FCAL monitoring V RunPeriod-2019-11 ver15/16 - Batch 5-6

Su., 2020-08-20

FCAL monitoring IV:

Batch 1 (ver08)

timing shift in fcal hits 2 before incl. run 71533 ..... (presists but un-problematic)

Batch 2 (ver08)

run 71598

FCAL Hits 1: rel more low-energy background,

FCAL Hits 2: time distribution sharper ..... (presists but un-problematic)

run 71672, run 71692

FCAL Hits 1: rel more low-energy background

FCAL Hits 2: time distribution sharper ..... (presists but un-problematic)

Recon FCAL Matching: track distance vs theta island less pronounced ... (persists but subtle, viz ok?)

Batch 3 and 4 (ver08): no FCAL comments

Batch 5 (ver12): no FCAL comments

Batch 6: see below ... mostly issues persist

Batch 7-8: to be done (very soon!)

FCAL monitoring RunPeriod-2019-11 ver12 - Batch 6 (runs 72068 - 72163)

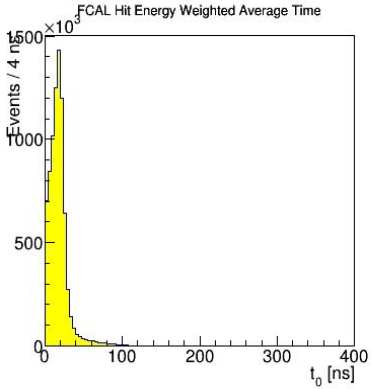
ver16

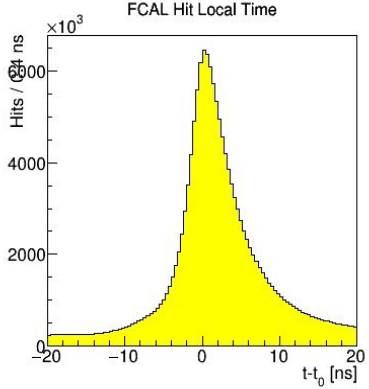
	72094	72099 (AMO)	72104*	72113*	72123* (AMO)	72124 (AMO)	72125 - 72162	72163*
FCAL Local Hit Time RMS: wider for outer 'rings'	ver12 ver16 ? **page 3**	ver12 ver16 **page 4**				ver12 ver16 **page 5**		
FCAL Local Hit Time RMS: structure upper left quadrant edge			ver12 ver16 **page 11ff**	ver12 ver16 **page 11ff**	ver12 ver16 **page 11ff**			ver12 ver16 **page 11ff**
FCAL Hit Average Energy: structure upper left quadrant edge			ver12 ver16 **page 11ff**	ver12 ver16 **page 11ff**	ver12 ver16 **page 11ff**			ver12 ver16 **page 11ff**
FCAL Neutral Shower dt vs Energy: vertical bands			ver12 ver16 ? **page 6**	ver12 ver16 **page 7**				
FCAL Neutral Shower dt vs Energy: horizontal bands					ver12 ver16 **page 8**		ver12 ver16 **page 9**	ver12 ver16 **page 10**

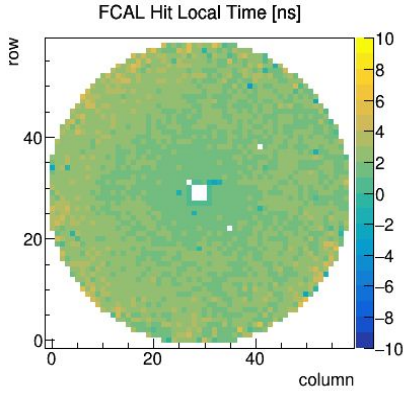
*overall quality: no

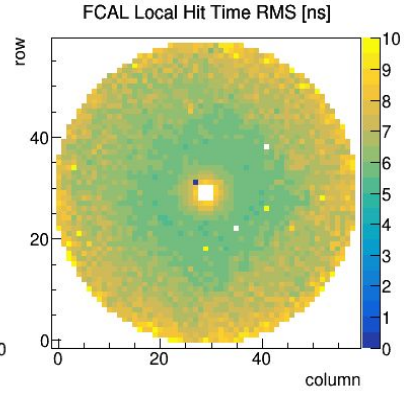
FCAL Local Hit Time RMS: wider for outer 'rings': solved in ver16, or stats, or different part of the run?

ver12 run 72094

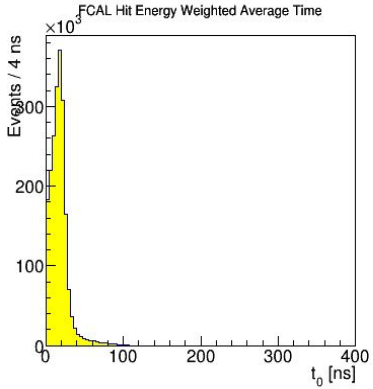


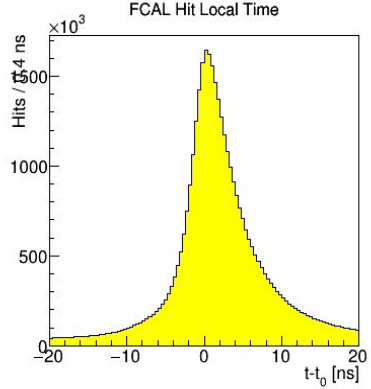


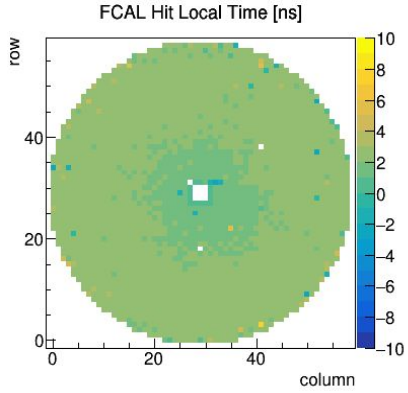


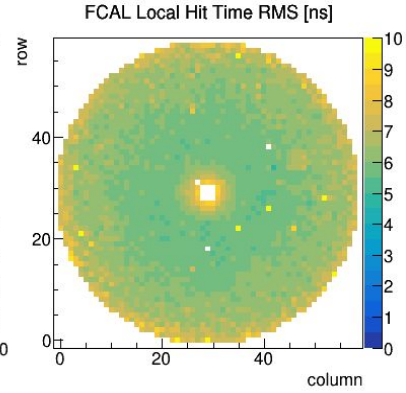


ver16 run 72094



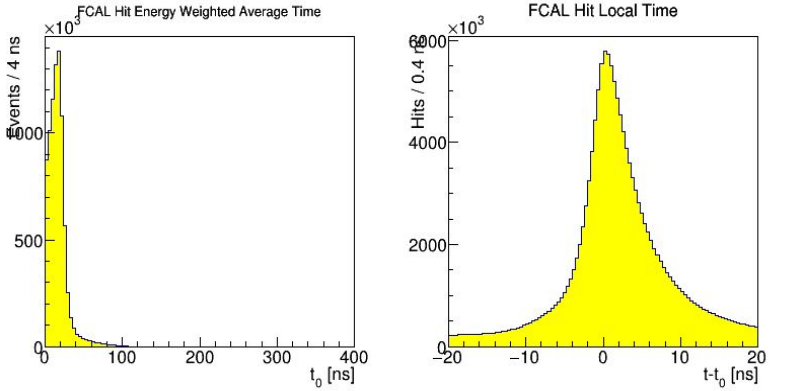


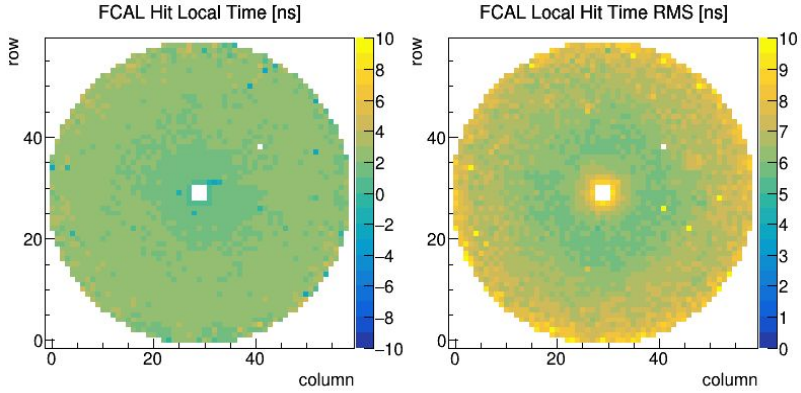




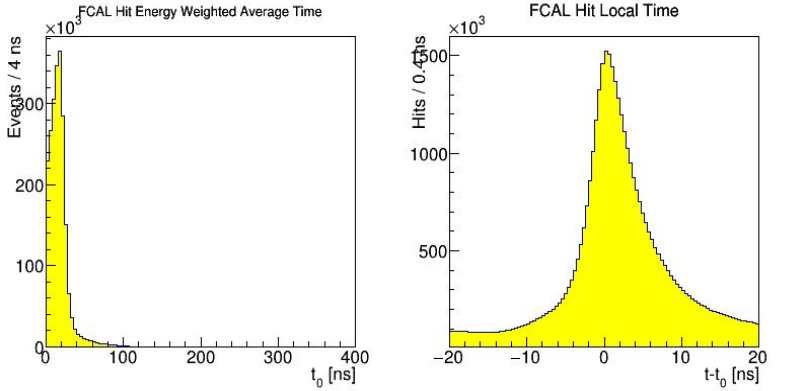
FCAL Local Hit Time RMS: wider for outer 'rings'

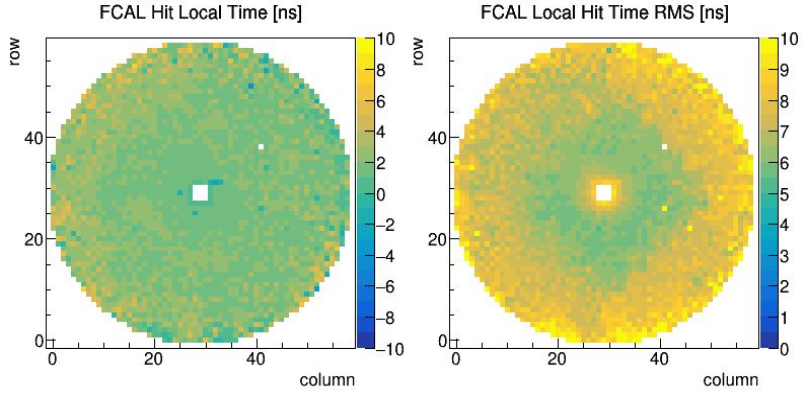
ver12 run 72099





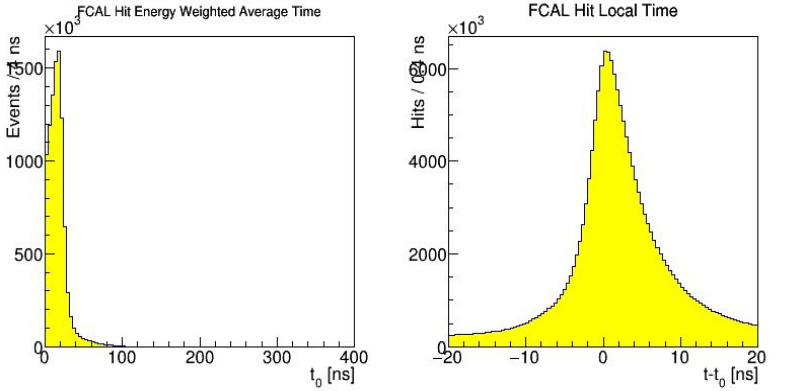
ver16 run 72099

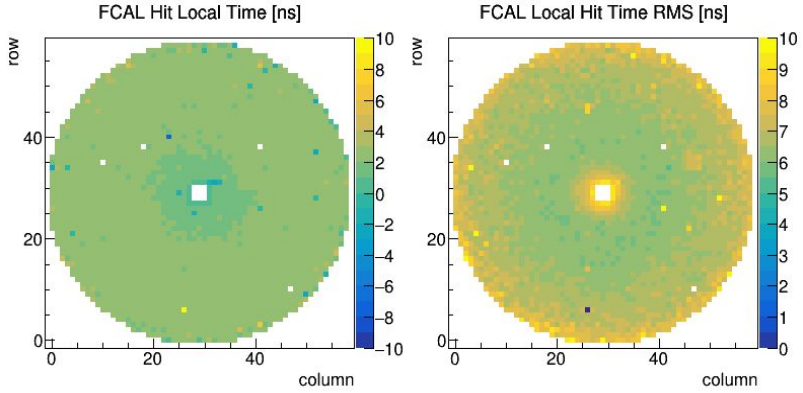




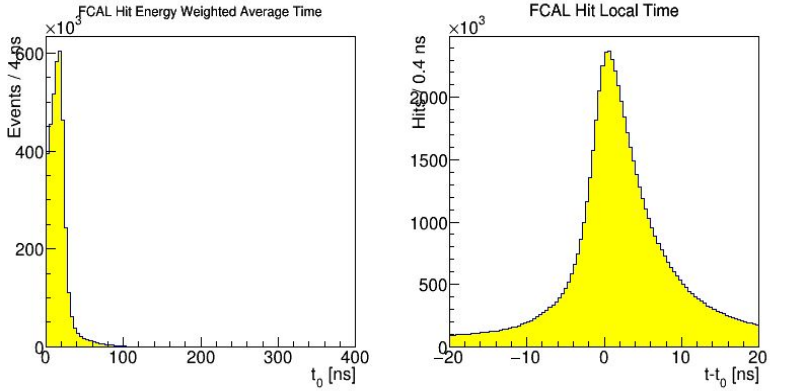
FCAL Local Hit Time RMS: wider for outer 'rings'

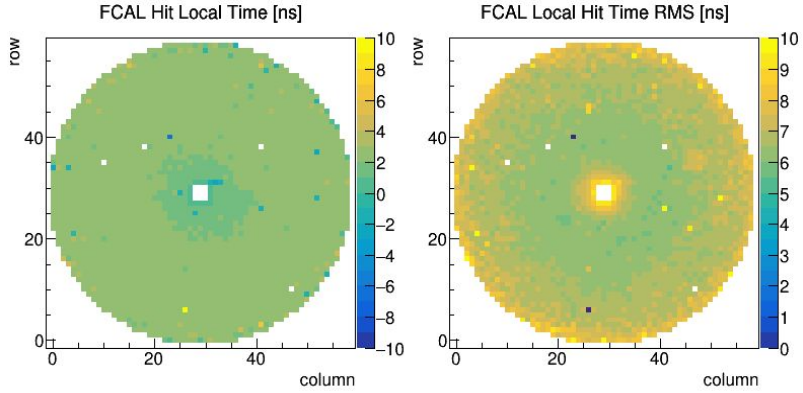
ver12 run 72124





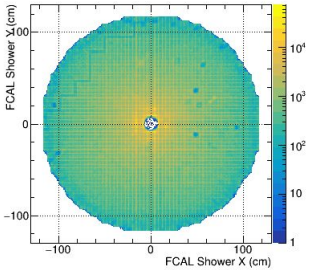
ver16 run 72124

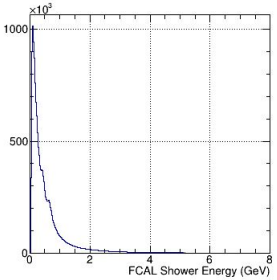


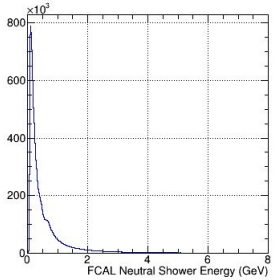


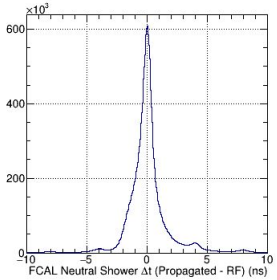
FCAL Neutral Shower dt vs Energy: vertical bands

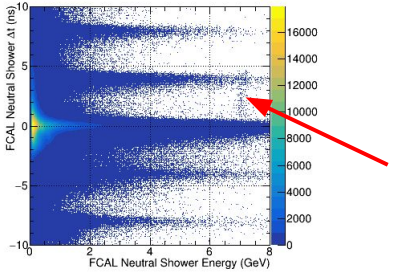
ver12 run 72104



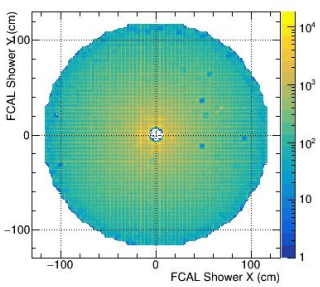


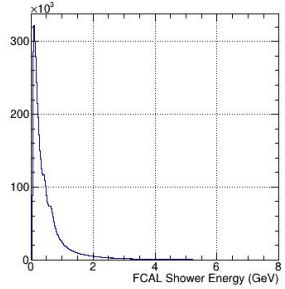


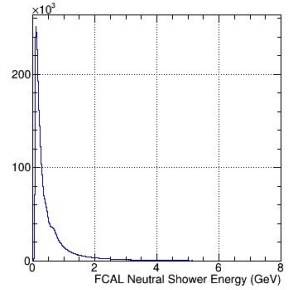


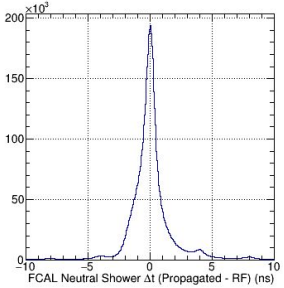


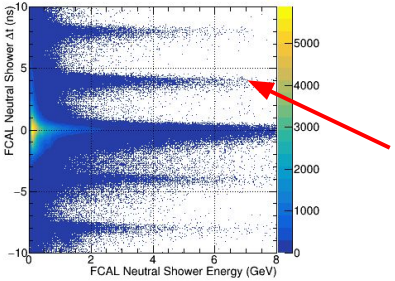
ver16 run 72104







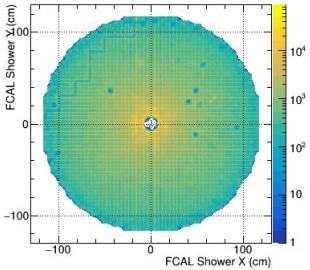


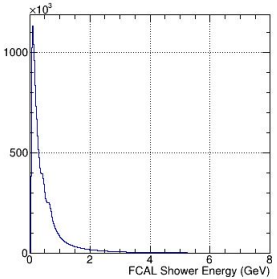


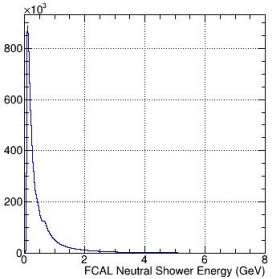
less stats, probably not solved

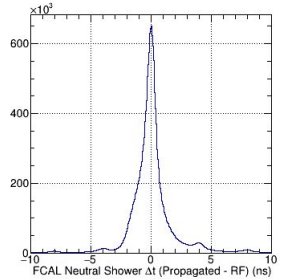
FCAL Neutral Shower dt vs Energy: vertical bands

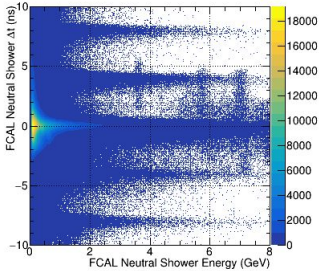
ver12 run 72113



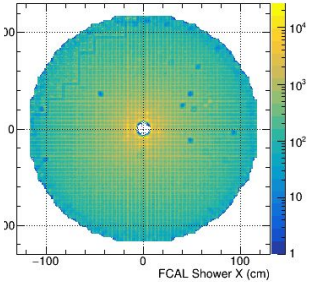


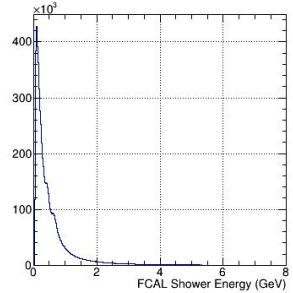


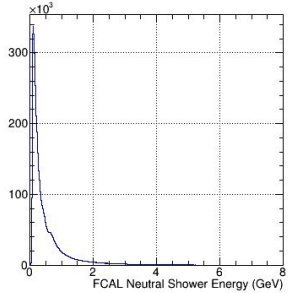


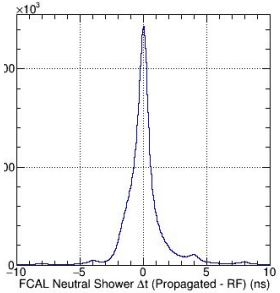


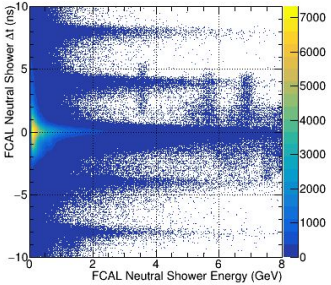
ver16 run 72113





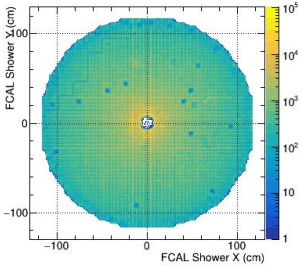


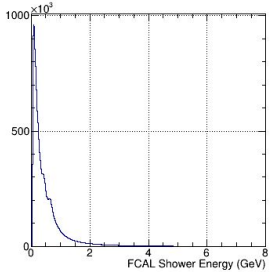


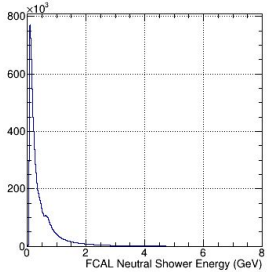


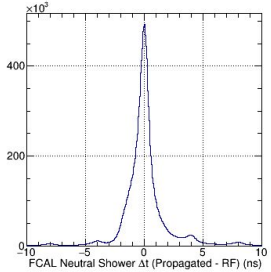
FCAL Neutral Shower dt vs Energy: horizontal bands

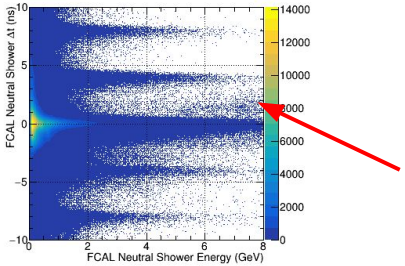
ver12 run 72123



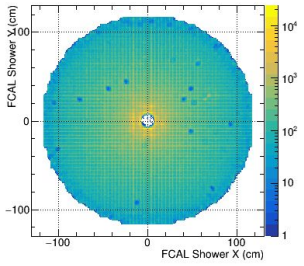


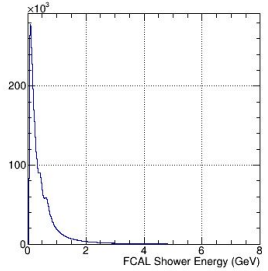


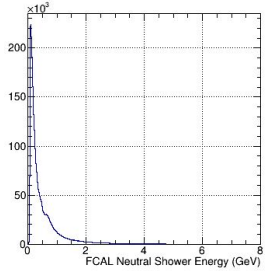


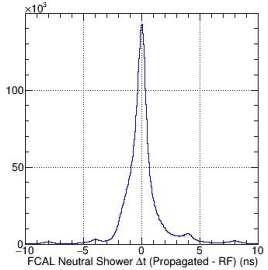


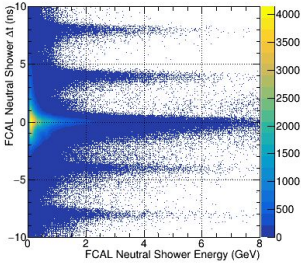
ver16 run 72123







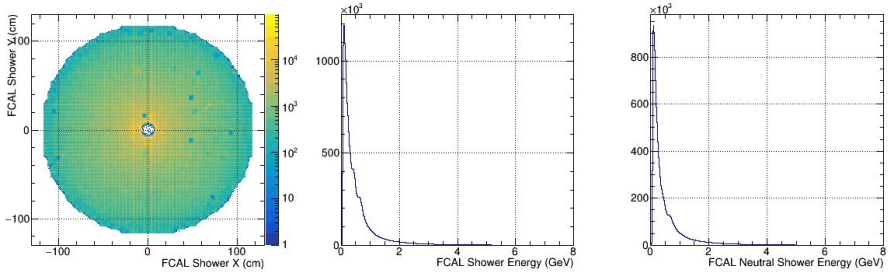


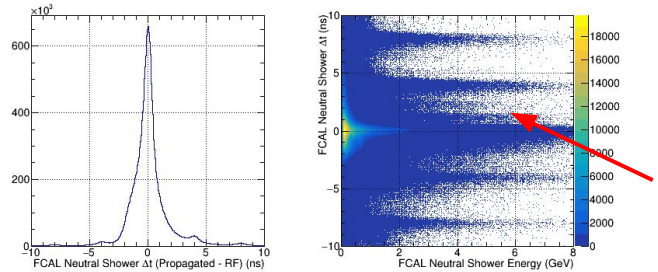


less stats, probably not solved

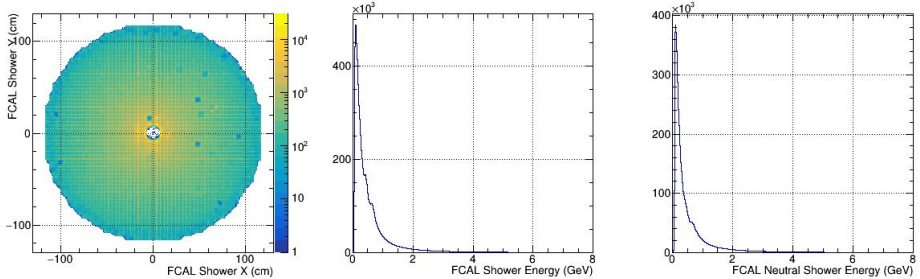
FCAL Neutral Shower dt vs Energy: horizontal bands (runs 72125 - 72162)

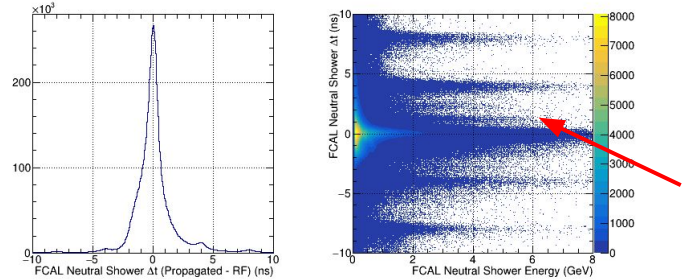
ver12 run 72162





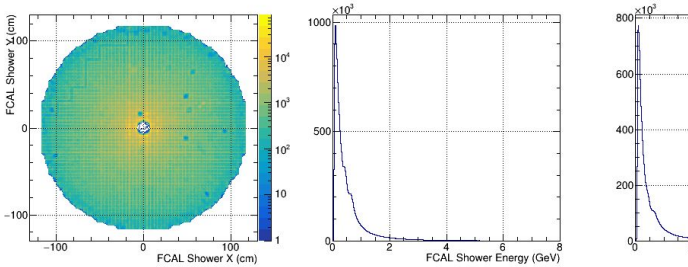
ver16 run 72162

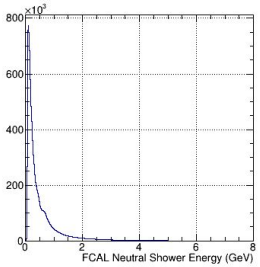


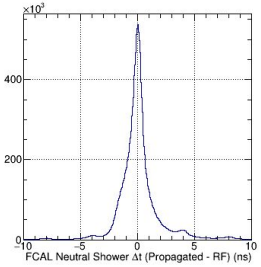


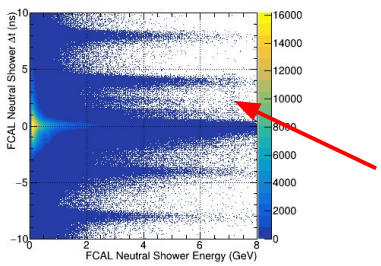
FCAL Neutral Shower dt vs Energy: horizontal bands (runs 72125 - 72162)

ver12 run 72163

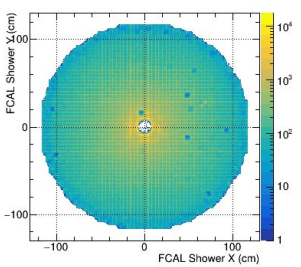


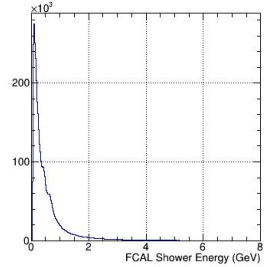


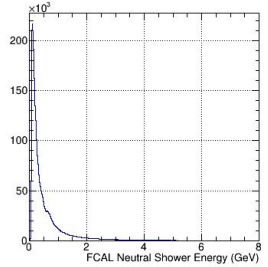


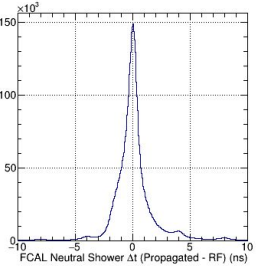


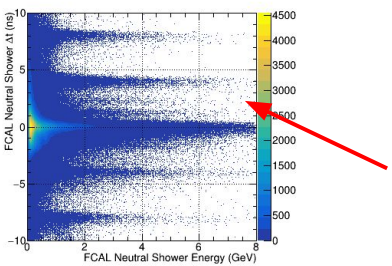
ver16 run 72163









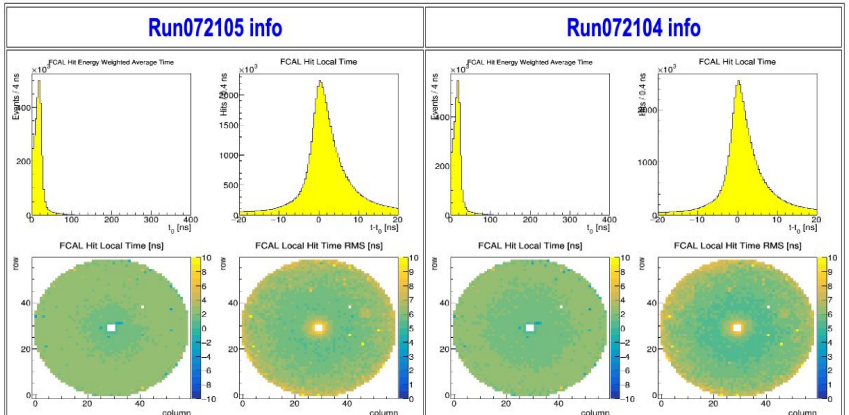


Actually, looks like both horizontal and vertical bands.

logbook run 72104
"structure upper left quadrant edge"

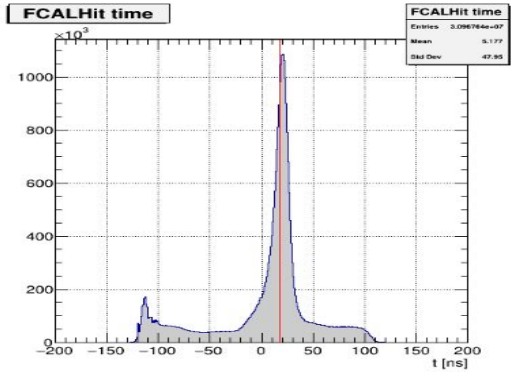
Owl shift summary 03/07/2020
Lognumber 3798927. Submitted by dlersch on Sat, 03/07/2020 - 00:11.
Last updated on Sat, 03/07/2020 - 08:00
0:00 - Daniel takes over the shift from Sebastian, currently running 350nA @ JD70-105 47um 0/90 PARA
1:14 - Kevin noticed that counts in the upstream beam profiler are missing, please see entry:
https://logbooks.jlab.org/entry/3798964
1:21 - Restarted the troubling beam profiler hv channel (hvx 1) --> Problem seems to be fixed, see:
https://logbooks.jlab.org/entry/3798968
1:33 - Stopped run 72104, switching rotation from PARA to PERP for next run
1:39 - Started run 72105, had to nudge coherent peak a bit -> screenshots of coherent peak edge are attached
3:45 - Stopped run 72105, start next run with same configuration
3:55 - Antonio arrives to replace Kevin as a worker
5:47 - Stopped run 72106, switch radiator to: JD70-105 47um 45/135 PARA
6:03 - Start run 72107, lost few minutes due to adjustment of coherent peak edge (+ beam was gone a few times) -> see attachment
7:42 - Mark arrives, to take over the day shift
==========
Collected data:
Run | Radiator | Start | End | #Events

72104 | JD70-105 47um 0/90 PARA | 23:23 | 1:35 | 447M
72105 | JD70-105 47um 0/90 PERP | 1: 39 | 3:46 | 391M
72106 | JD70-105 47um 0/90 PERP | 3:47 | 5:47 | 430M
72107 | JD70-105 47um 45/135 PARA | 6:04 | |



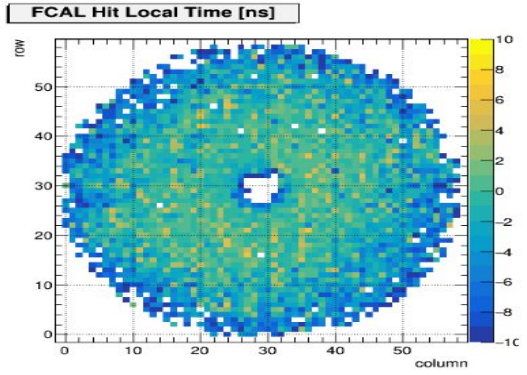
last check on spectra:
Hall-D Monitoring Plots Run 72104

Hall-D Monitoring Plots for Sat Mar 7 00:23:57 2020 33/33 pages generated

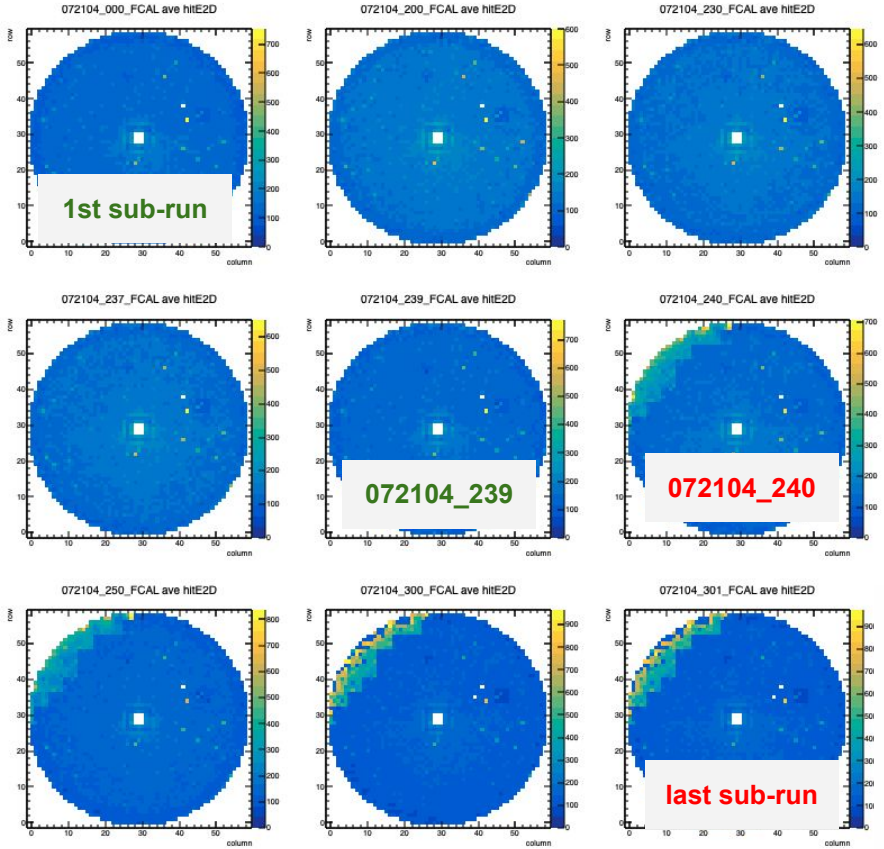


problem is seen in <-- offline spectra;

would be hard to see from this online monitoring spectrum -->



check on history within run; analysis of rawdata subruns w/ FCAL_online plugin



zooming in on point in time of last good sub-run 072104_239

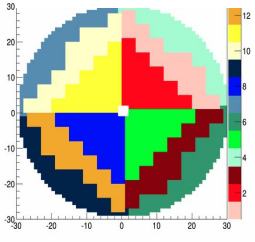
David Lawrence wrote:
... the HOSS DB time will typically be ~2-3 minutes after the first event of the file actually occurred. ...

```
+------------------+------+------+
| created          | run  | file |
...

| 2020-03-07 01:10:09  | 72104 |     238 |
| 2020-03-07 01:09:53  | 72104 |     239 |
| 2020-03-07 01:10:25  | 72104 |     240 |
```

logbook:
1:14 - noticed that counts in the upstream beam profiler are missing
1:21 - restarted the beam profiler hv channel (hvx 1)
.
.. doesnt look related?

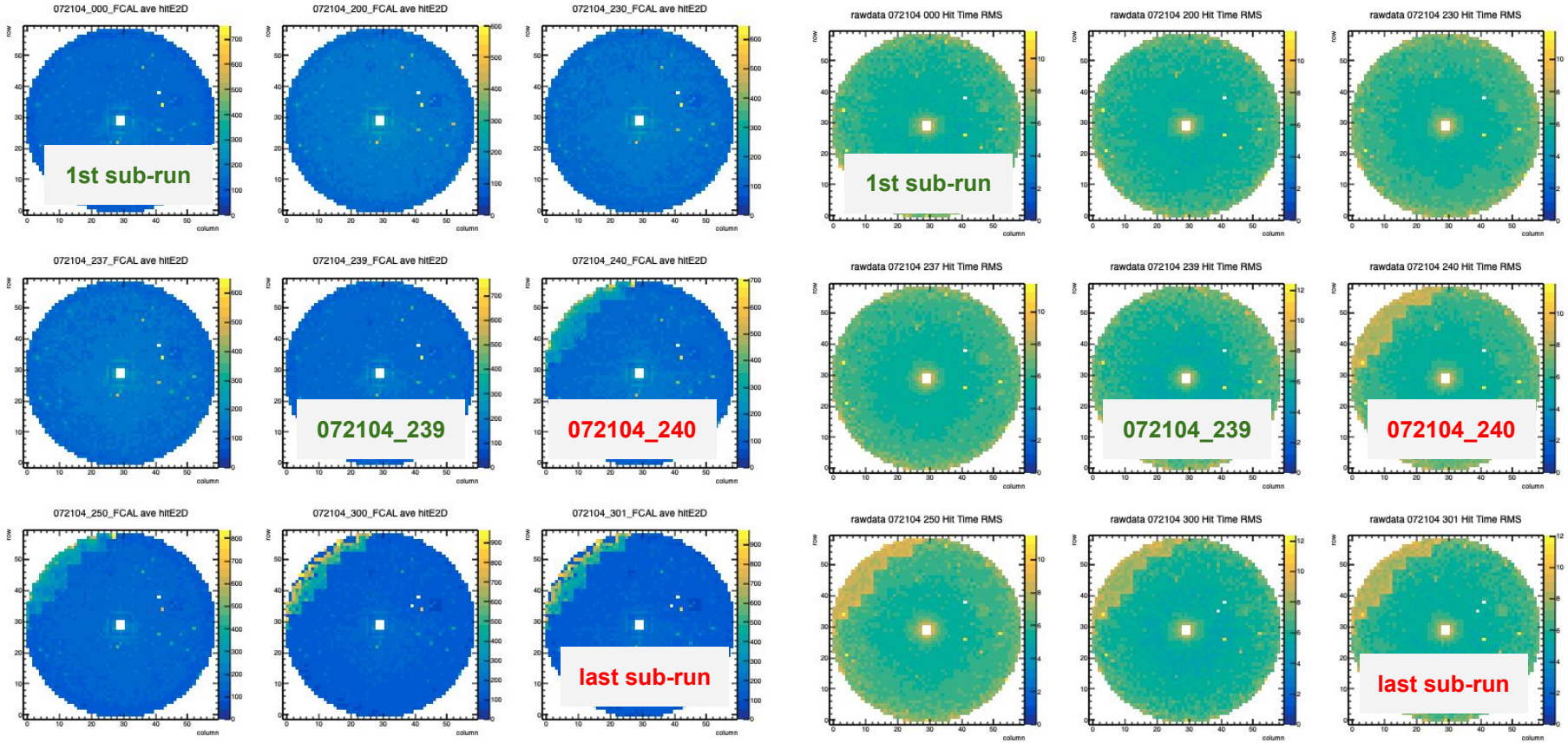
DAQ crates looking upstream



pending: looking with Mark on near-in-time issues with crates (EPICS archive)

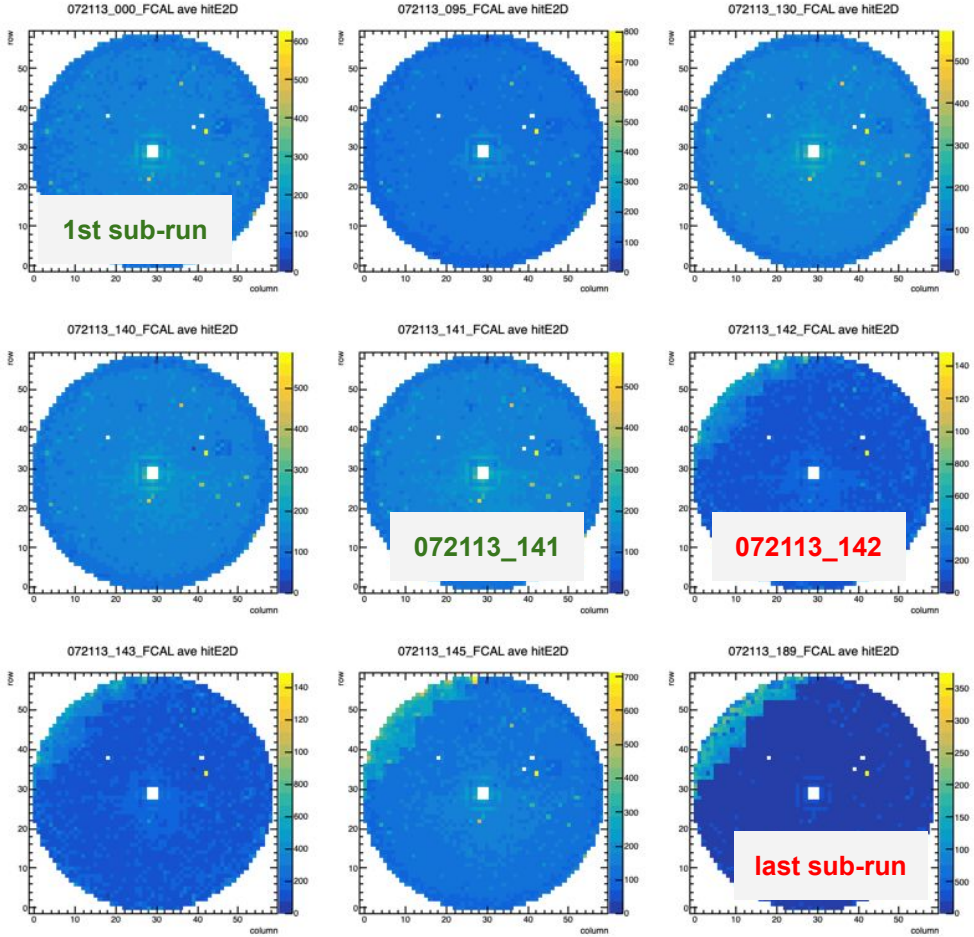
072104_239 is last good sub-run. Throw out entire run? Mark these channels as bad for entire run?

check on history within run; analysis of rawdata subruns w/ FCAL_online plugin



072104_239 is last good sub-run. Just to show, issue is present in both histos, energy and time rms spectra.

run 72113 .... *"structure upper left quadrant edge ... "*



logbook:

Lognumber 3799351. Last updated on Sun, 03/08/2020 - 00:03

...

17:05 - Stopping run 072112.

17:08 - Starting run 072113.

72113_141 2020-03-07 18:00:04 (hoss time)

72113_142 2020-03-07 18:13:24 (hoss time)

18:30 - We have had very stable running during shift up to this point. The accelerator has a cavity issue. Hope this does not result in long downtime.

18:38 - Stopping run 072113 while the accelerator is brought back up to stable running conditions.

They are currently tuning hall C, the priority hall. We will do another 30 minutes in this orientation before switching to PERP. -> https://logbooks.jlab.org/entry/3799451

.....

19:35 - Beam position looks to be improved.

19:50 - Accelerator having issue keeping beam up without trips. -> https://logbooks.jlab.org/entry/3799501

...

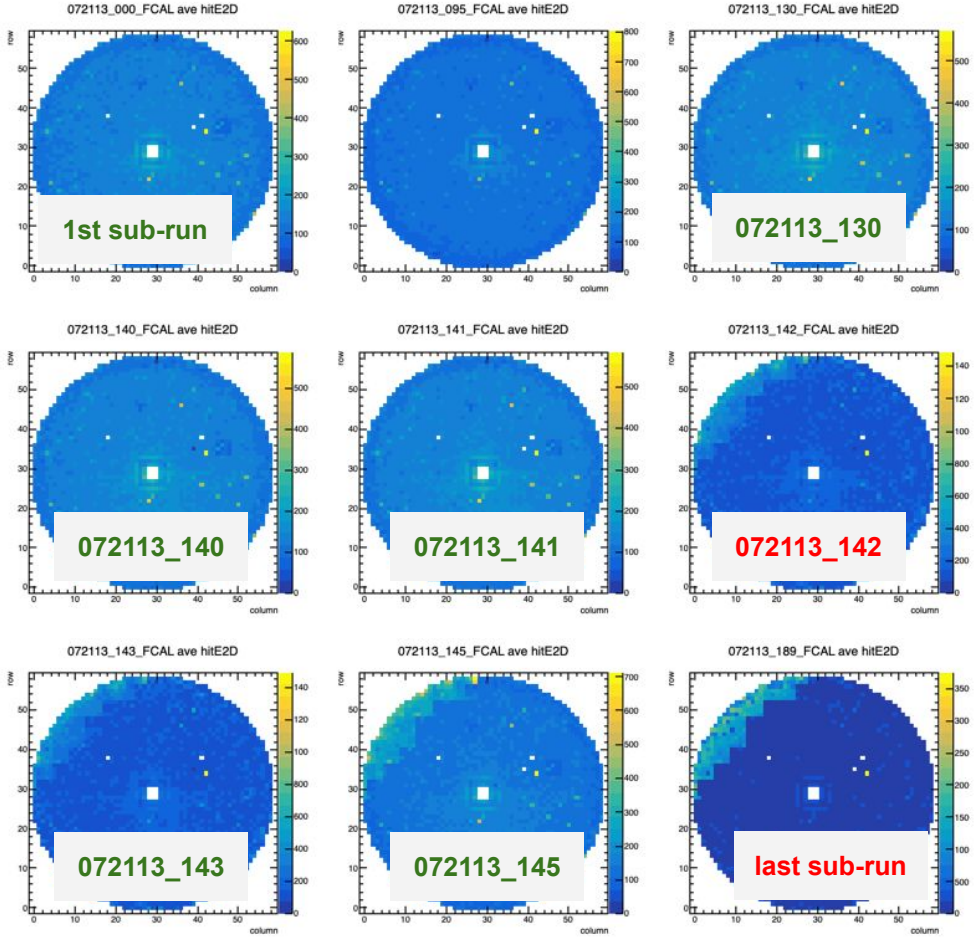
19:56 - Stopping run 072114. Switching to PERP. Waiting for stable beam to start next run.

20:00 - No beam. The accelerator is having ongoing issues.

20:07 - noticed the DAQ event count is increasing when the DAQ has not been started. ?????? -> https://logbooks.jlab.org/entry/3799518

.....

run 72113 .... *"structure upper left quadrant edge ... "*



connection with DAQ crate?

errors while analyzing subruns with FCAL_online plugin

(did not yet pay attention to this with run 72104)

072113_145

JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=41Hz)

072113_143

JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=42Hz)
JANA ERROR>>ERROR: F1 TDC chip "unlocked" flag set!0.0Hz (avg.: 136.9Hz)
...
JANA ERROR>>ERROR: F1 TDC chip "unlocked" flag set! -- last warning
1007.5k events processed (1007.5k events read) 106.0Hz (avg.: 132.7Hz)

072113_142 .... first bad sub-run

274.2k events processed (274.2k events read) 154.0Hz (avg.: 148.3Hz)
JANA ERROR>>ERROR: F1 TDC chip "unlocked" flag set!4.0Hz (avg.: 150.3Hz)
...
JANA ERROR>>ERROR: F1 TDC chip "unlocked" flag set! -- last warning
...
JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=4.4Hz)
...
JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=4.6Hz)
JANA ERROR>>FADC250 unknown data type (11) (0xd8000004)
JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=4.9Hz)

072113_141 .... last good sub-run

no such message

072113_140

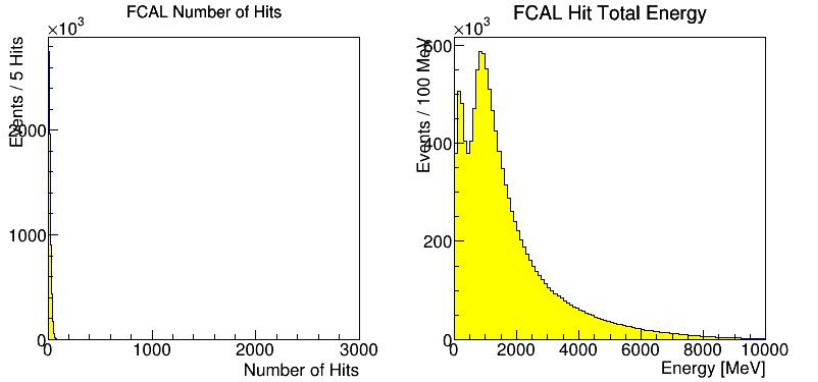
JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=40Hz)
JANA ERROR>>Bug #1: bad f250 Pulse Data for rocid=17 slot=3 channel=46Hz)

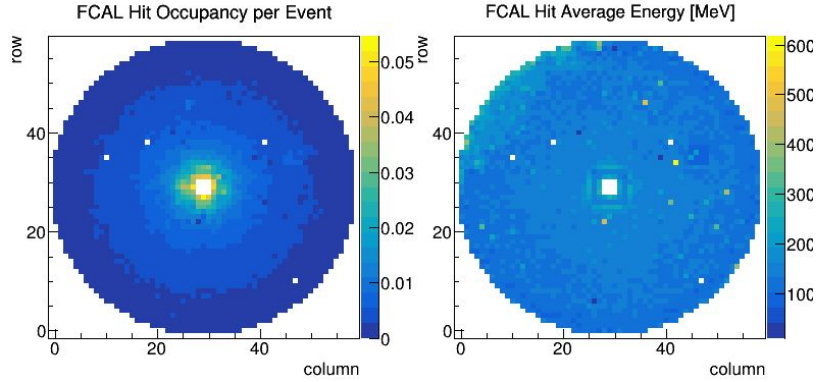
072113_130

no such message

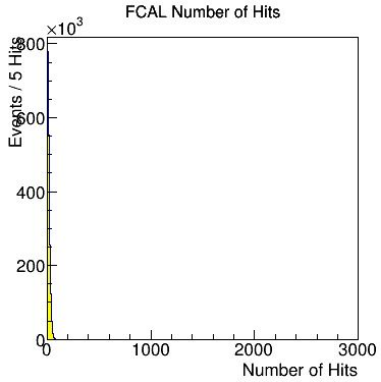
run 72123 *.... "structure upper left quadrant edge ... "*

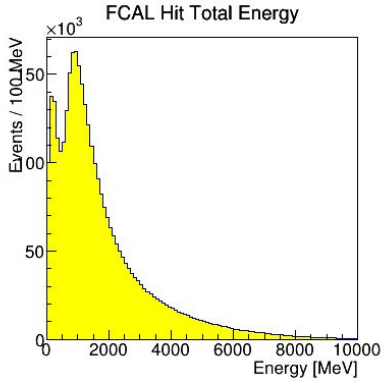
ver12 run 72123

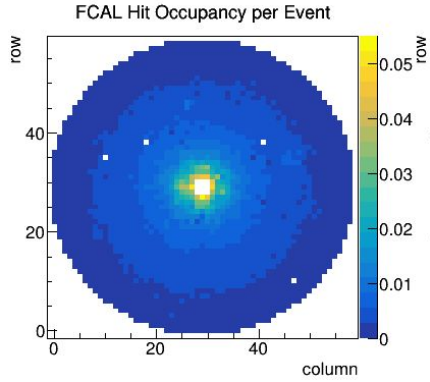


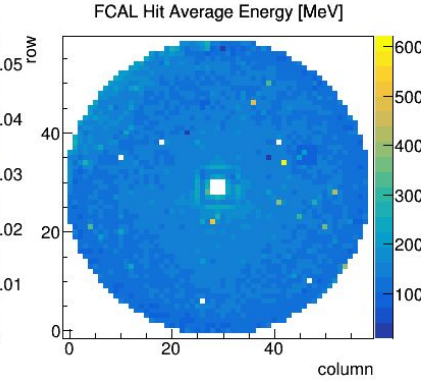


ver16 run 72123



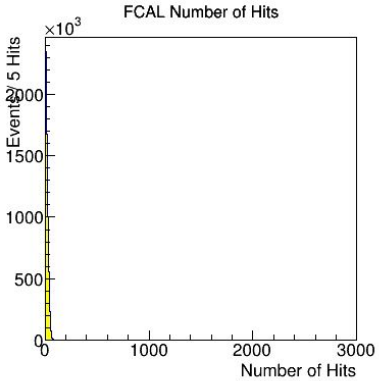


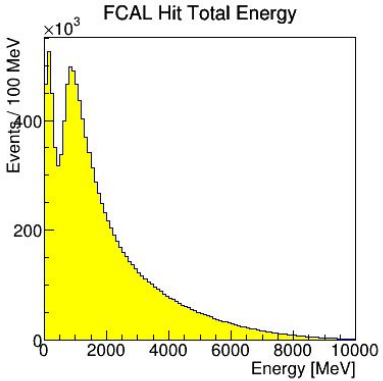


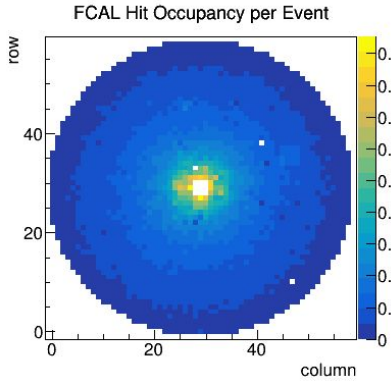


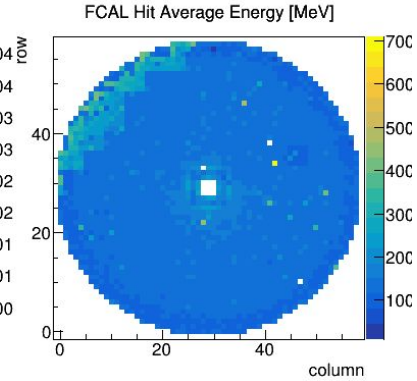
run 72123 *.... "structure upper left quadrant edge ... "*

ver12 run 72163

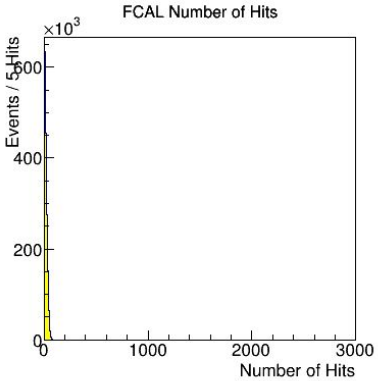


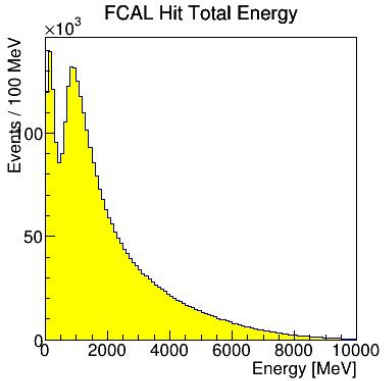


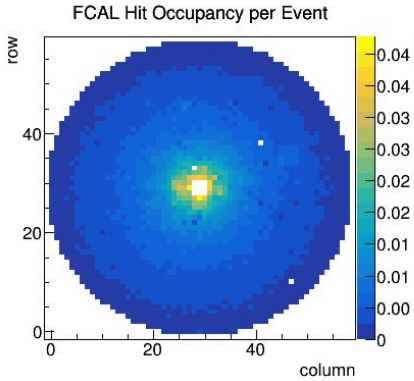


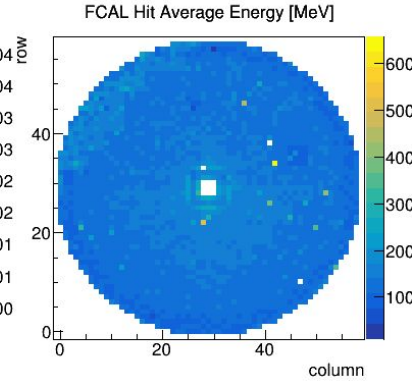


ver16 run 72163









conclusions RunPeriod-2019-11 ver12 - Batch 6 (runs 72068 - 72163)

ver16

In general, the issues have not been solved from ver12 to ver16. That was also not expected.

- FCAL Local Hit Time RMS: wider for outer 'rings'
  - **not relevant?!**

- FCAL Local Hit Time RMS and Hit Average Energy: structure upper left quadrant edge
  - 4 runs suffer from this - **could be marked bad runs or FCAL bad channels?**
  - still trying to understand the cause, **related to DAQ crates ?!**
  - recommend to **put these type of spectra in online monitoring,** especially if cause is not understood/fixed.

- FCAL Neutral Shower dt vs Energy: vertical bands and horizontal bands
  - **overlap with BCAL?**
  - cause, relevance?