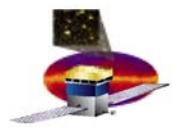


Muons from Flight SoftWare (= “FSW”)

- See my WorkShopSix presentation to understand the plots here.
- The point of these slides: FSW does indeed give the same TKR-to-CAL muon results as we had before with LATTE.
- Which means that both FSW (“online”) and the pipeline are picking up the right settings, calibration constants, et cetera.
- A small issue on two channels was found & fixed (not FSW’s fault). It was that the online hardware LAC settings got corrected but not the offline value used in `$LATCalibRoot/CAL/LAT/tholdci_16twr_01_25_2006.xml`



The data sample

For the “muon PSF” page:

9 runs,

six LAT 711 runs (077002497 to 2502)

three LAT 701 runs (077002503 to 2505)

(from April 5, 2006)

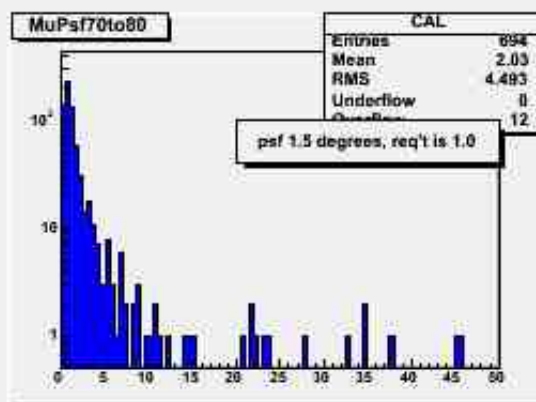
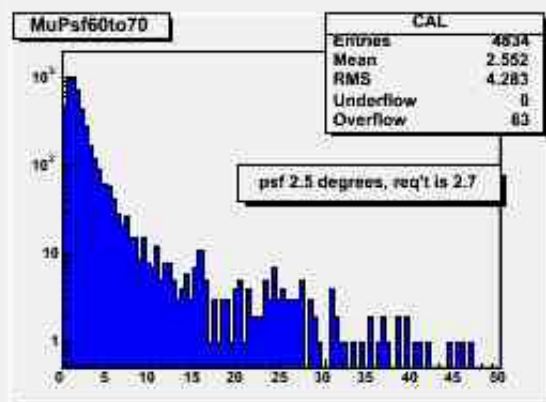
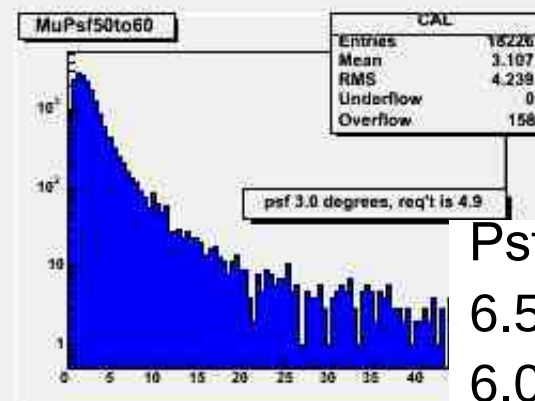
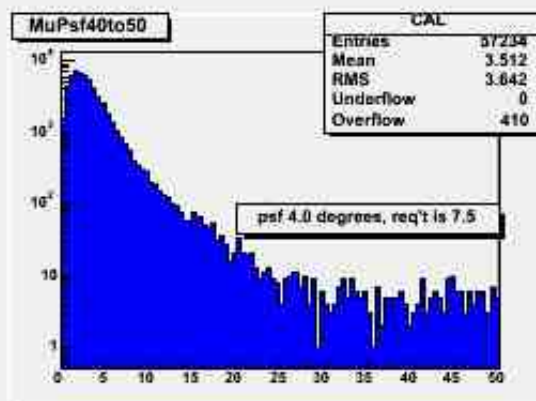
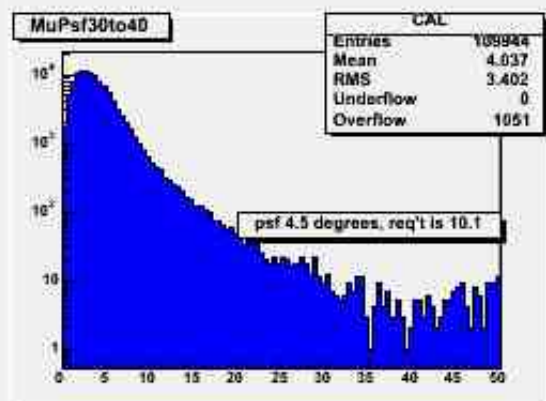
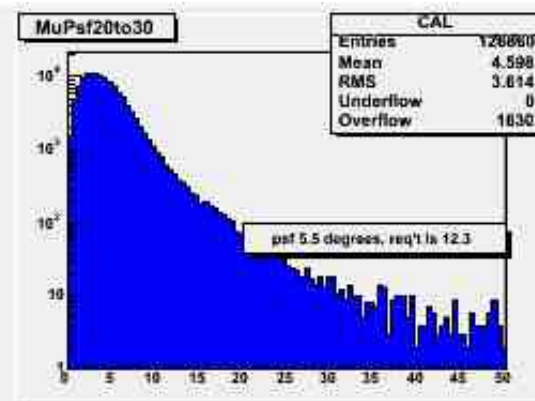
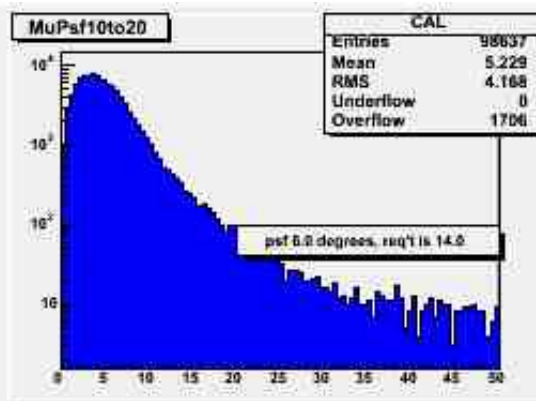
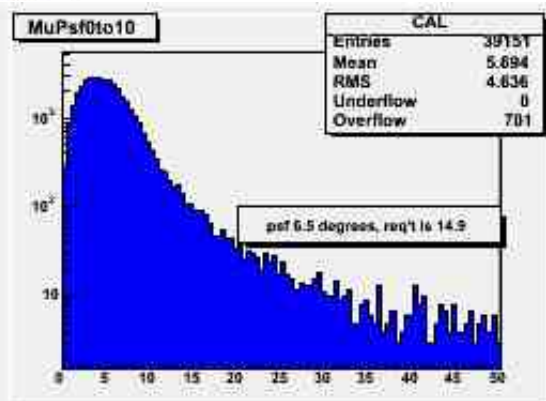
(I realized that I mixed 711 and 701 when I was writing this up. Shouldn't change anything.)

For the “energy per crystal” pages:

seven LAT 701 runs (077002485 to 2491)

(the idea was just to try some different files for the two jobs)

Nine 10° zenith angle intervals



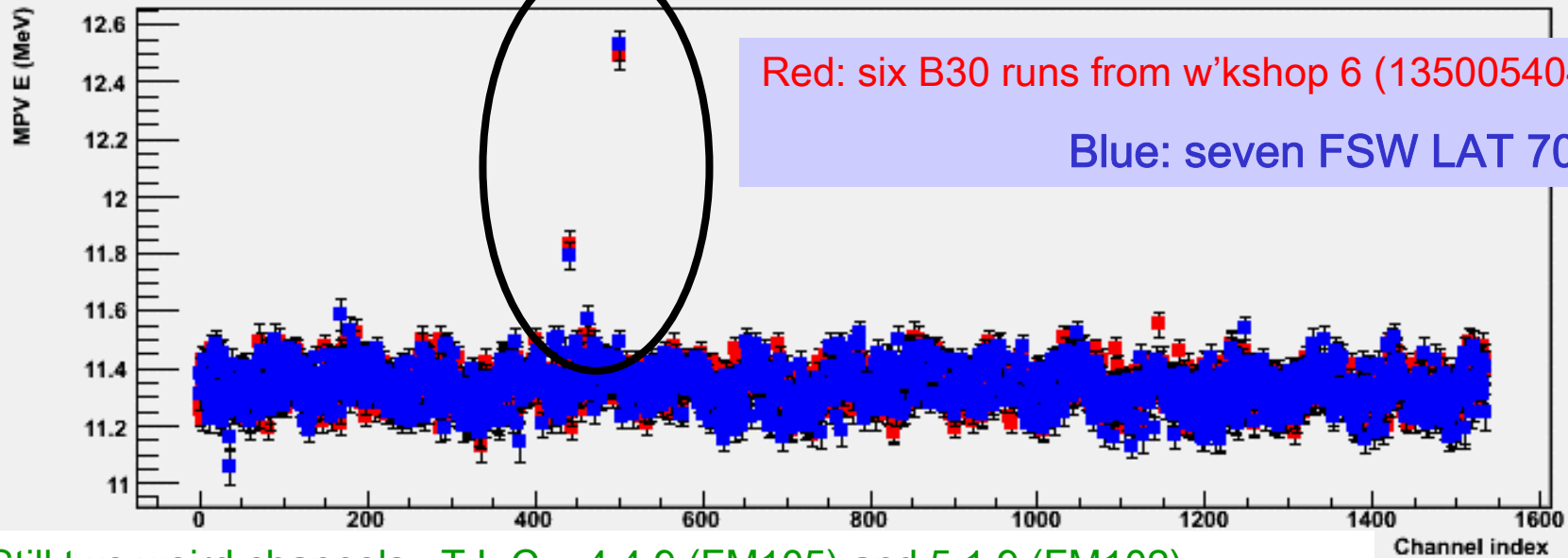
req't met:

Gets marginal beyond 70 degrees off axis.

Psf req	req't met
6.5	14.9
6.0	14.0
5.5	12.3
4.5	10.1
4.0	7.5
3.0	4.9
2.5	2.7
1.5	1.0

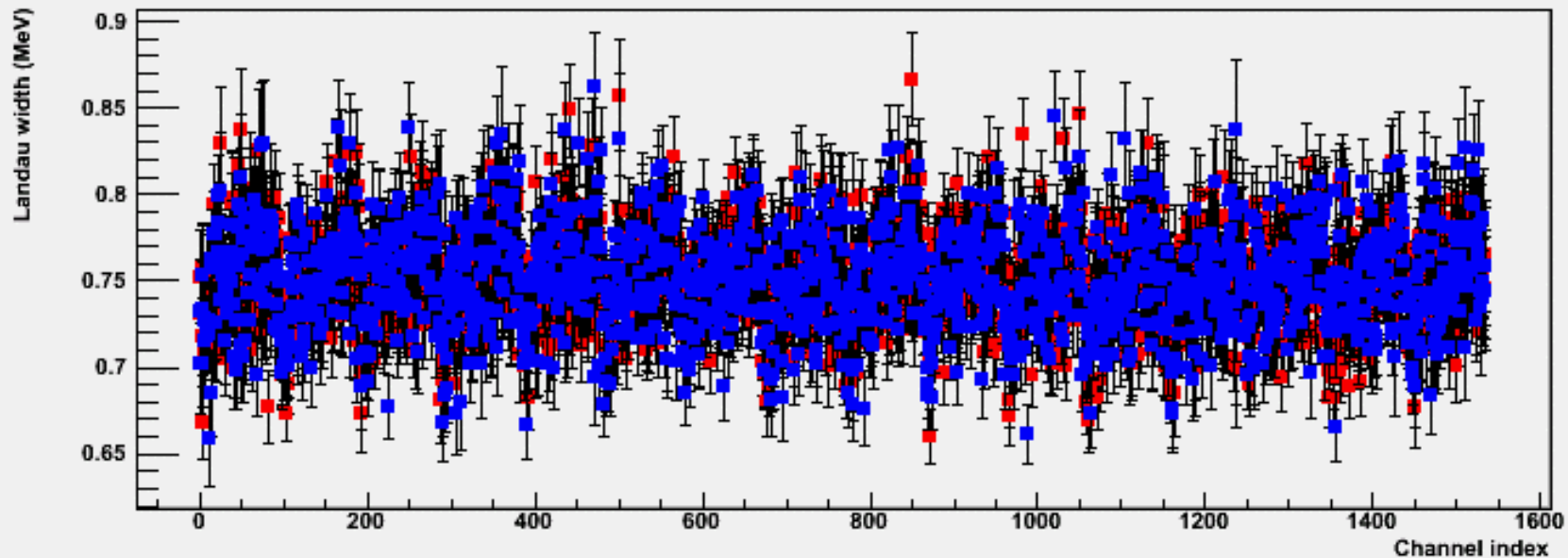
Energy deposit vs crystal

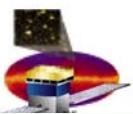
mean energy deposition



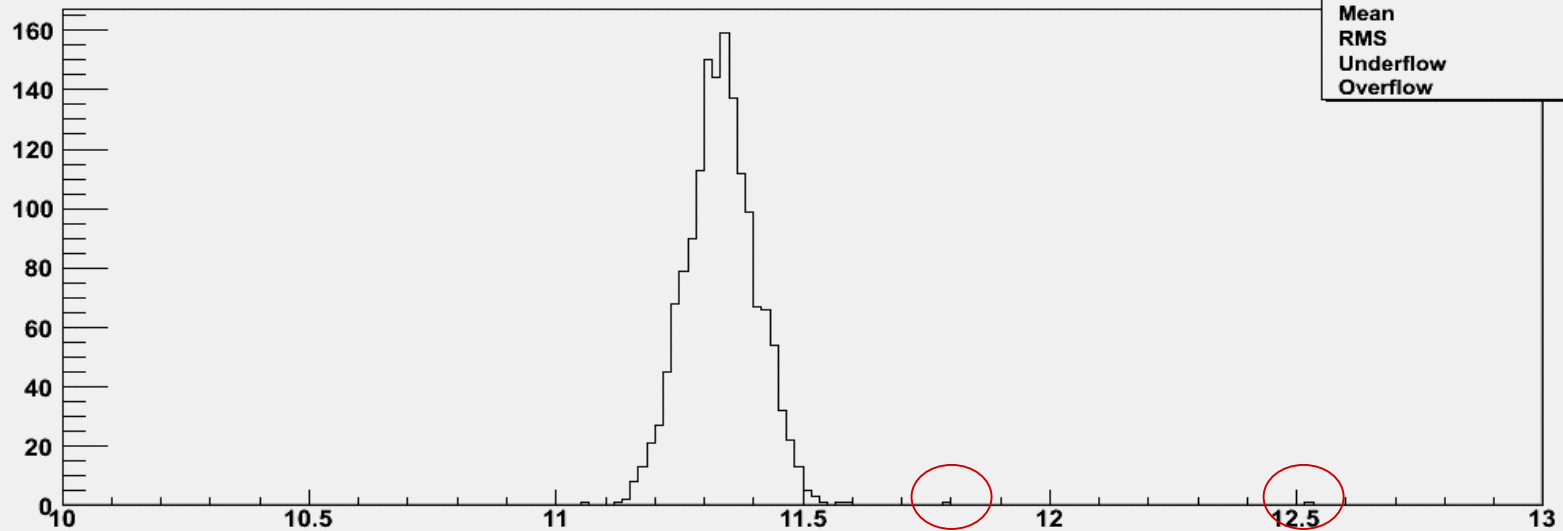
Still two weird channels, T L C = 4 4 9 (FM105) and 5 1 9 (FM102)

Width of Landau

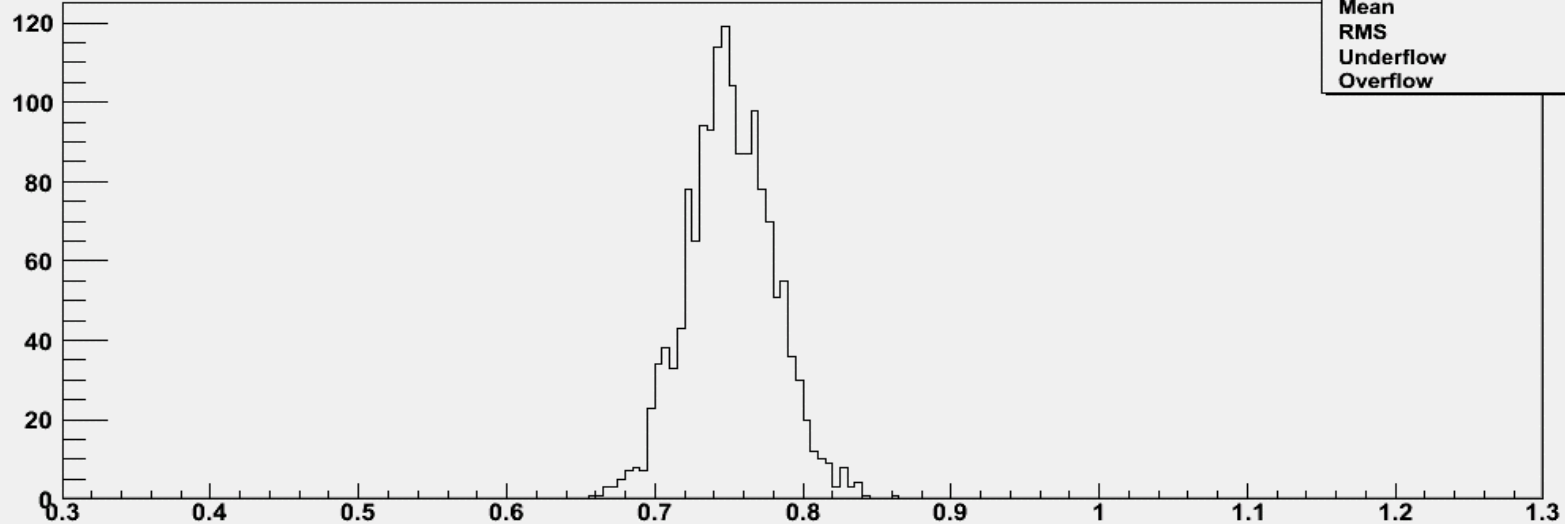




Energy deposit histograms

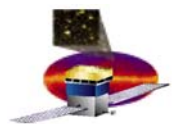
Energy Landau MPV

Empv	
Entries	1536
Mean	11.34
RMS	0.07751
Underflow	0
Overflow	0

Energy Landau width

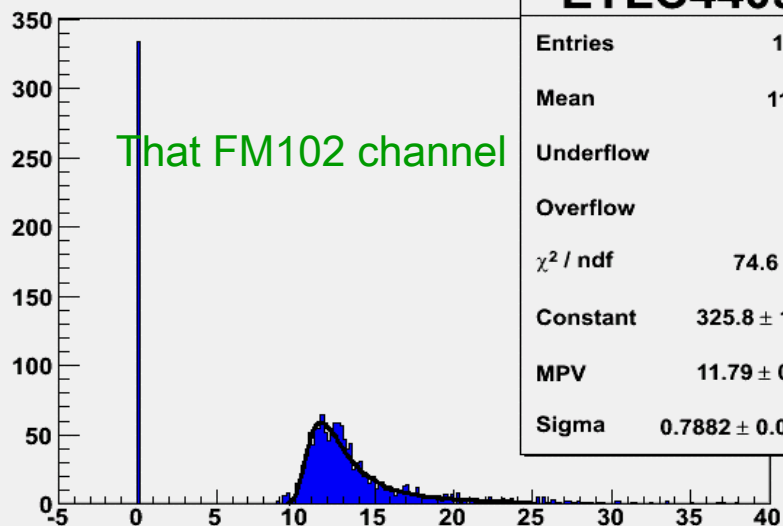
Ew	
Entries	1536
Mean	0.751
RMS	0.02938
Underflow	0
Overflow	0

FSW gives same result as January Latte



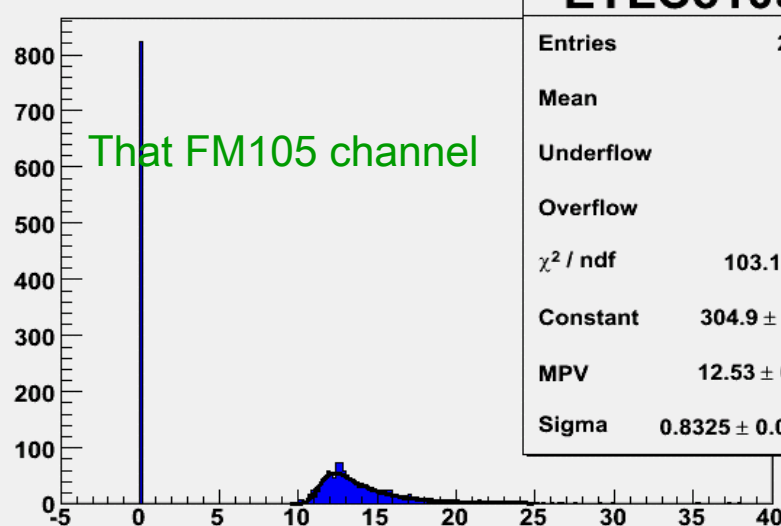
Those 2 renegade channels (here, FSW)

ETLC4409

**ETLC4409**

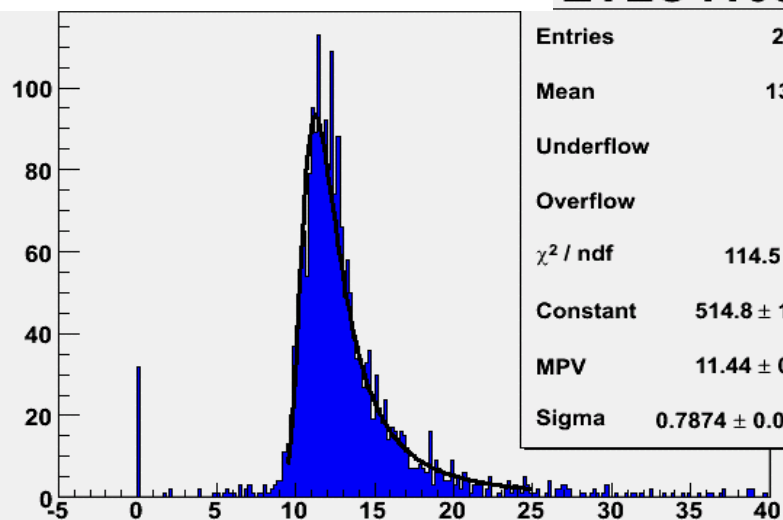
Entries	1650
Mean	11.17
Underflow	0
Overflow	4
χ^2 / ndf	74.6 / 69
Constant	325.8 ± 13.9
MPV	11.79 ± 0.05
Sigma	0.7882 ± 0.0271

ETLC5109

**ETLC5109**

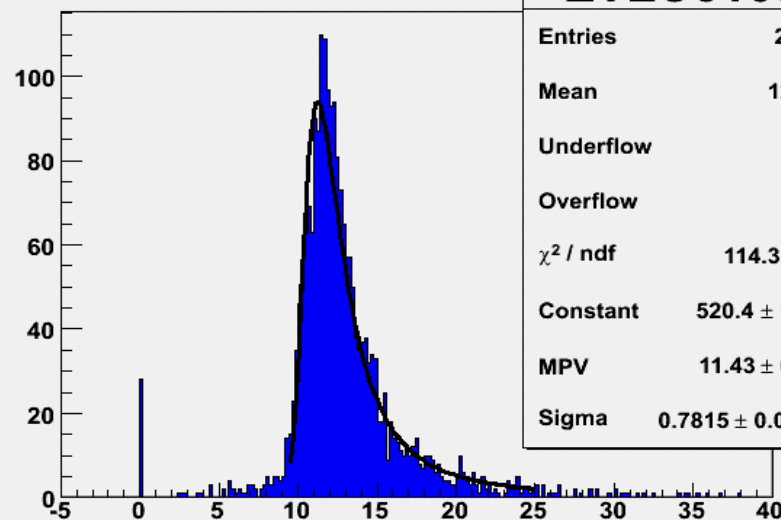
Entries	2151
Mean	8.98
Underflow	0
Overflow	14
χ^2 / ndf	103.1 / 72
Constant	304.9 ± 15.1
MPV	12.53 ± 0.05
Sigma	0.8325 ± 0.0372

2 normal channels, SVAC tuple

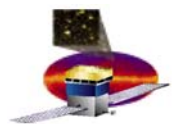
ETLC4109

Entries	2132
Mean	13.17
Underflow	0
Overflow	5
χ^2 / ndf	114.5 / 71
Constant	514.8 ± 17.5
MPV	11.44 ± 0.04
Sigma	0.7874 ± 0.0218

ETLC6109

**ETLC6109**

Entries	2159
Mean	12.97
Underflow	0
Overflow	12
χ^2 / ndf	114.3 / 74
Constant	520.4 ± 17.5
MPV	11.43 ± 0.04
Sigma	0.7815 ± 0.0214

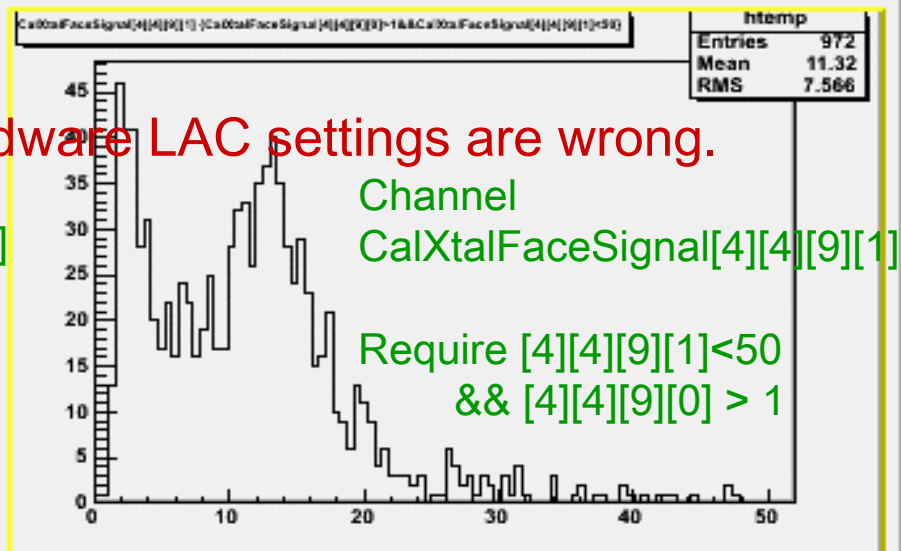
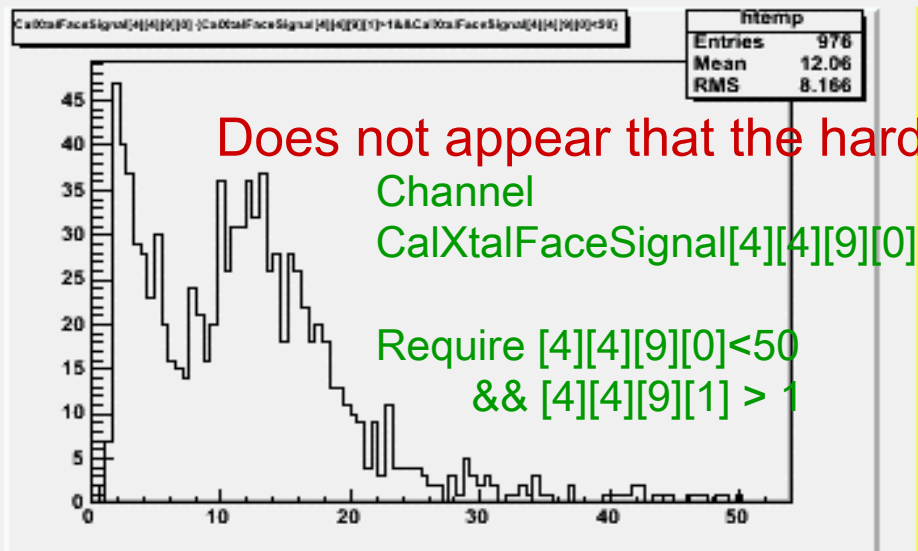
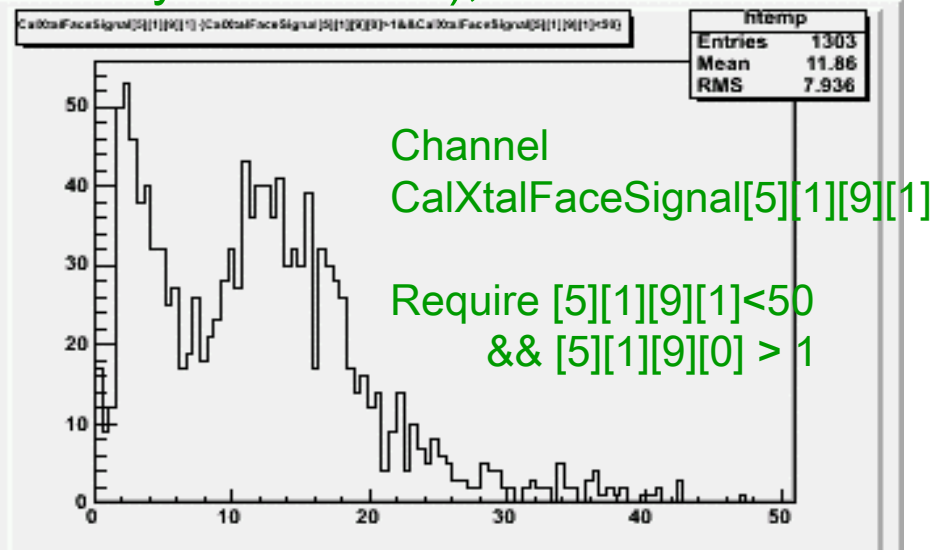
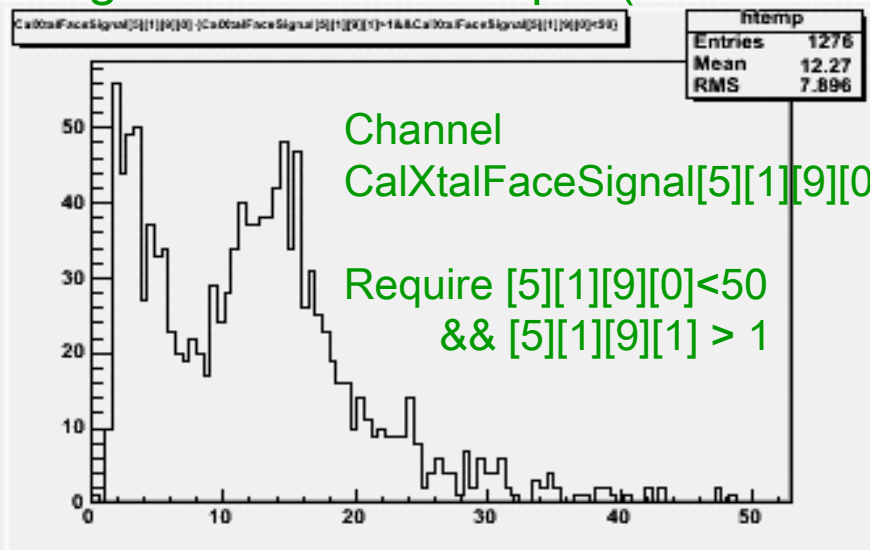


But Anders said LAC's fixed, and

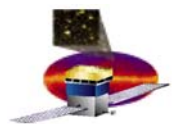
Anders is right (as usual)

Run 077002486

Straight from the CalTuple (uncontaminated by Dave code), for LAT 701 run.

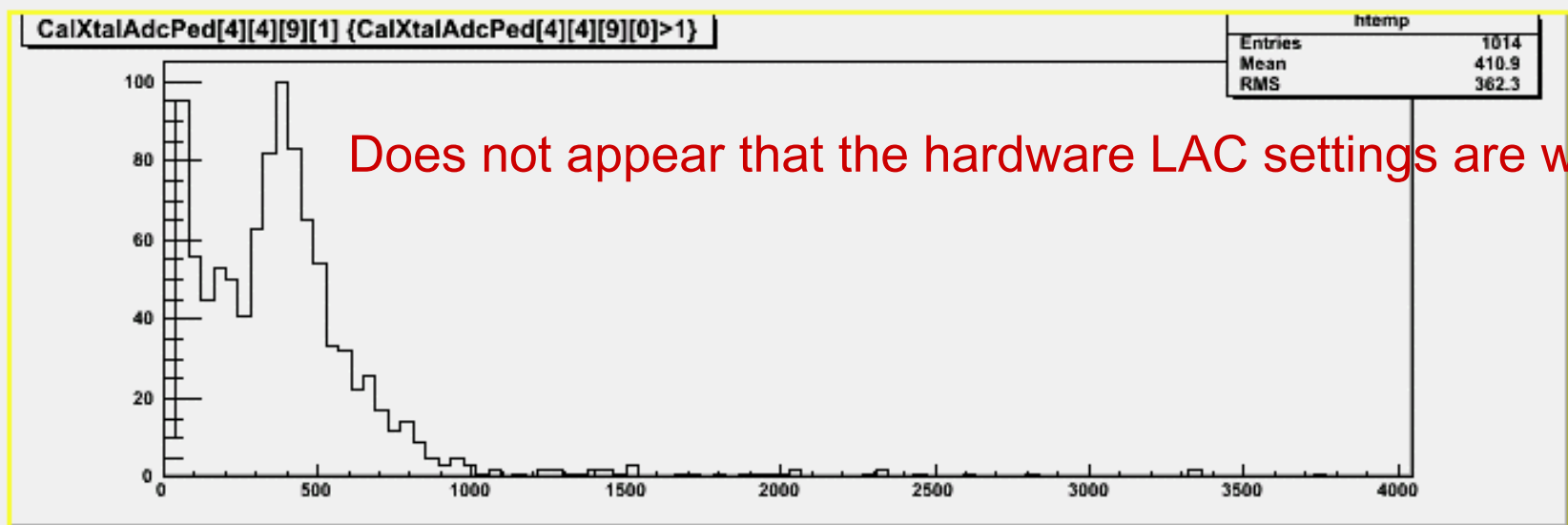
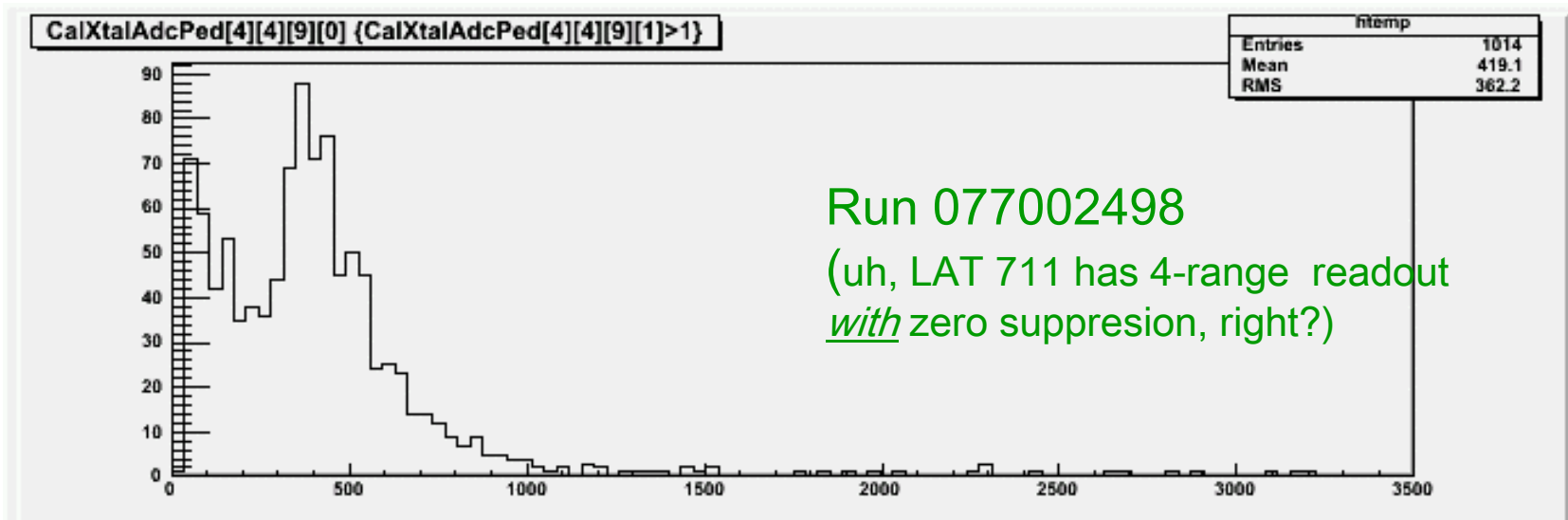


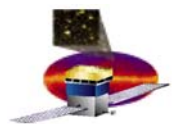
Does not appear that the hardware LAC settings are wrong.



LAT 711 used to be B30

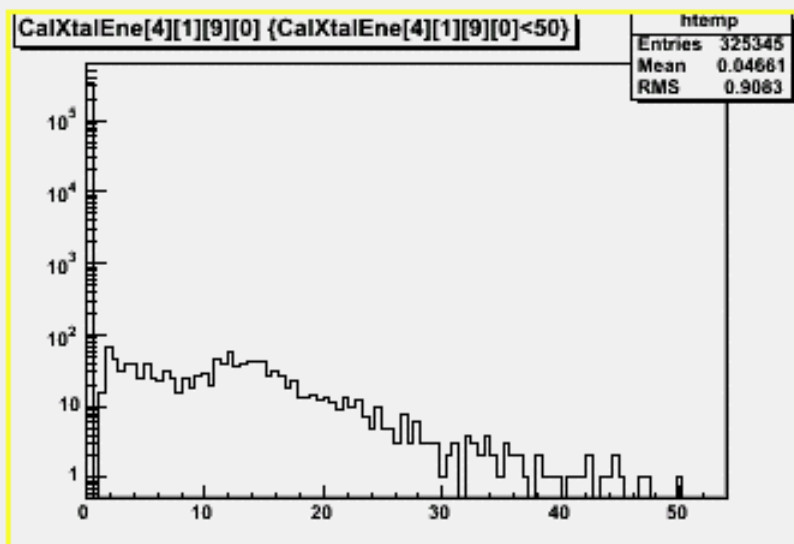
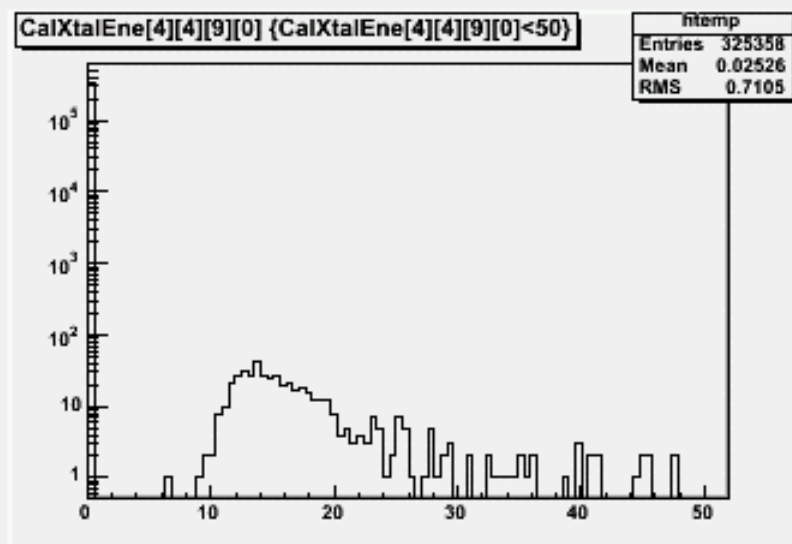
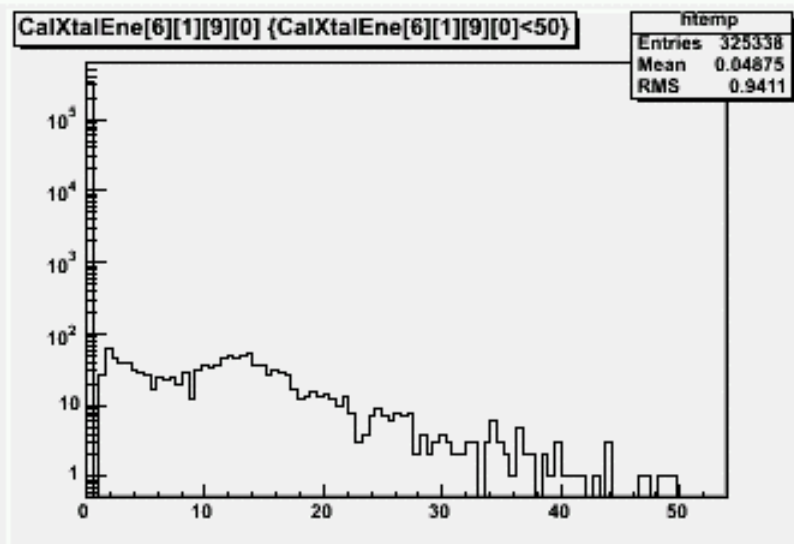
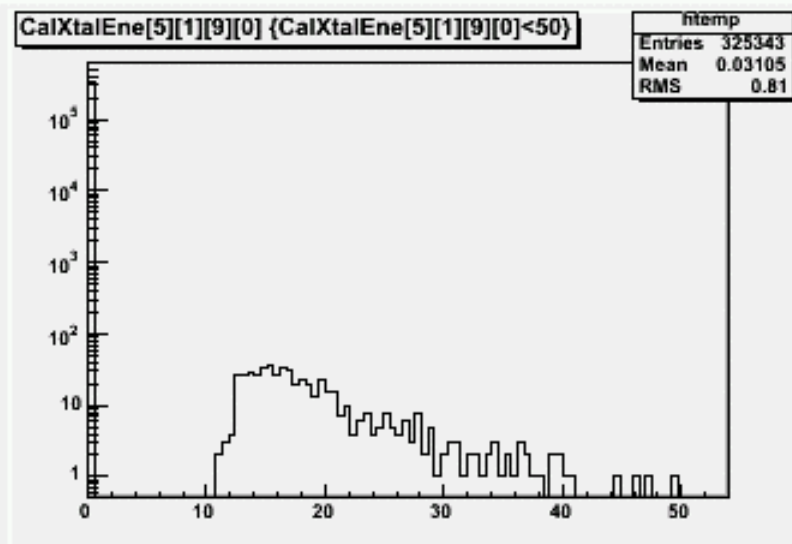
Straight from the CalTuple (uncontaminated by Dave code), for LAT 711 run.

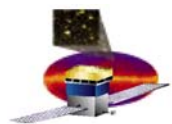




LAC looks okay in CalTuple, so how about in SVAC Tuple?

YIKES! Looks like CalXtalResponse applies a cut to these two channels.

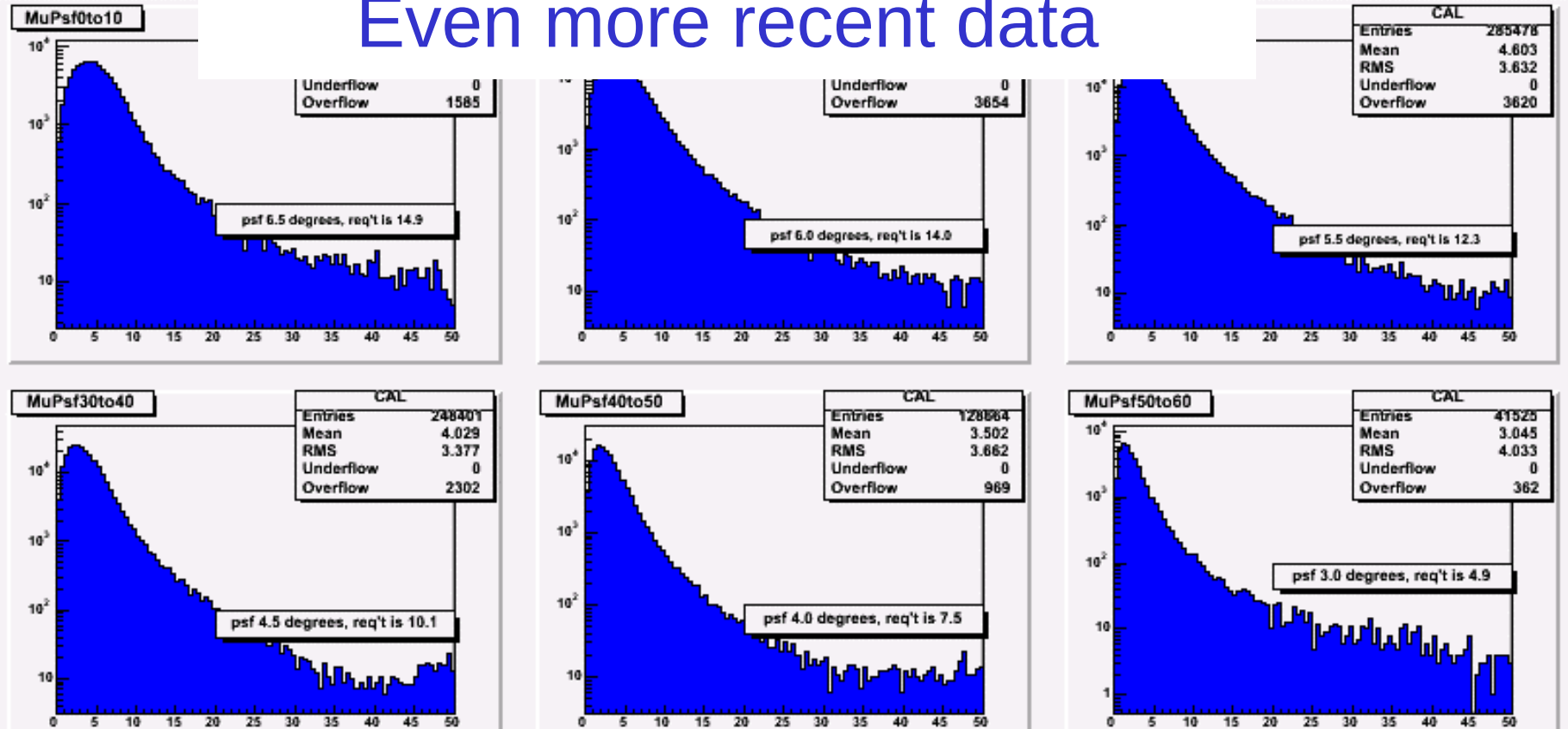




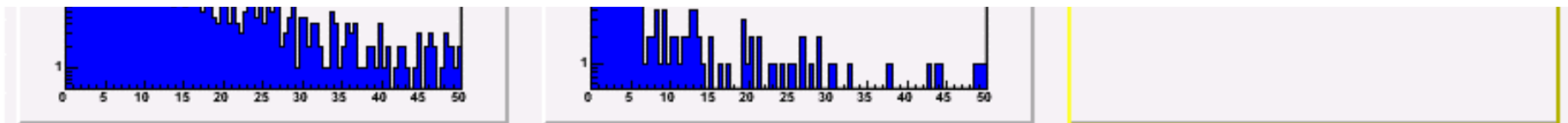
And the answer is...

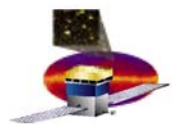
- The online LAC setting for these two channels did indeed get fixed – XtalRecTool.cxx shows that the single face values stored in the CalTuple get calculated first.
- But to calculate the crystal energy using both faces, a cut on the offline LAC value is applied a little farther on in the code, and the result is stored in the SVAC tuple.
- You can look at \$LATCalibRoot/CAL/LAT/tholdci_16twr_01_25_2006.xml where LACDAC is still 127 for the POS end of crystals 4 4 9 and 5 1 9.
- The solution : Zach re-generated tholdci_16twr at the same time as the current online LAC settings but they never got propagated to the rdb metadata database.
- Anders prefers to wait for the end of the current processing before changing, rather than change horses in the middle of a stream.

Even more recent data



- Before today's meeting, looked at Anders' list of FSW E2E runs and picked the most recent through the pipeline: 7703553-56, 59, 70,71 are LAT 70x's from Wednesday 26th.
- Ran my "psf checker" (other code takes longer than I had...) **It's fine.**





Conclusions

- January LATTE muons look the same as April FSW muons.

2 renegade channels (January, looser cuts)

ETLC4109

ETLC4109

Entries	15186
Mean	11.28
Underflow	0
Overflow	84
χ^2 / ndf	286.9 / 75
Constant	2860 ± 40.2
MPV	11.38 ± 0.02
Sigma	0.8247 ± 0.0096

normal "LAC"

ETLC4409

ETLC4409

Entries	12799
Mean	8.671
Underflow	0
Overflow	62
χ^2 / ndf	184.1 / 75
Constant	1802 ± 31.8
MPV	11.8 ± 0.0
Sigma	0.8748 ± 0.0128

"LAC" too high
(FM105)

ETLC5109

ETLC5109

Entries	16434
Mean	7.442
Underflow	0
Overflow	91
χ^2 / ndf	322.8 / 75
Constant	1750 ± 31.4
MPV	12.27 ± 0.02
Sigma	0.9536 ± 0.0148

"LAC" too high
(FM102)

ETLC6109

ETLC6109

Entries	16201
Mean	11.28
Underflow	0
Overflow	91
χ^2 / ndf	295.1 / 75
Constant	3050 ± 42.0
MPV	11.39 ± 0.02
Sigma	0.8193 ± 0.0093

normal "LAC"