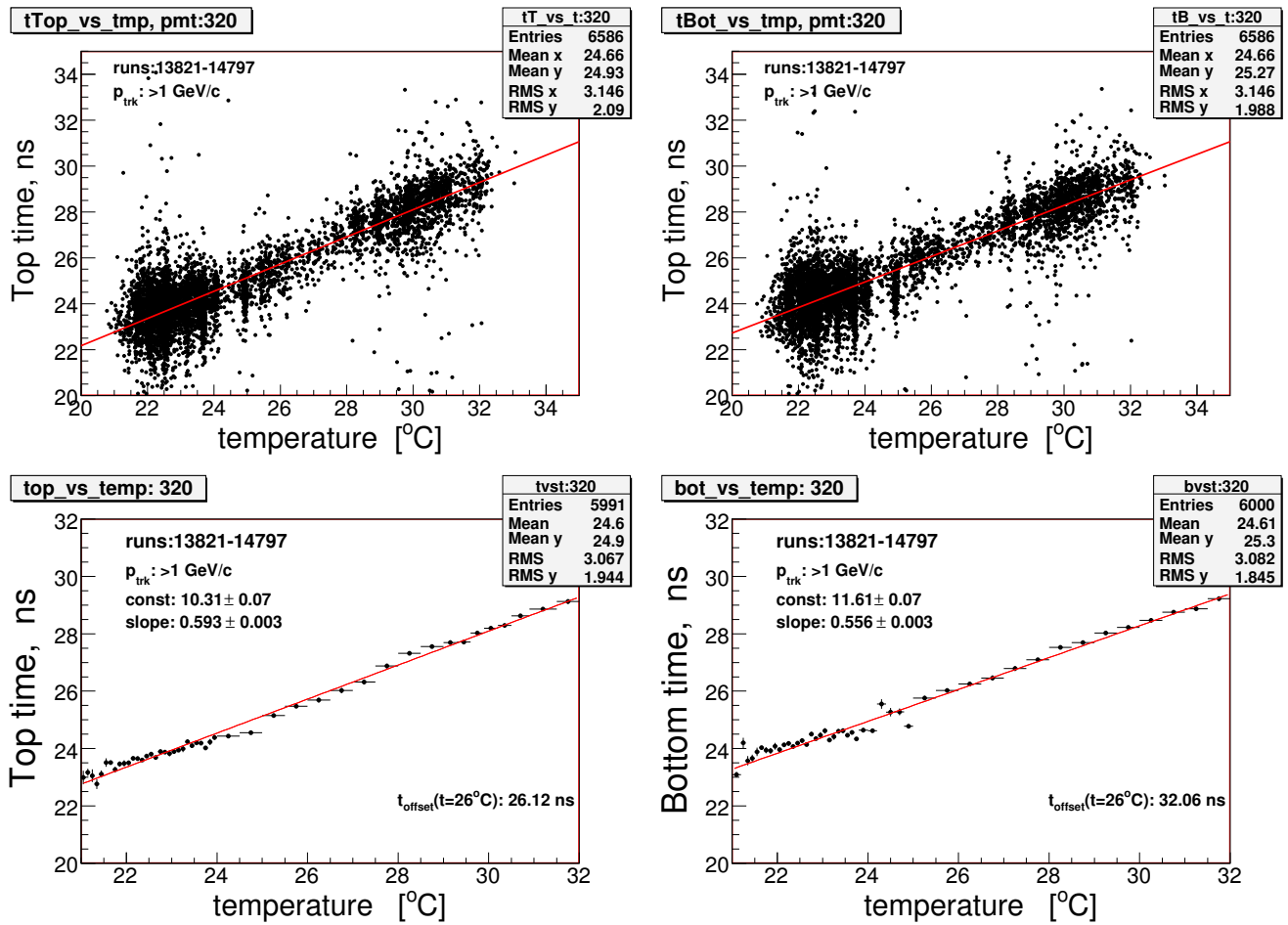
Top plots - bar 305 signal time delays vs the temperature. Bottom plots - fitted profiles for above data. Cuts: p_{tot} >1 GeV/c, tracks at center 0±10 cm, no hits in adjacent bars.

East bar 319



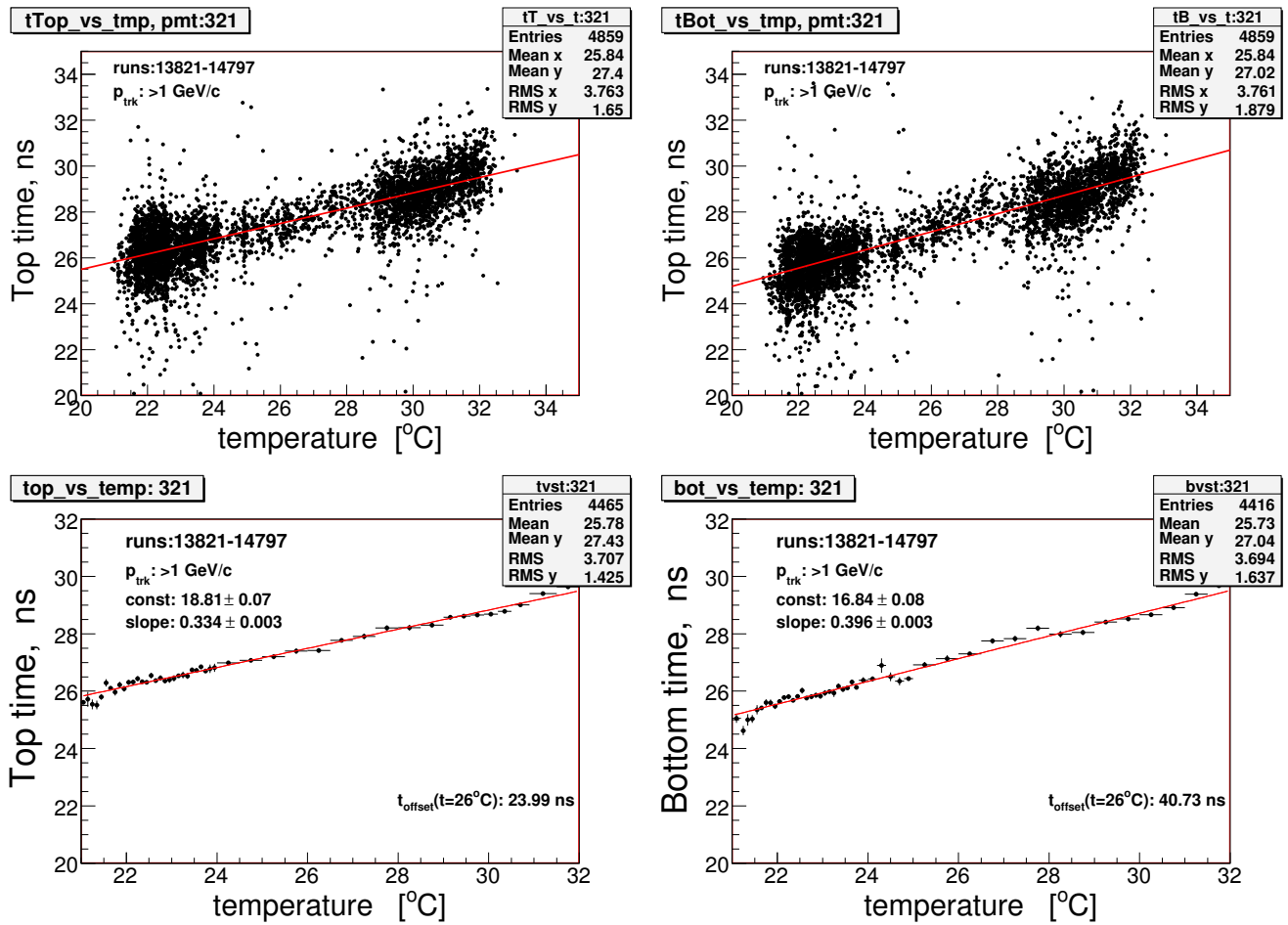
Top plots - bar 319 signal time delays vs the temperature. Bottom plots - fitted profiles for above data. Cuts: p_{tot} >1 GeV/c, tracks at center 0±10 cm, no hits in adjacent bars.

East bar 320, beam center



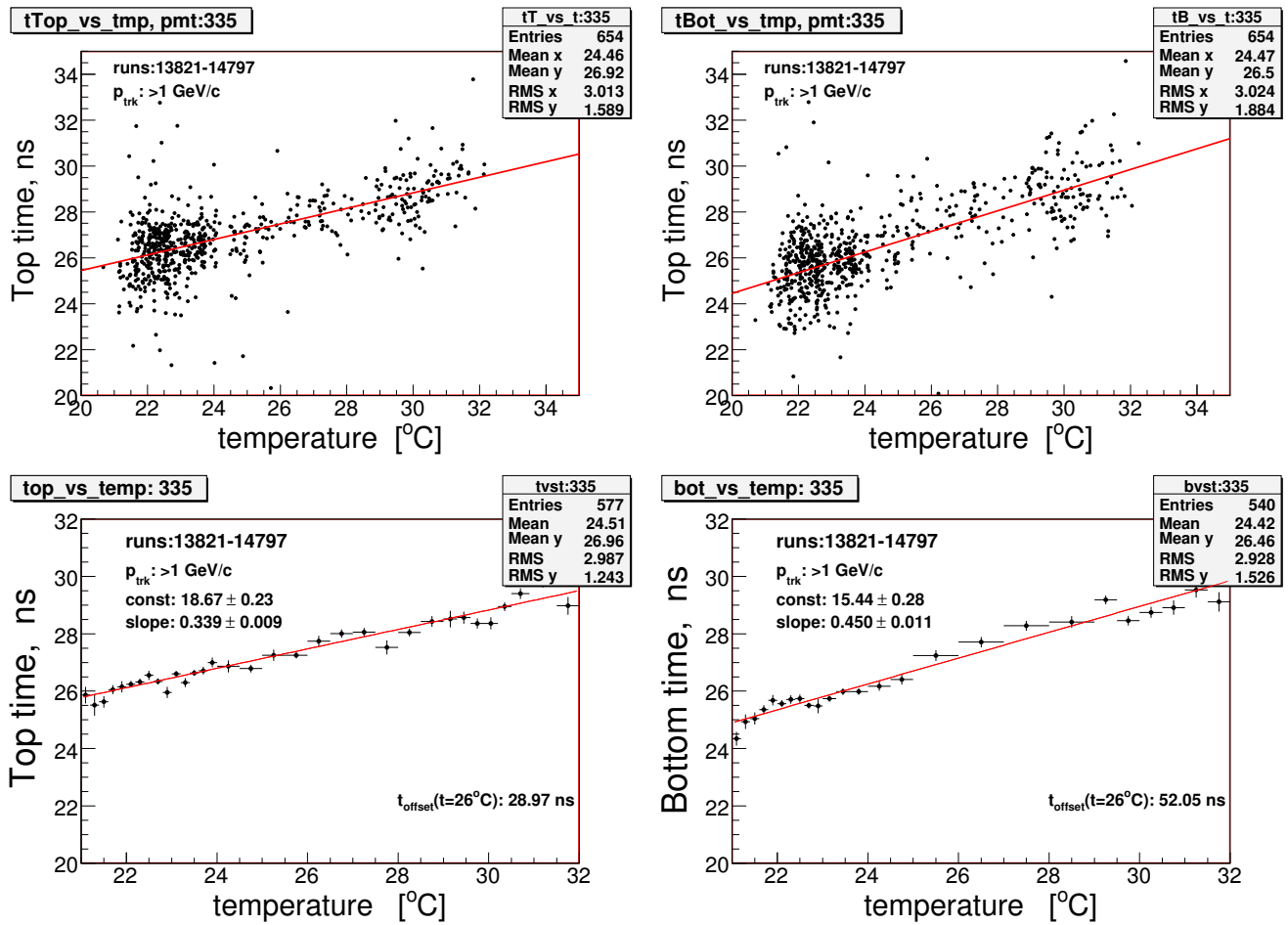
Top plots - bar 320 signal time delays vs the temperature. Bottom plots - fitted profiles for above data. Cuts: p_{tot} >1 GeV/c, tracks at center 0±10 cm, no hits in adjacent bars.

West bar 321



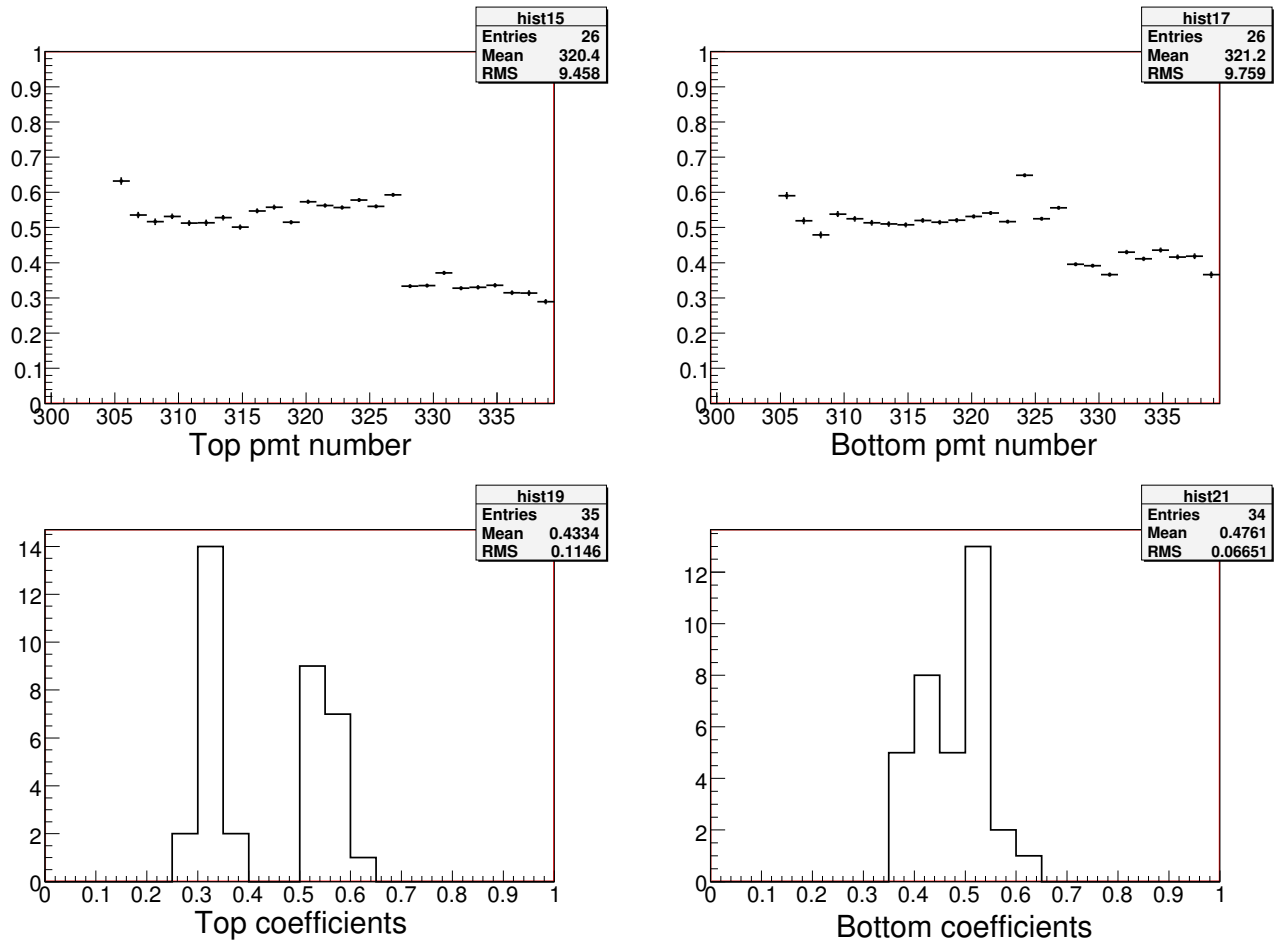
Top plots - bar 321 signal time delays vs the temperature. Bottom plots - fitted profiles for above data. Cuts: p_{tot} >1 GeV/c, tracks at center 0±10 cm, no hits in adjacent bars.

West bar 335



Top plots - bar 335 signal time delays vs the temperature. Bottom plots - fitted profiles for above data. Cuts: p_{tot} >1 GeV/c, tracks at center 0±10 cm, no hits in adjacent bars.

Summary for the temperature coefficients



The temperature coefficients can be divided in two groups: first group include bars 305-327, second - bars 328-340. Top is more distinguished, but bottom is less. Why?