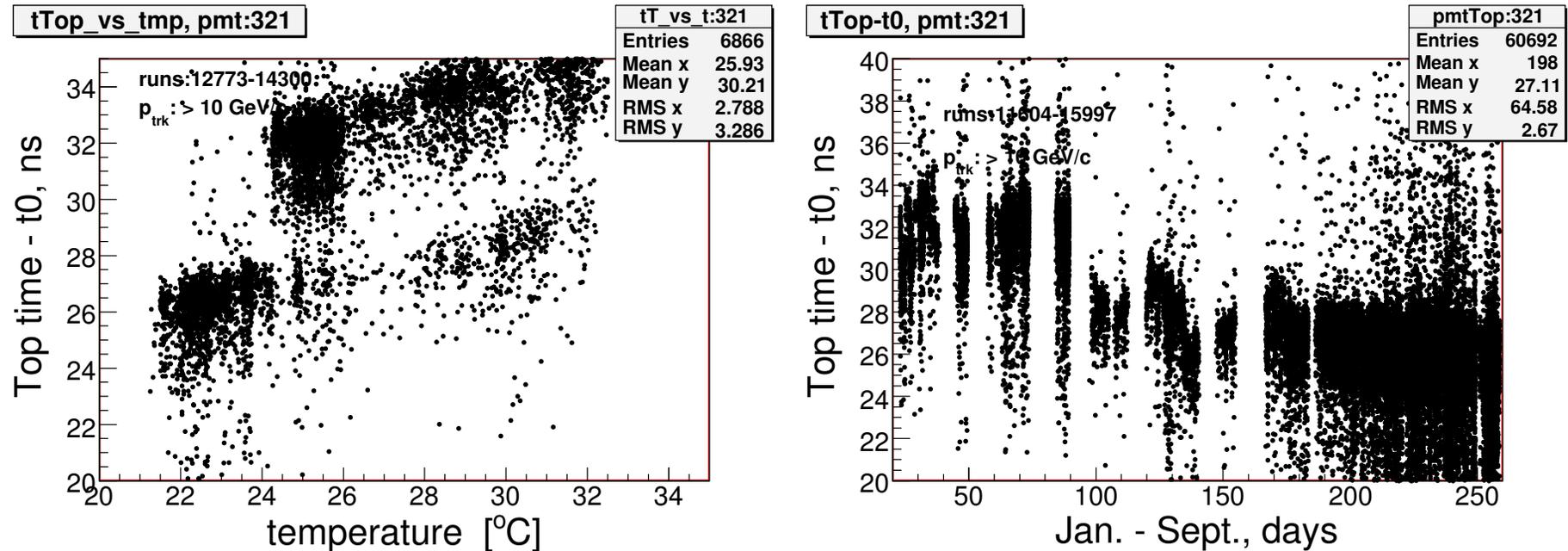


Reminder:

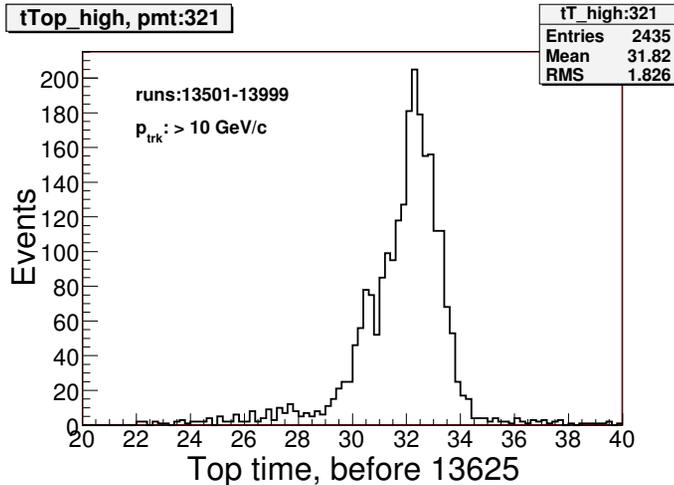
- the TDC values for the LH2 data in compare with the thin target data are differ by 6 ns for top and bottom pmt's on West side.
- bottom TDC on East side for LH2 data are quite similar to that the thin target data.
- top TDC on East side for LH2 data partially consistent and partially shifted by 4ns from the thin target data.

Bar 321 West side

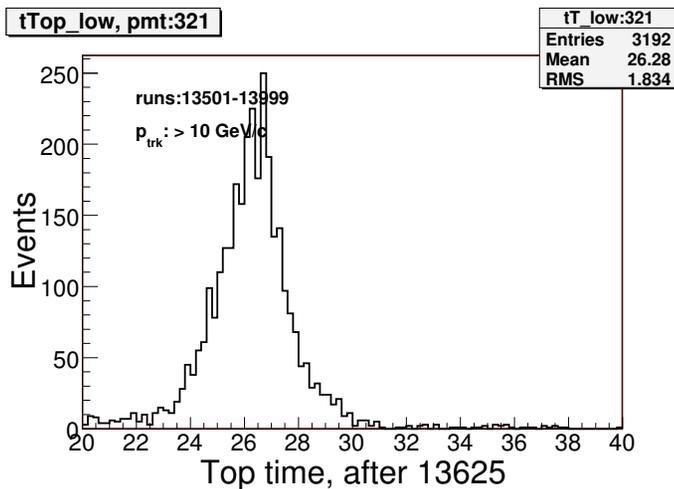


Left plot (reminder) - the time distributions vs the temperature probe for combined LH2 (full+Empty) and thin target data, runs 12773 - 14300. What is a reason for 6ns time jump? First of all try to find when it happens. So, I made the TDC time responses vs the calendar days plot - on right. Calendar days starts in January 20-th and ends in September 15-th 2005. Plot show that there is a time drop at 90-97. Log book tells: Thursday March 31 2005 12:18:30 by Andre Lebedev - "Durga and I did an access to look at TOF problems....The obvious changes because of that are additional 3ns delay on TDC signal, and 10ns earlier gate for ADC's." Nearest run number found to be 13625. Above note suggests that we should see an additional time delay, but what I see is quite opposite. Why?

Bar 321 West side, Top pmt

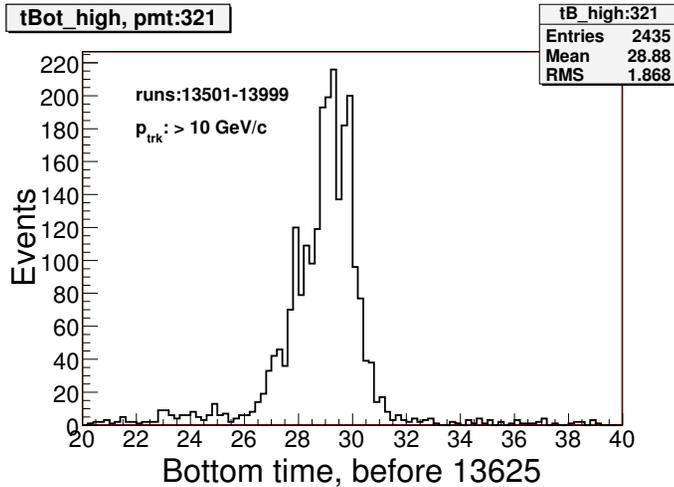


Top plot - the time distribution for Top pmt 321 with runs 13501-13624: before fixing the ToF problem.



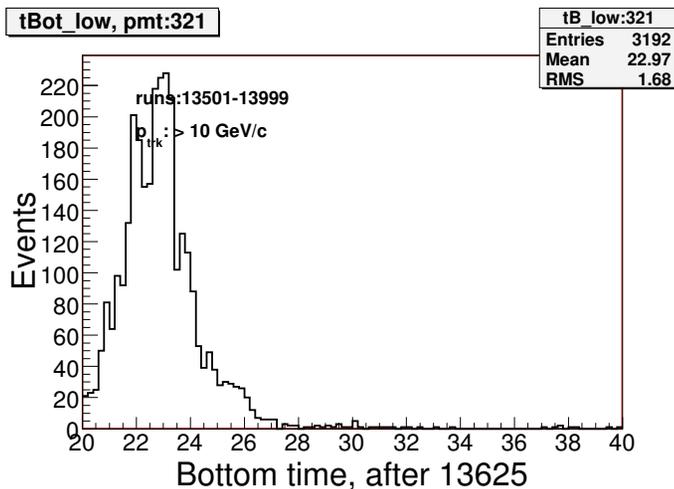
Bottom plot - the time distribution for Top pmt 321 with runs 13626-13999: after fixing the ToF problem. There is 6 ns time jump. Why 6 ns? According to Andre and Durga it should be 3 ns.

Bar 321 West side, Bottom pmt



Top plot - the time distribution for Bottom pmt 321 with runs 13501-13624: before fixing the ToF problem.

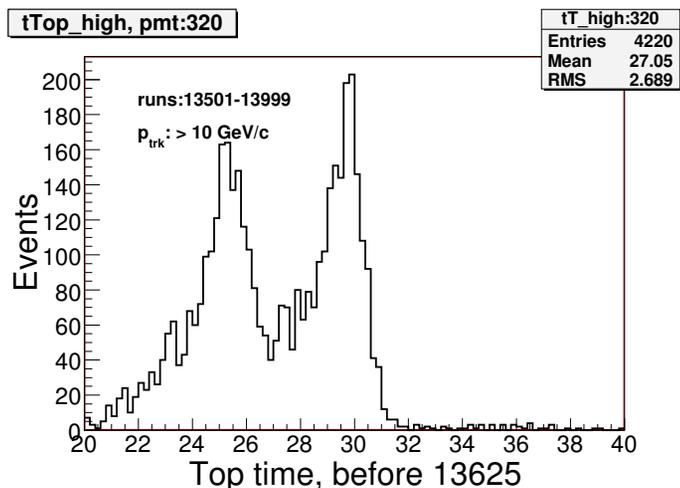
Bottom plot - the time distribution for Bottom pmt 321 with runs 13626- 13999: after fixing the ToF problem. There is 6 ns time jump.



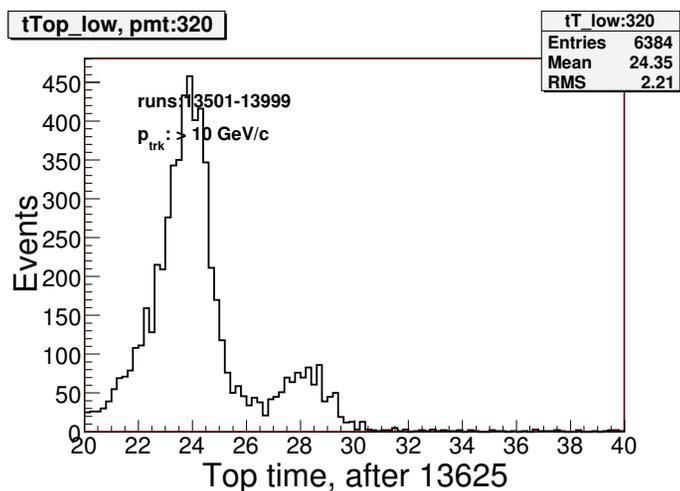
What to do to find the final time shift correction?

- reduce the time spread using the narrow beam spot,
- use high momentum tracks,
- within same temperature, right now they are on different temperatures
- reduce the “superluminals” if possible,
- use pass4aii, add the negative momentum data

Bar 320 East side, Top pmt



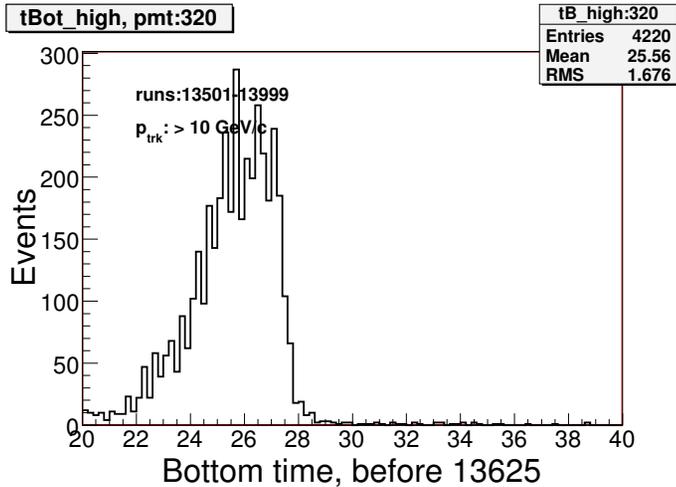
Top plot - the time distribution for Top pmt 320 with runs 13501-13624. Fixing ToF problem should not effect the East pmt's.



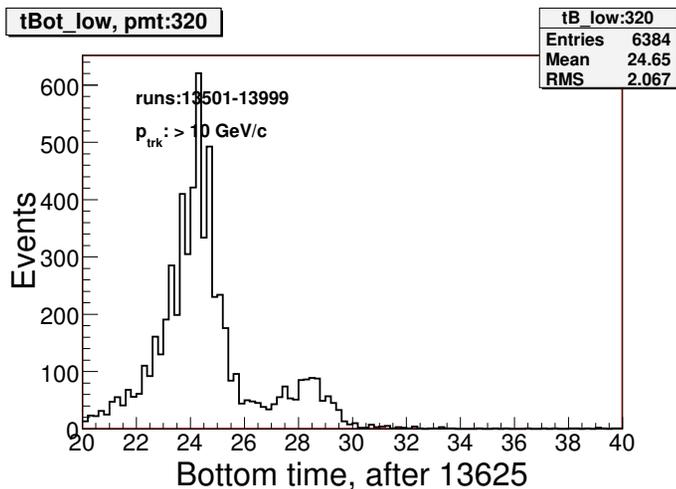
Bottom plot - the time distribution for Top pmt 320 with runs 13626- 13999.

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.

Bar 320 East side, Bottom pmt



Top plot - the time distribution for Bottom pmt 320 with runs 13501- 13624. Fixing ToF problem should not effect the East pmt's.



Bottom plot - the time distribution for Bottom pmt 320 with runs 13626- 13999.

Both plots indicates that there is a room for improvements.

ToF HV change

Holger found using slowmon db:

- HV was set to -800 until 2005-08-26 19:43:09
- HV was set to -880 after 2005-08-26 20:51:14 (for devname='M2C5-7')

From Logbook: by Nick Solomey - Friday August 26, 11:03.21:

Talked with Andrew Norman about the request of Carl R. this morning that we load the new TOF HV maps.

Andrew said the file tof-880.hv exists,.....

Friday August 26, 2005 20:58:45 by Chad Materniak:

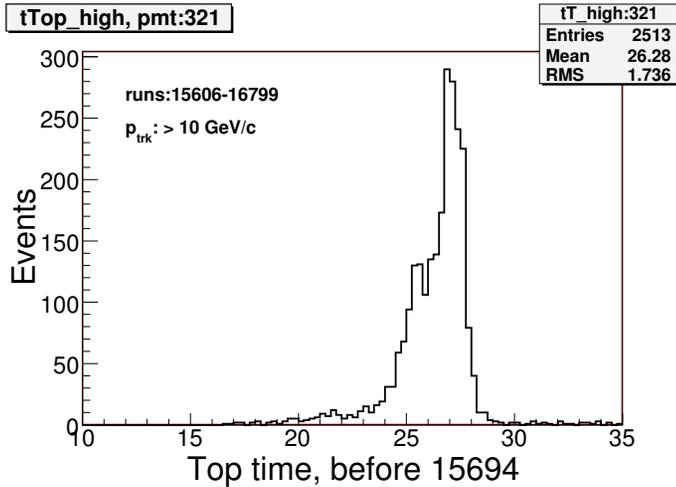
Shot setup started around 50 minutes ago. During the setup I loaded the new tof high voltage file (tof-880.hv)

Friday August 26, 2005 21:18:10 by Chad Materniak:

run 15694 is the first run with all TOF tubes at -880V

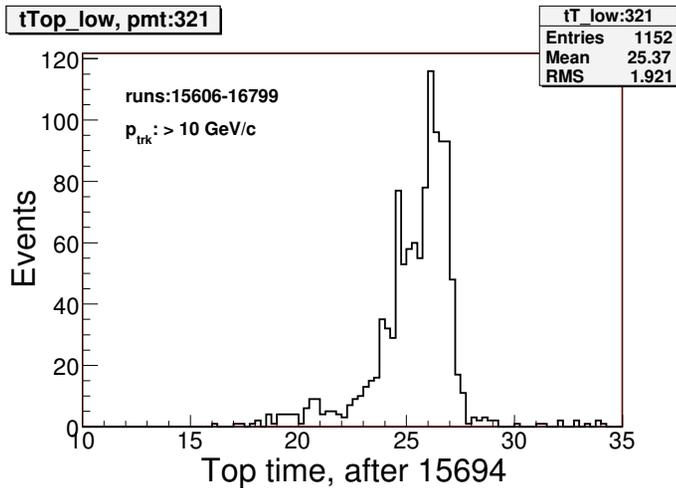
How HV change effected to the TDC time?

Bar 321 West side, Top pmt



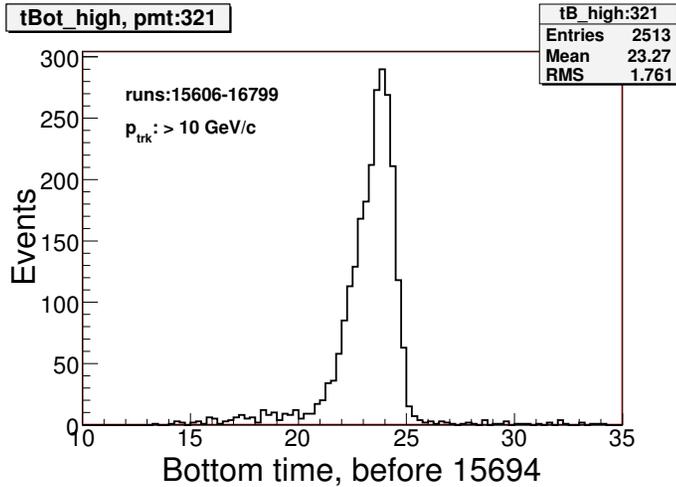
The temperature selected within 25.5 - 26.5^oC

Top plot - the time distribution for Top pmt 321 with runs 15606-15693: before HV change.



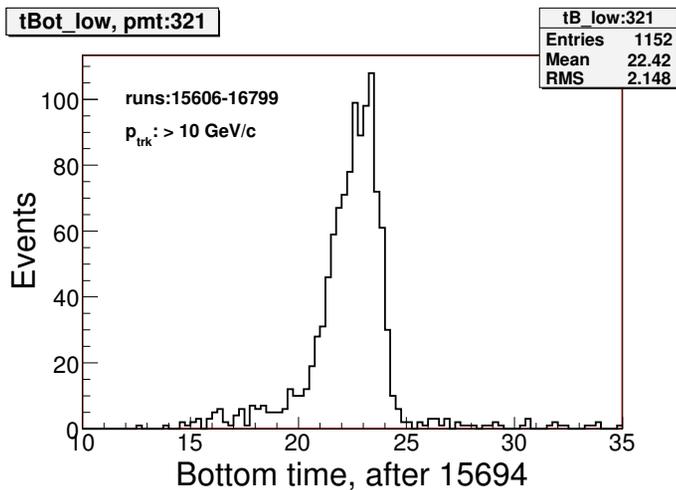
Bottom plot - the time distribution for Top pmt 321 with runs 15694-15799: after HV rise. There is about 0.9 ns time reduction.

Bar 321 West side, Bottom pmt



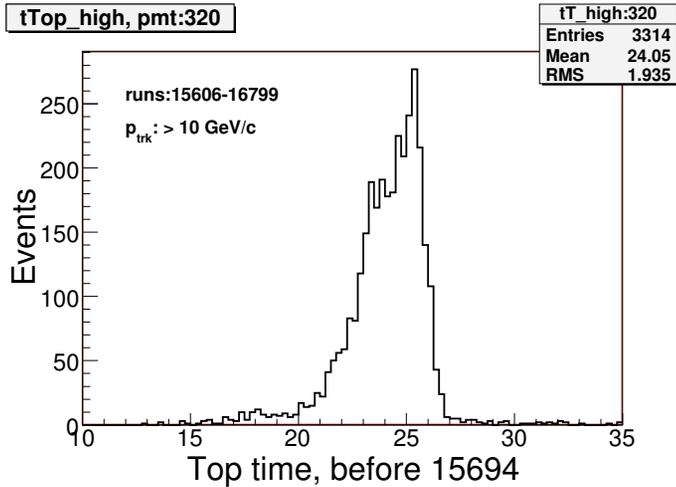
The temperature selected within 25.5 - 26.5^oC

Top plot - the time distribution for Bottom pmt 321 with runs 15606-15693: before HV change.



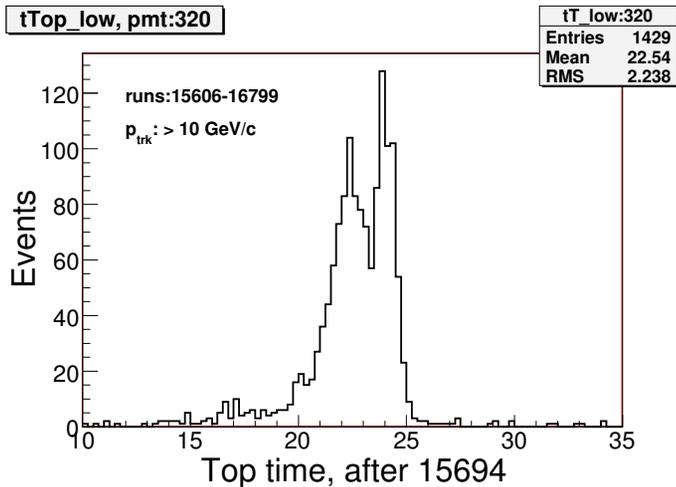
Bottom plot - the time distribution for Bottom pmt 321 with runs 15694-15799: after HV rise. There is about 0.9 ns time reduction.

Bar 320 East side, Top pmt



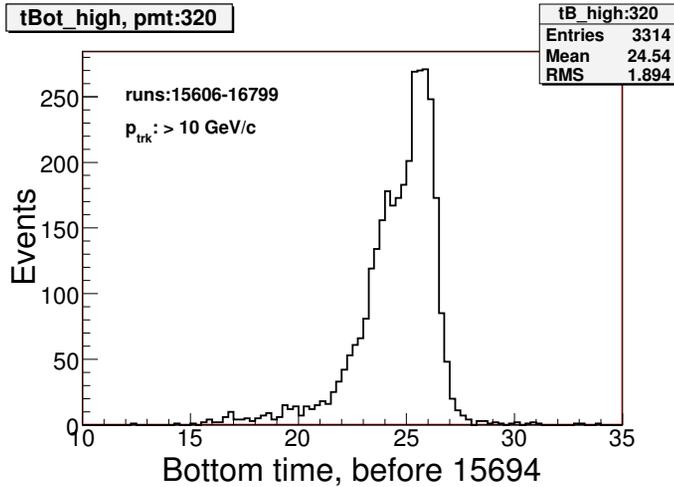
The temperature selected within 25.5 - 26.5^oC

Top plot - the time distribution for Top pmt 320 with runs 15606-15693: before HV change.



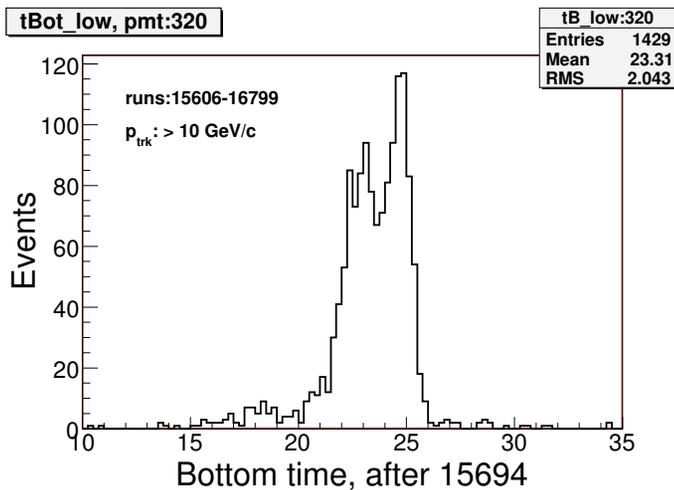
Bottom plot - the time distribution for Top pmt 320 with runs 15694-15799: after HV rise. There is about 1.5 ns time reduction.

Bar 320 East side, Bottom pmt



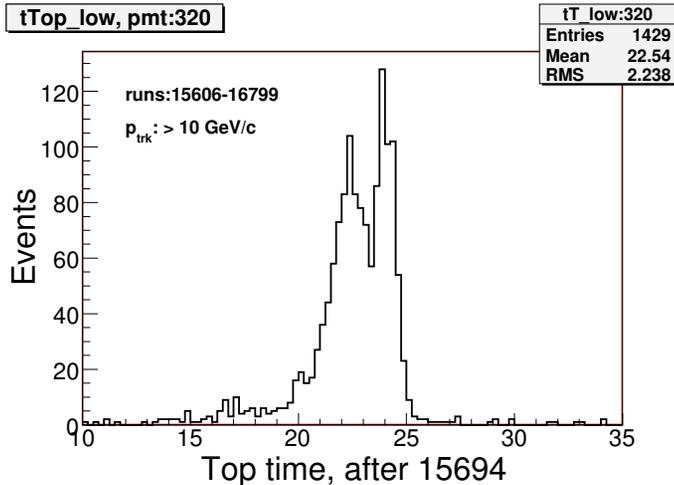
The temperature selected within 25.5 - 26.5^oC

Top plot - the time distribution for Bottom pmt 320 with runs 15606-15693: before HV change.



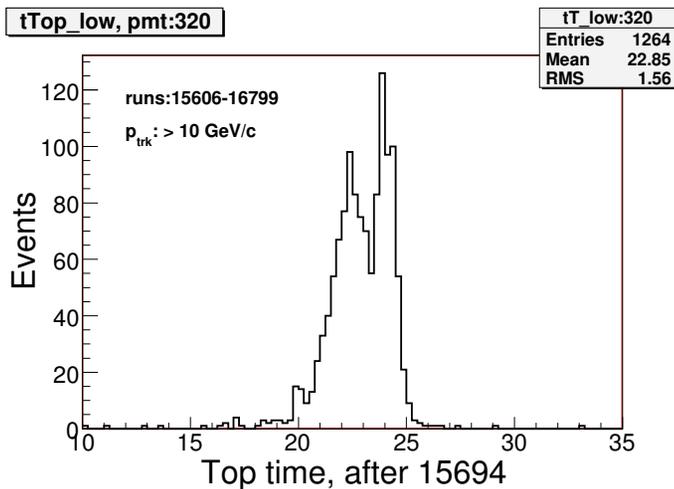
Bottom plot - the time distribution for Bottom pmt 320 with runs 15694-15799: after HV rise. There is about 1.2 ns time reduction.

one more attempt to reduce the “superluminals”



The temperature selected within 25.5 - 26.5°C
Same data for both plots, runs 15694-15799.

Top plot - the time distribution for Top pmt 320 without the Bottom-Top time difference vs the track Y-position correlation check.



Bottom plot - the time distribution for Top pmt 320 with the Bottom-Top time difference vs the track Y-position consistency check within ± 20 cm: $|\Delta t * 0.5 * SOL + C| < 20$ cm, where SOL is the speed of light in bar.