



# TOF shifter guide

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**TOF group**

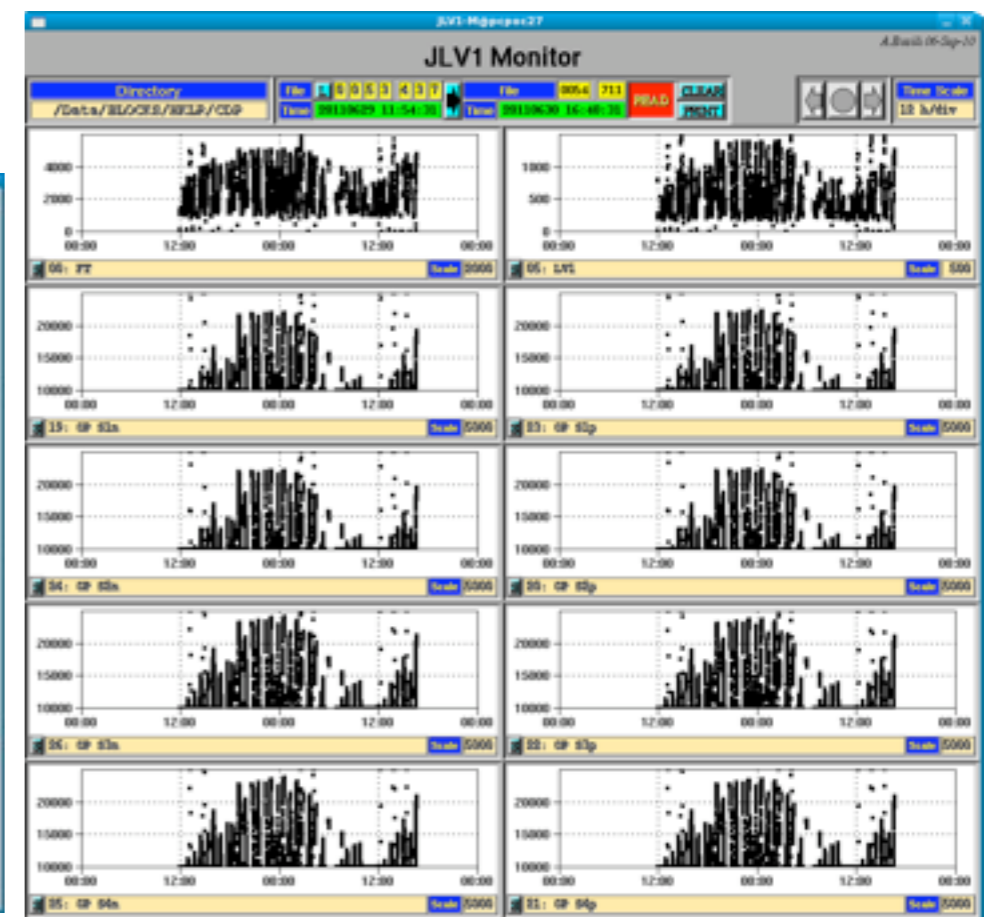
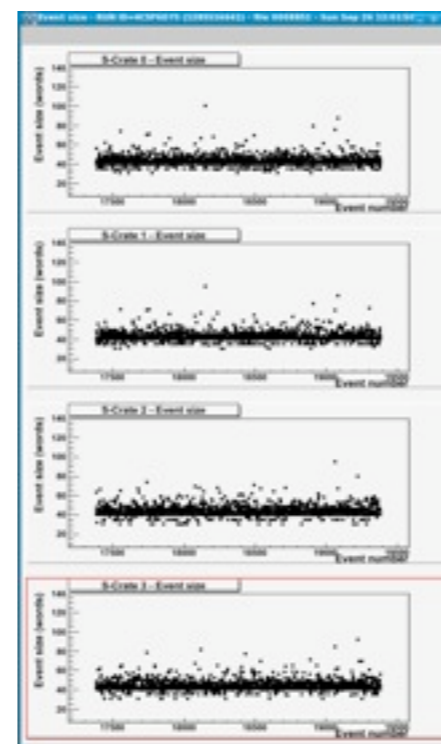
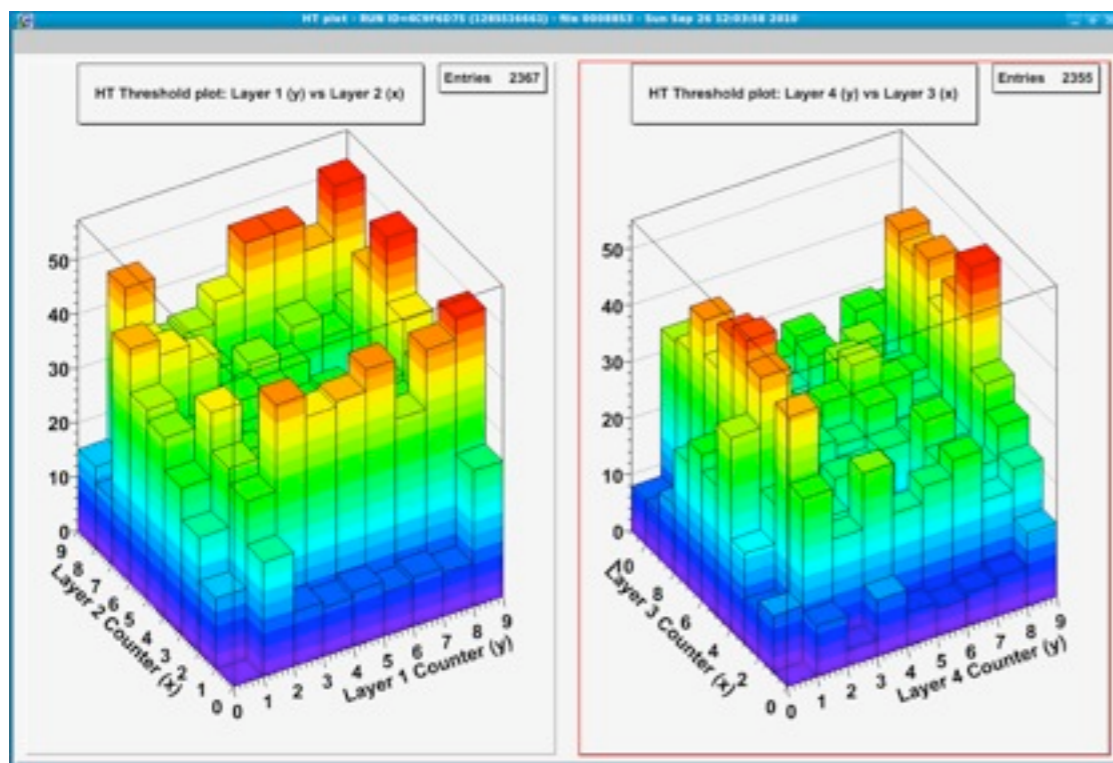
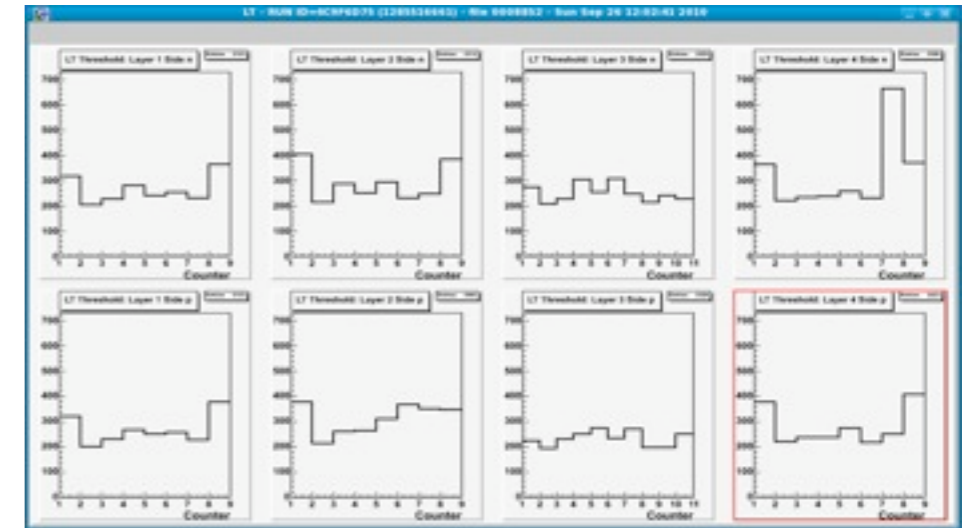
*Last update: V. Bindi February 10th 2012*



# TOF shifter guide

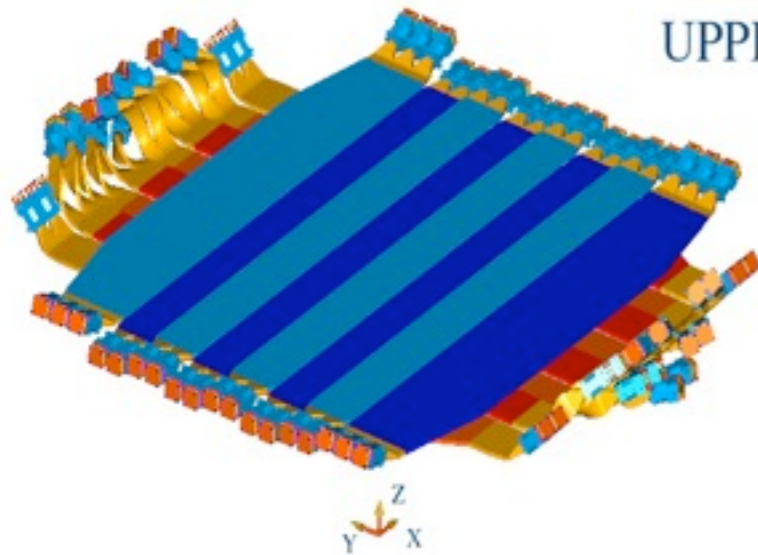


- Introduction about the TOF
- Programs and workspace: a summary
- Start up of the monitoring programs
- Important plots and quantities to be checked
- Standard behavior expected for TOF
- The shifter duties
- What to do in case errors





# TOF shifter guide: introduction



UPPER TOF

PLANE 1

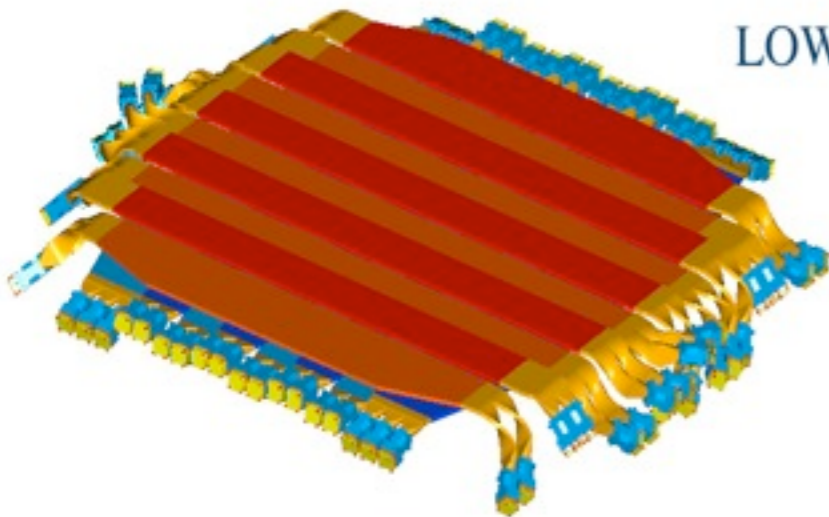
PLANE 2

TOF consists of 4 plastic scintillator planes 2 above and 2 below the magnet.

The counters of adjacent planes are orthogonal.

The number of counters per plane is 8, 8, 10, 8 counters.

The outermost counters have a trapezoidal shape in order to cover all the acceptance.



LOWER TOF

PLANE 3

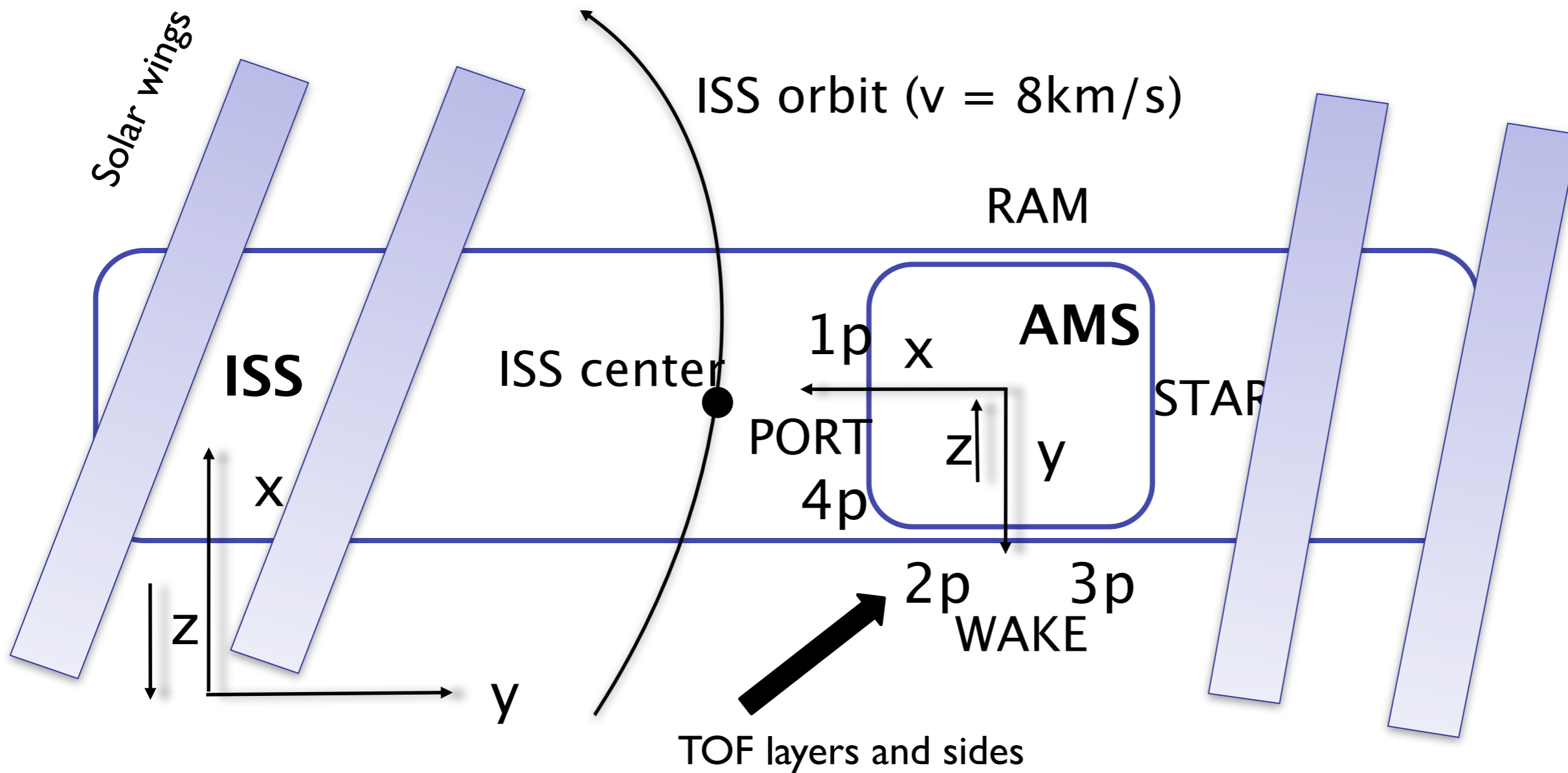
PLANE 4

Each TOF counter is:

- composed by a plastic scintillator 1 cm thick and around 120 cm long,
- read at both ends by 2/3 photomultiplier tubes,
- connected with transparent light guides.



# TOF plane position with respect to the ISS: top view





# Programs and workspace: a quick summary for shifter with expertise

## Workspace Data monitor: Scientific data monitor

```
cd ~/TOF/Monitor2010
```

```
./monitor /Data/BLOCKS/SCIBPB/RT/ 0034054 b 5000 2
```

## Workspace Data monitor 2: Calibration and Temperatures

```
cd ~/TOF/Qlistmon
```

**Dynode pedestal monitor**      TOF-CALD-M &

**Anode pedestal monitor**      TOF-CALA-M &

**DTS monitor**                      TOF-DTS-3-M &

## Workspace Qlistmon: Housekeeping monitor

```
cd ~/TOF/Monitor2010_hk
```

```
./monitor /Data/BLOCKS/HKLR/CDP 41308 z
```

## Directories:

**SCI** @ /Data/BLOCKS/SCIBPB/RT/

**HK** @ /Data/BLOCKS/HKLR/CDP/



# TOF shifter guide: start up

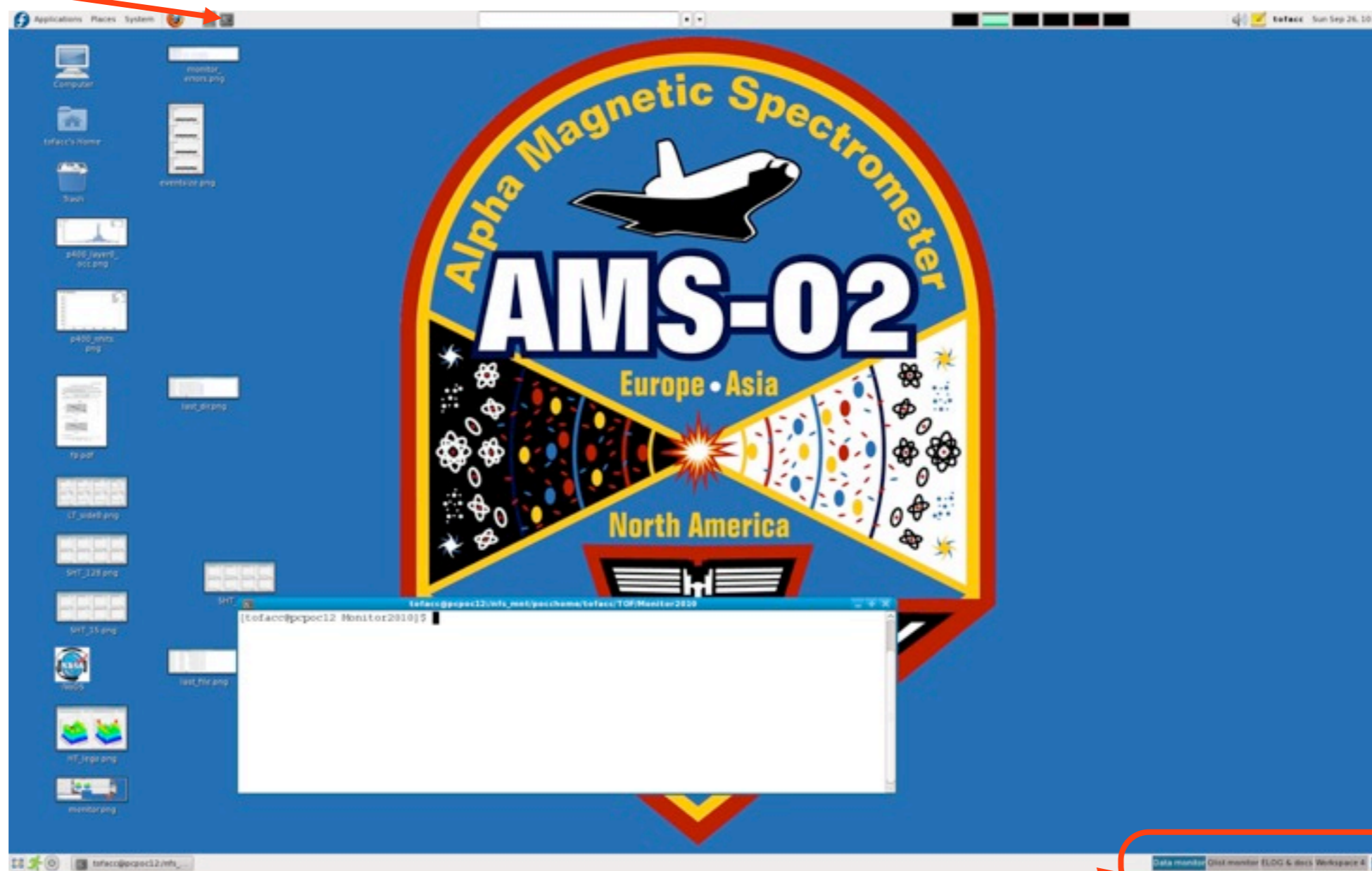


In TOF POC station login as user *toface* (usually it's already done!). The password is the same for all stations.

- go in the workspace *Data monitor*
- if the monitor is running stop it pressing from the shell **Ctrl + c**

## Terminal Window

click to open



6

Workspace  
click to change



# TOF shifter guide: last directory and file



From the terminal go to the directory used for the monitoring:

```
cd ~/TOF/Monitor2010
```

Check last directory:

```
ls -la /Data/BLOCKS/SCIBPB/RT/
```

```
[tofacc@pcpoc27 tofacc]$ ls -la /Data/BLOCKS/SCIBPB/RT/
total 2348
drwxrwxr-x+ 15 ams ams 4096 2011-07-01 06:31 .
drwxrwxr-x+  5 ams ams 4096 2011-06-19 10:04 ..
drwxrwxr-x+  2 ams ams 4096 2011-06-19 10:04 0022
drwxrwxr-x+  2 ams ams 4096 2011-06-19 10:04 0023
drwxrwxr-x+  2 ams ams 4096 2011-06-19 10:04 0024
drwxrwxr-x+  2 ams ams 12288 2011-06-21 11:27 0025
drwxrwxr-x+  2 ams ams 20480 2011-06-22 08:35 0026
drwxrwxr-x+  2 ams ams 20480 2011-06-23 07:26 0027
drwxrwxr-x+  2 ams ams 20480 2011-06-24 14:37 0028
drwxrwxr-x+  2 ams ams 20480 2011-06-25 20:09 0029
drwxrwxr-x+  2 ams ams 20480 2011-06-27 05:40 0030
drwxrwxr-x+  2 ams ams 20480 2011-06-28 14:30 0031
drwxrwxr-x+  2 ams ams 20480 2011-06-29 23:31 0032
drwxrwxr-x+  2 ams ams 20480 2011-07-01 04:47 0033
drwxrwxr-x+  2 ams ams 4096 2011-07-01 06:31 0034
-rw-rw-r--+  1 ams ams 2133996 2011-07-01 06:31 deframing.log
[tofacc@pcpoc27 tofacc]$
```

**Last Directory  
(ex: 0034)**

Find the last file inside the last directory (as example 0034):

```
ls -la /Data/BLOCKS/SCIBPB/RT/0034
```

```
-rw-rw-r--+ 1 ams ams 94549004 2011-07-01 06:29 052
-rw-rw-r--+ 1 ams ams 105982046 2011-07-01 06:30 053
-rw-rw-r--+ 1 ams ams 113386776 2011-07-01 06:31 054
[tofacc@pcpoc27 tofacc]$
```

**Last file  
(ex: 0054)**



# TOF shifter guide: monitoring



Start the Scientific data monitor:

**./monitor**

Program name

**/Data/BLOCKS/SCIBPB/RT/**

Blocks directory

**0034054**

Directory File

**b**

Plot option

**5000**

Update

**2**

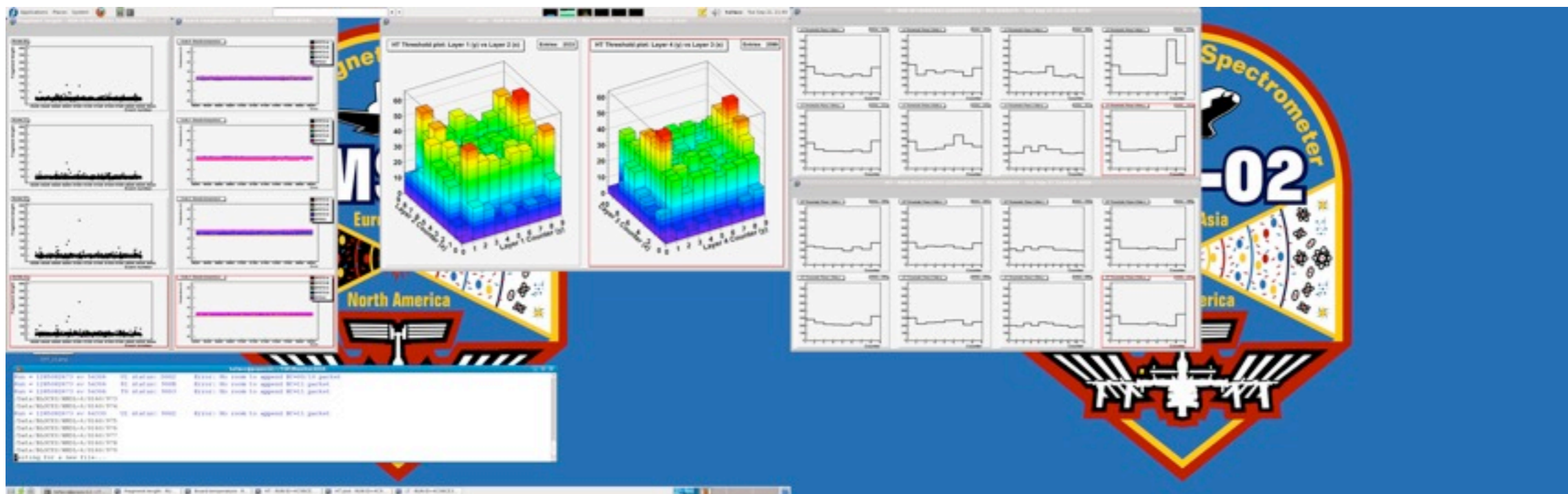
Debug

The option:

**b** - means basic plots for the shifter (do not change it)

**Update** - is the number of AMS events visualized in the plot (2000 = default)

**2** - write CALIBRATION, CONFIGURATION, DAQ HOUSE KEEPING and ERROR files.



Adjust the position of the 5 windows opened by the monitor to better see the plots and histograms.





# TOF shifter guide: monitor



While the monitor is running:

in the terminal is indicated which data file the monitor is processing.

When CALIBRATION, CONFIGURATION and DAQ HOUSE KEEPING data are processed the data are stored in specific files and directories.

A file containing all the ERROR during the data acquisition is stored in a specific file and directory.

```
tofacc@pcpoc12:/nfs_mnt/pocchome/tofacc/TOF/Monitor2010
/Data/BLOCKS/RS422/0008/810
/Data/BLOCKS/RS422/0008/811
/Data/BLOCKS/RS422/0008/812
/Data/BLOCKS/RS422/0008/813
/Data/BLOCKS/RS422/0008/814
/Data/BLOCKS/RS422/0008/815
/Data/BLOCKS/RS422/0008/816
writing DAQ housekeeping data into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/daqhk/1285514805.hk
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1285514805.err
/Data/BLOCKS/RS422/0008/817
Empty ERROR file removed.
writing calibration data into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/cal/1285514826.cal
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1285514826.err
Empty ERROR file removed.
writing configuration data into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/conf/1285514831.conf
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1285514831.err
Empty ERROR file removed.
writing DAQ housekeeping data into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/daqhk/1285514832.hk
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1285514832.err
Empty ERROR file removed.
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1285514833.err
waiting for a new file...
```

Processed files

DAQ House keeping file

Calibration file

Configuration file

DAQ House keeping file

Error file



# TOF shifter guide: blue errors

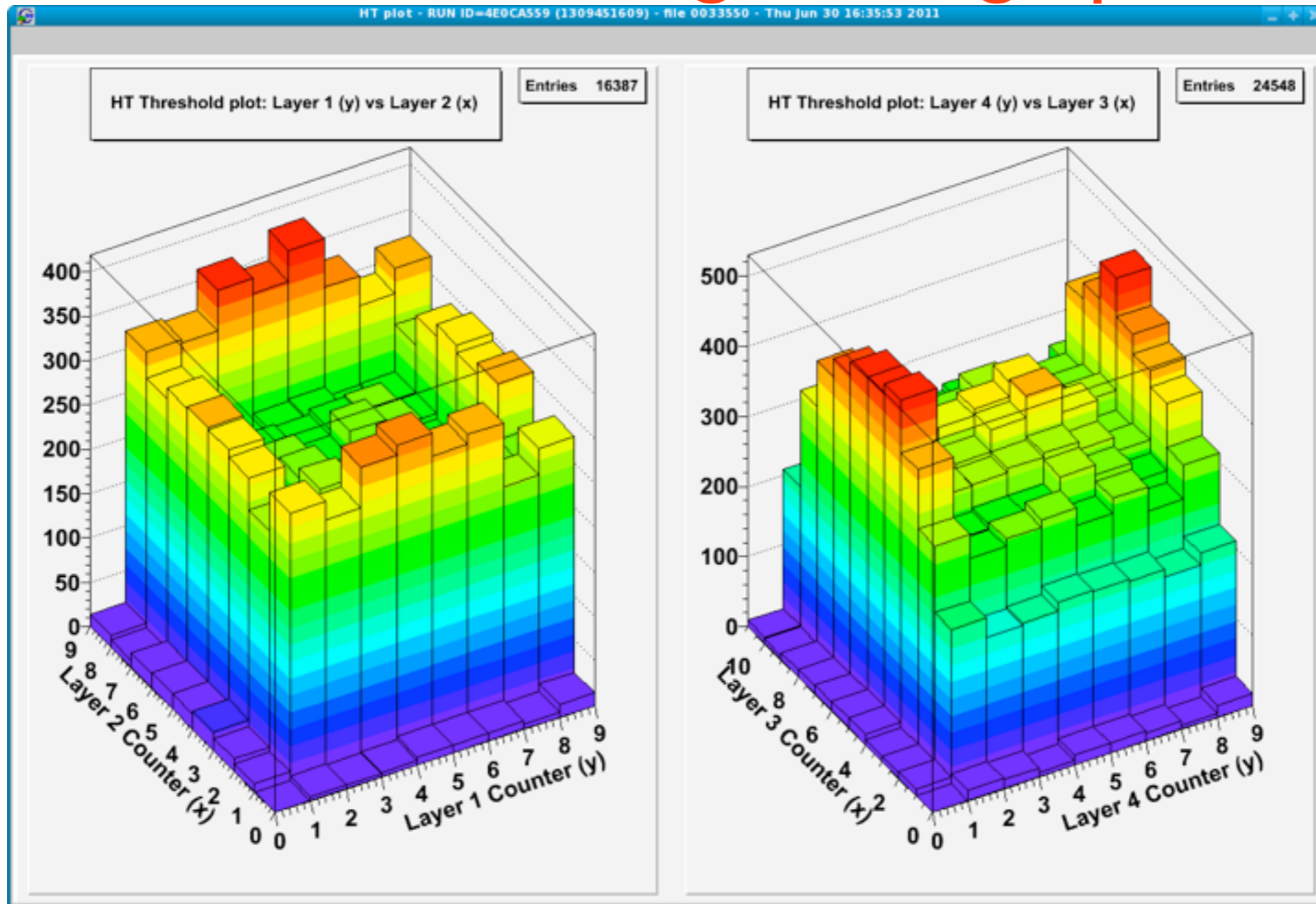


While monitor is running some warnings are highlighted in colored blue lines. The shifter just have to ignore them.

```
tofac@pcpoc27:~/TOF/Monitor2010.v03
=====
RUN: 1309451609 Event from      150688 to      160688
===== ERRORS =====
Hit lost in group 0 from read-out fifo overflow
  S2 SFET2A      7
  S3 SFET2A      4
Hit lost in group 0 from L1 buffer overflow
  S2 SFET2A      2
Hit error have been detected in group 0
  S2 SFET2A      1
Hit lost in group 1 from L1 buffer overflow
  S2 SFET2A      1
Hit rejected because of programmed event size limit
  S2 SFET2C      4
=====
Waiting for a new file...
```



# TOF shifter guide: lego plot



These two histograms give you a global view of the TOF counters, they represent the number of signals that overcome the threshold for the trigger generation.

The left histogram shows the Upper TOF counters, the right histogram shows the Lower TOF counters.

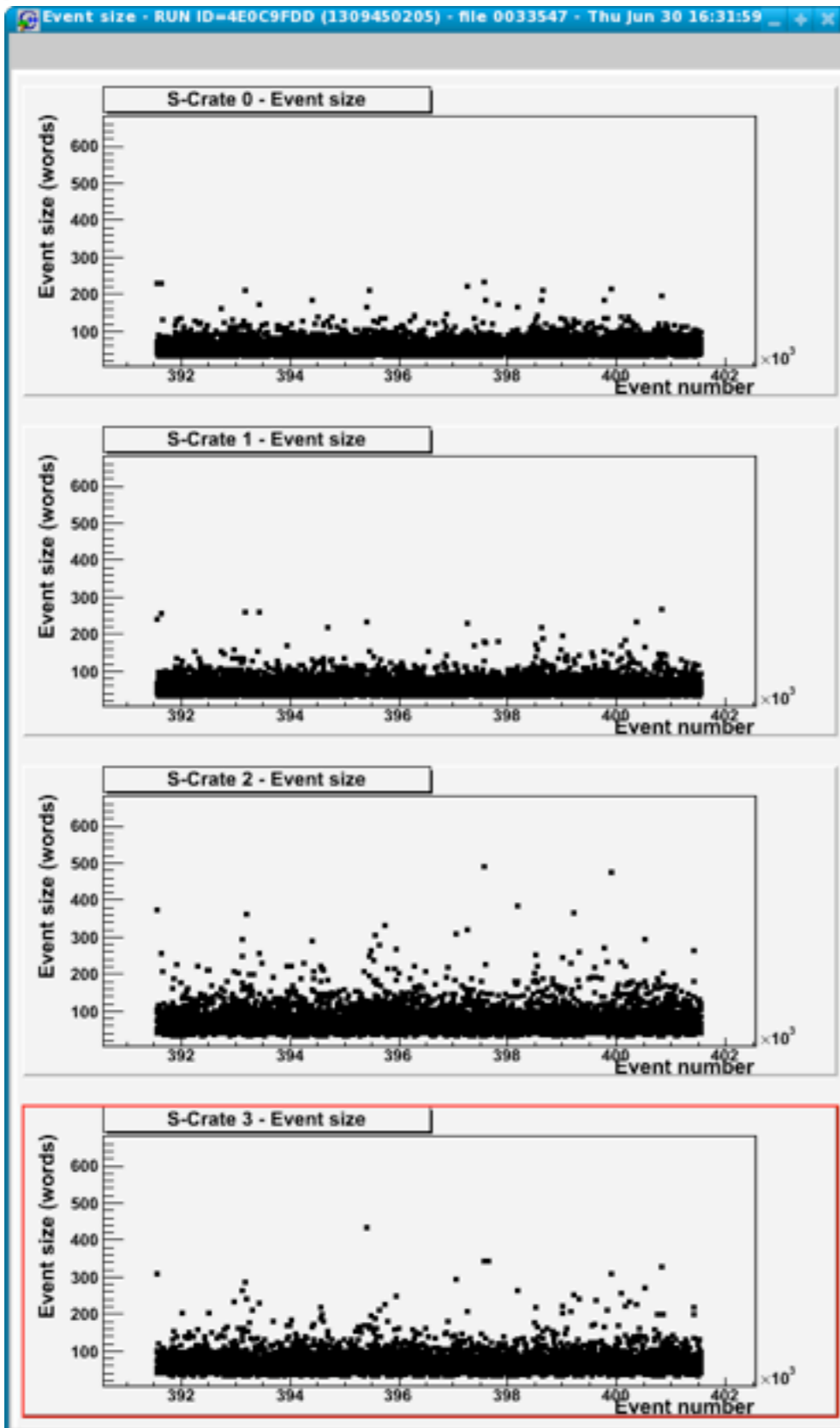
**Shifter duty** the shifter should check that these histograms are not empty.

Data acquired during the SAA shows an abnormal behavior that lasts for a few minutes.





# TOF shifter guide: event size



The Event size shows the number of words acquired from each TOF crates (Crate S0/S1/S2/S3) for each event.

The crate are connected to TOF layers and sides with this scheme:

S0: 1n 2p - layer 1 side n and layer 2 side p

S1: 1p 2n - layer 1 side p and layer 2 side n

S2: 3p 4p - layer 3 side p and layer 4 side p

S3: 3n 4n - layer 3 side n and layer 4 side n

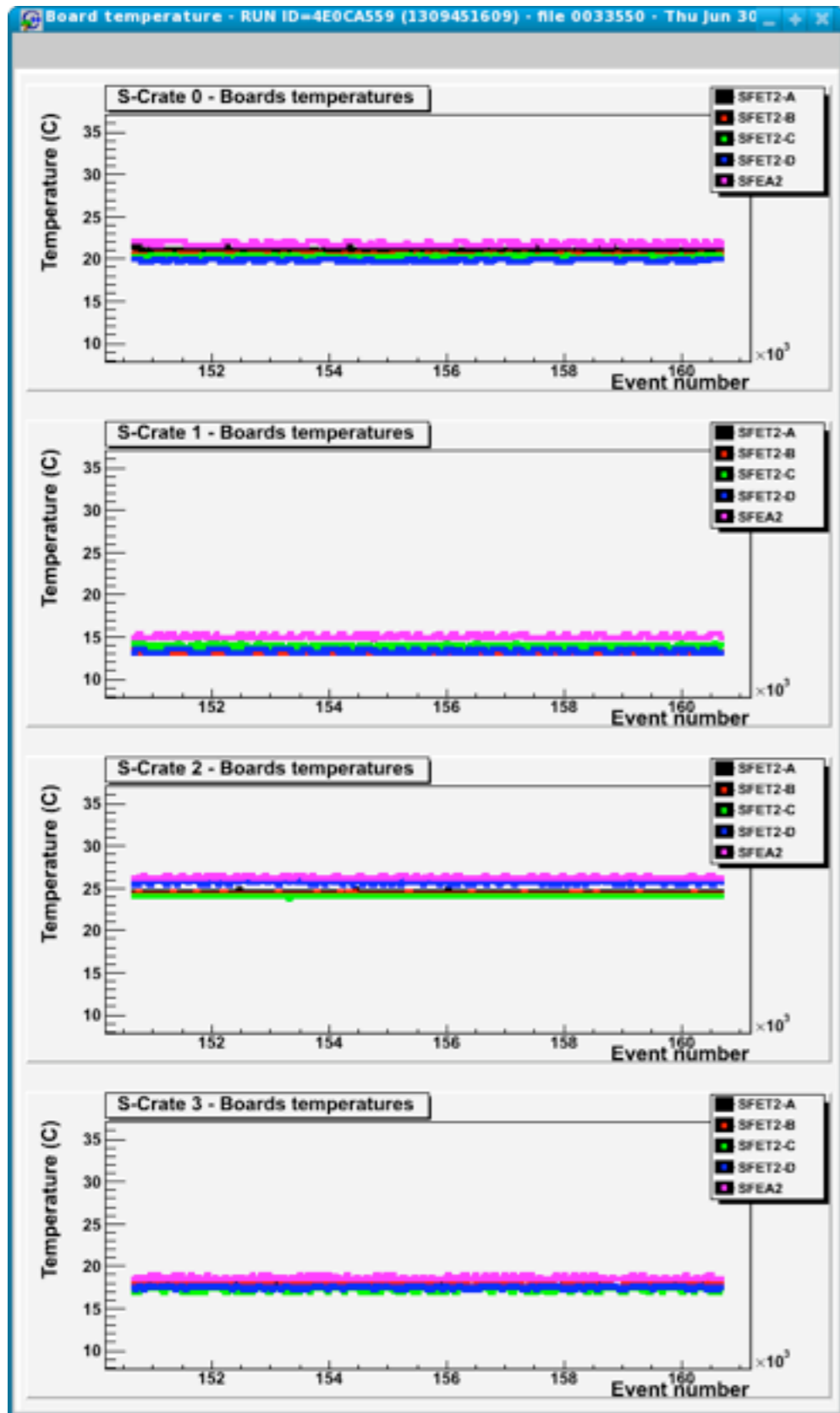
## Shifter duty

the shifter should monitor that:

- ❖ the event size for all the four crates is almost the same with an average value around 100 words as shown in the left.
- ❖ remember that during the SAA the crates event size increase for a few minutes up to 200 - 250 words.



# TOF shifter guide: temperature



In this plot the electronic board temperatures versus the number of event for each of the four TOF crates is monitored.

## Shifter duty

the shifter should check that:

- ❖ In each plot the temperatures from all the electronic boards (SFET2-A/B/C/D and SFEA2) are plotted;
- ❖ The temperatures should be almost similar for all the four crates and inside the working range: between -20C and +50C.

*Note:*

From time to time, some spread isolated spots due to fake measurement could appear.

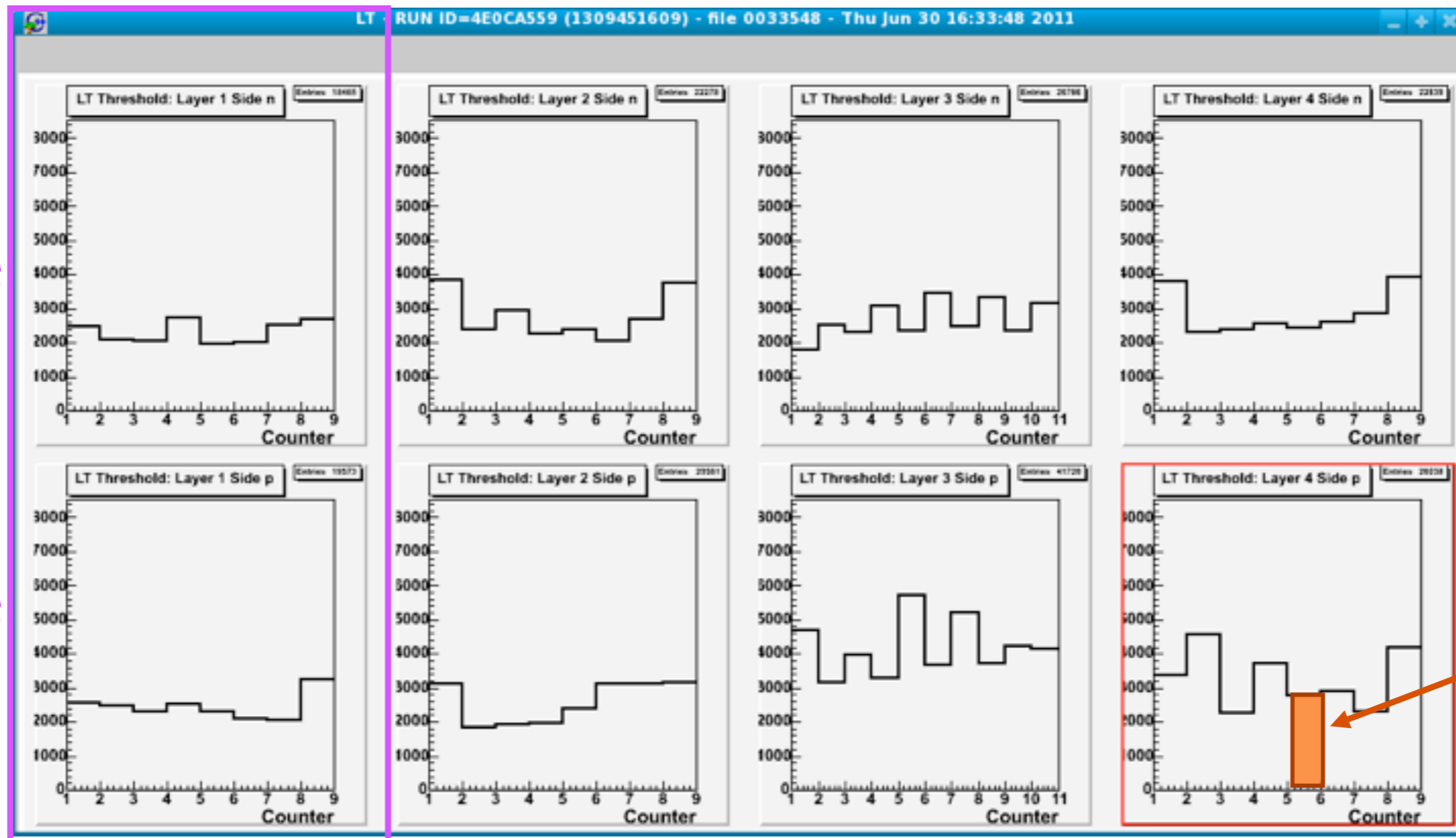


# TOF shifter guide: low thresholds



TOP:  
negative  
counters  
side (n)

Bottom:  
positive  
counters  
side (p)



as example:  
Layer 4  
Counter 5  
positive side (p)

Layer 1                      Layer 2                      Layer 3                      Layer 4

These histograms show the number of times that the signal released by a crossing particle overcome the low thresholds used for the time measurements (number of hits in the TDC) in the TOF.

From left to right each couple of histograms (top and bottom) represent respectively the first, the second, the third and the fourth TOF layer.

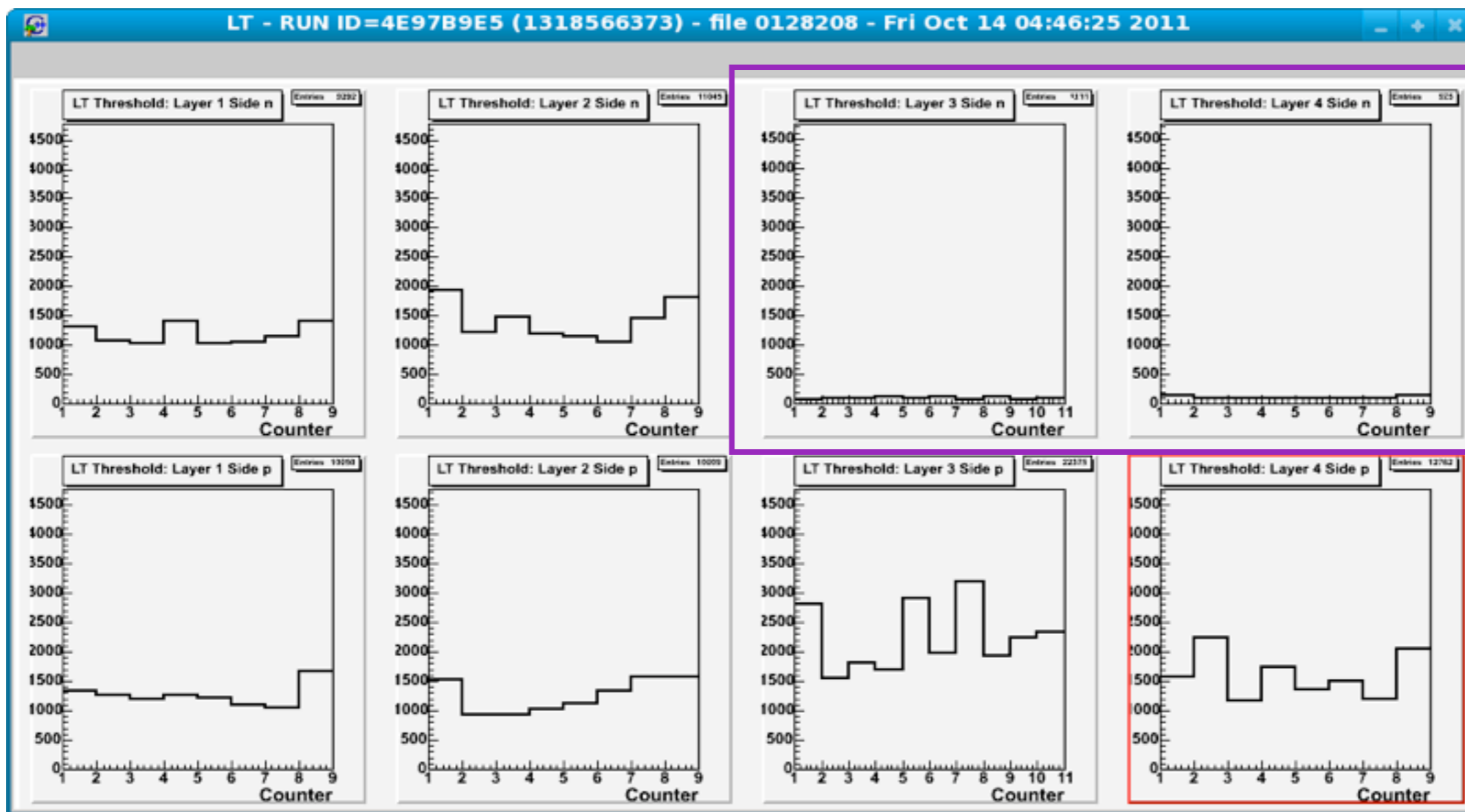
Each histogram represents the number of hits measured in each TOF counter.

### Shifter duty

The shifter has to check that all the counters have some hits. Layers 3 side p and 4 side p, linked to SCrate 2, are usually noisier.



# TOF shifter guide: low thresholds



LT layer 3  
side N  
and  
LT Layer 4  
side N

When LT of layers 3 side n and 4 side n are too low for sometimes it could be an identified bug of the monitor.

PLEASE before calling the expert try to STOP and RESTART the monitor and verify if these two histograms come back to nominal.

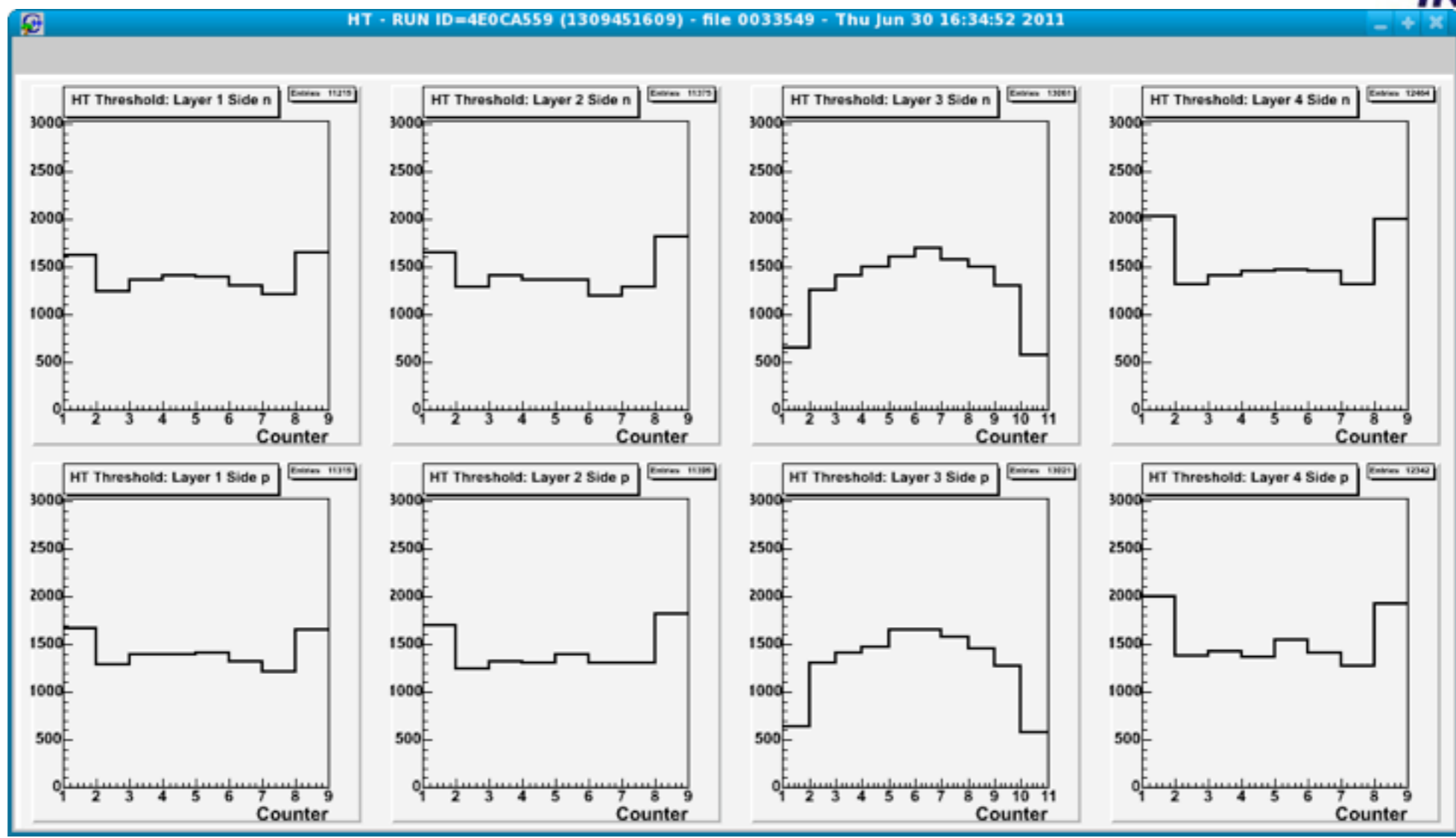


# TOF shifter guide: high thresholds



TOP:  
negative  
counters  
side (n)

Bottom:  
positive  
counters  
side (p)



Layer 1

Layer 2

Layer 3

Layer 4

These histograms show the number of times that the signal released by a crossing particle overcome the high threshold. These signals are used to generate the trigger to AMS.

In each histogram the number of trigger hits in each TOF counter is shown.

In each plot, with the exception of layer 3, the first and last counters have more hits than the internal ones because of their larger surface. In Layer 3, which has 10 counters instead of 8, the first and the last counters are disabled from the AMS physics trigger, that's why they have less hits.

## Shifter duty

The shifter has to check that all the counters are giving some triggers (no holes should be presents).



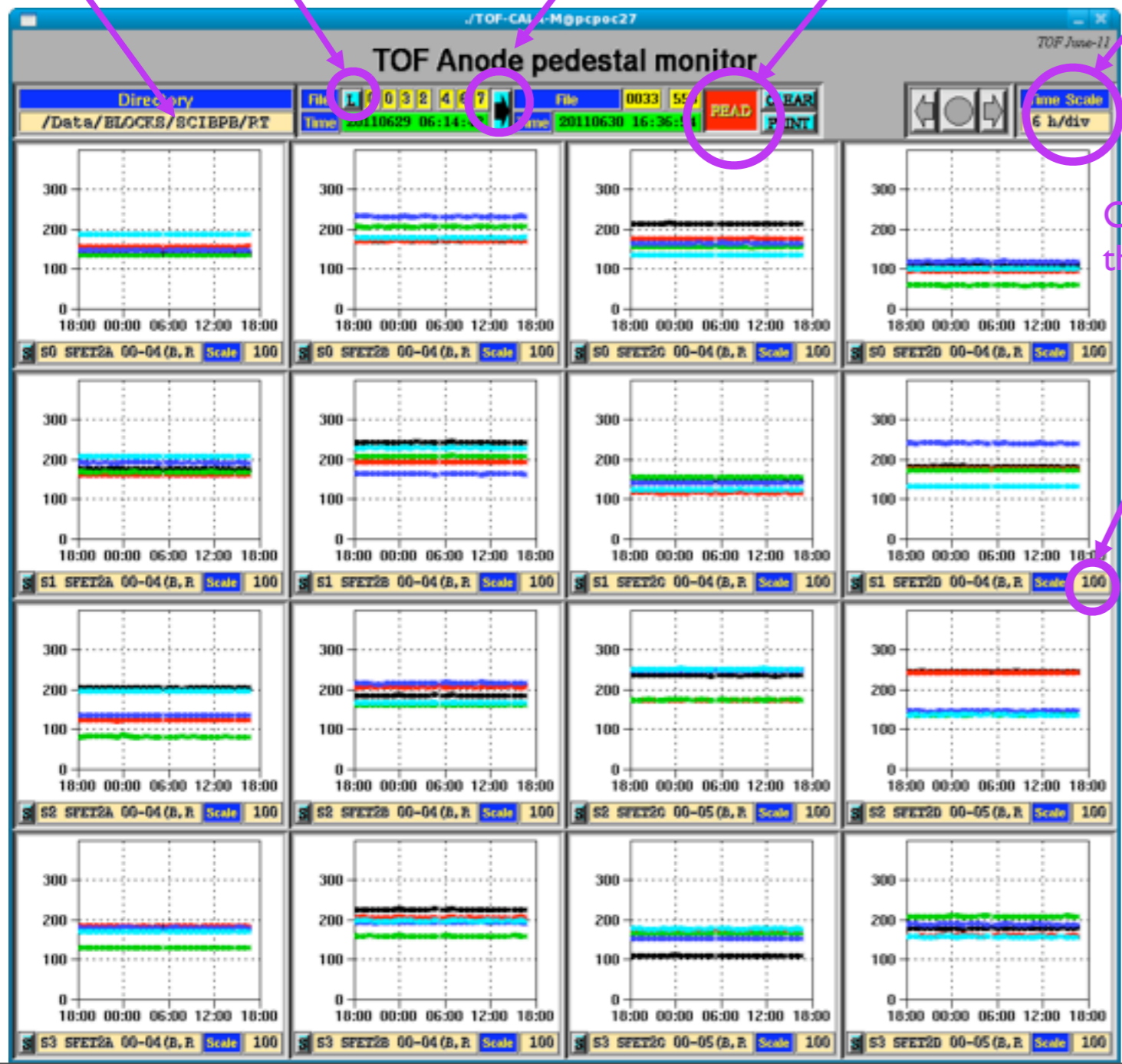


# TOF shifter guide: Anode Monitor



In work space *Data monitor 2* start the Anode Pedestal program.

- 1. Pick the SCI directory
- 2. Press L to find the last file
- 3. Press the arrow to select last file
- 4. Press READ keeping on reading
- Click to change the time scale
- Click to change the vertical scale



Open a terminal window.  
 Go to the directory Qlistmon:  
**cd ~/TOF/Qlistmon**  
 Then digit:  
**TOF-CALA-M &**

The monitor as the one shows in the left is opened.  
 Follow the instructions wrote around the monitor to configure it.

## Shifter duty

Check Anode Pedestal are stable in time.

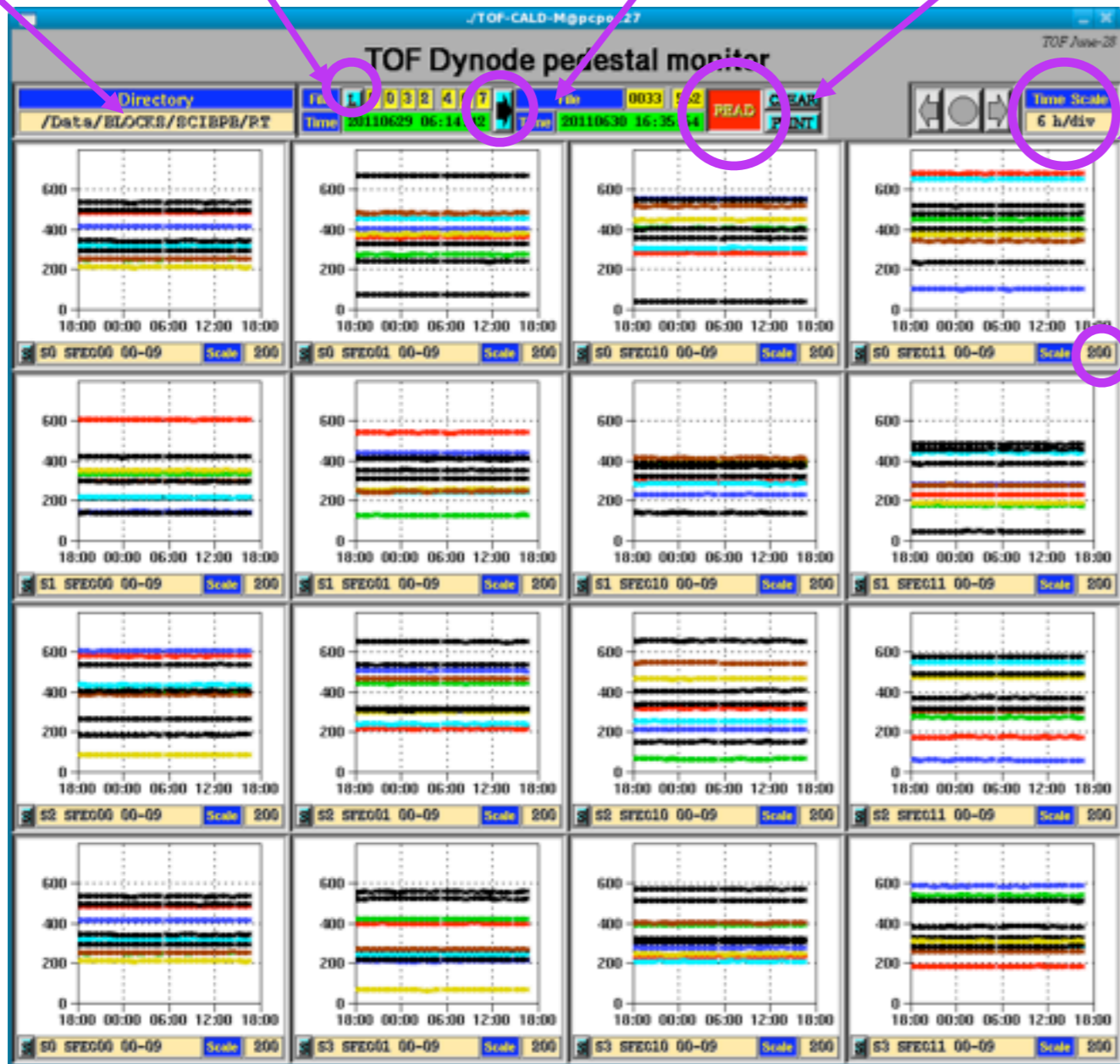


# TOF shifter guide: Dynode Monitor



In work space *Data monitor 2* start the Dynode Pedestal program.

- 1. Pick the SCI directory
- 2. Press L to find the last file
- 3. Press the arrow to select last file
- 4. Press READ keeping on reading



Click to change the time scale

Click to change the vertical scale

Open a terminal window. Go to the directory Qlistmon:

Then digit:

**TOF-CALA-M &**

The monitor as the one shows in the left is opened.

Follow the instructions wrote around the monitor to configure it.

## Shifter duty

Check Dynode Pedestal are stable in time.



# TOF shifter guide: TOF-DTS Monitor



In work space *Data monitor 2* start the TOF Thermal program.

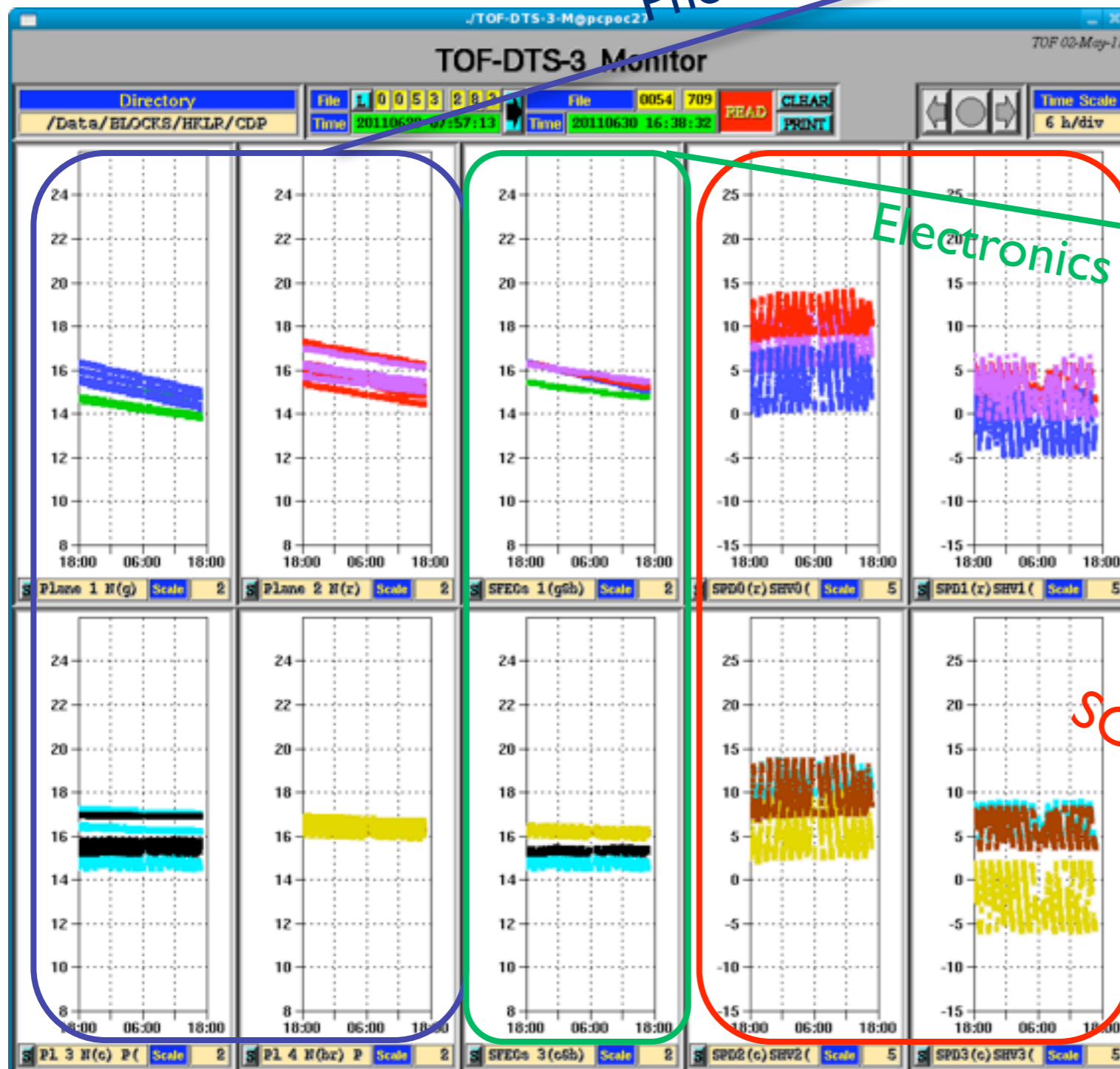
Open a terminal window. Go to the directory Qlistmon:

**cd ~/TOF/Qlistmon**

Then digit:

**TOF-DTS &**

| MIN          | MAX          | Normal |
|--------------|--------------|--------|
| Operative °C | Operative °C | °C     |
| -30          | +35          | 15÷16  |



|      | MIN      | MAX      | Normal |
|------|----------|----------|--------|
|      | Operativ | Operativ |        |
| SFEC | -40      | +80      | 15÷16  |

## Shifter duty

Check TOF temperatures from the monitor are in the operative ranges specified in the table:

| MIN          | MAX          | Normal |
|--------------|--------------|--------|
| Operative °C | Operative °C | °C     |
| -20          | +50          | -5÷15  |



# TOF shifter guide: Housekeeping monitor



Go in the Qlist monitor workspace and open a terminal

**cd ~/TOF/Monitor2010\_hk**

**./monitor /Data/BLOCKS/HKLR/CDP**

**4|308**

**z**

Find a recent hk block and file following the same procedure used for the data monitor see pag 7

Program name

Blocks directory

Directory File

Program option

| 1                   | SPT2 scaler [Hz]  | Thu Jun 30 16:41:27 2011 |             |             |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
|---------------------|---|--------------------------|-------------|-------------|-------------|-------------|------------------|-------------|---------------|-------------|---------------|--------------------|---------------|-------------|-------------|---------------|--------------------|---------------|--------------|---------------|--------------|---------------------|-------------|-------------|-------------|-------------|-----------------|-------------|---------------|---------------|--------------|-----------------|-------------|-------------|-------------|-------------|-------------------|-------------|---------------|------|--------------|-------------------|------|------|------|------|-------------------|------|------|------|------|-------------------|------|------|------|------|------------------|------|------|------|------|-----------------|------|------|------|------|----------------|------|------|------|------|--|
|                     | <table border="1"> <thead> <tr> <th>1n</th><th>2n</th><th>3n</th><th>4n</th><th>5n</th><th>6n</th><th>7n</th><th>8n</th> <th>1p</th><th>2p</th><th>3p</th><th>4p</th><th>5p</th><th>6p</th><th>7p</th><th>8p</th> <th>1n</th><th>2n</th><th>3n</th><th>4n</th><th>5n</th><th>6n</th><th>7n</th><th>8n</th> <th>1p</th><th>2p</th><th>3p</th><th>4p</th><th>5p</th><th>6p</th><th>7p</th><th>8p</th> <th>1n</th><th>2n</th><th>3n</th><th>4n</th><th>5n</th><th>6n</th><th>7n</th><th>8n</th> <th>1p</th><th>2p</th><th>3p</th><th>4p</th><th>5p</th><th>6p</th><th>7p</th><th>8p</th> <th>1n</th><th>2n</th><th>3n</th><th>4n</th><th>5n</th><th>6n</th><th>7n</th><th>8n</th> <th>1p</th><th>2p</th><th>3p</th><th>4p</th><th>5p</th><th>6p</th><th>7p</th><th>8p</th> </tr> </thead> </table>   | 1n                       | 2n          | 3n          | 4n          | 5n          | 6n               | 7n          | 8n            | 1p          | 2p            | 3p                 | 4p            | 5p          | 6p          | 7p            | 8p                 | 1n            | 2n           | 3n            | 4n           | 5n                  | 6n          | 7n          | 8n          | 1p          | 2p              | 3p          | 4p            | 5p            | 6p           | 7p              | 8p          | 1n          | 2n          | 3n          | 4n                | 5n          | 6n            | 7n   | 8n           | 1p                | 2p   | 3p   | 4p   | 5p   | 6p                | 7p   | 8p   | 1n   | 2n   | 3n                | 4n   | 5n   | 6n   | 7n   | 8n               | 1p   | 2p   | 3p   | 4p   | 5p              | 6p   | 7p   | 8p   |      |                |      |      |      |      |  |
| 1n                  | 2n  | 3n                       | 4n          | 5n          | 6n          | 7n          | 8n               | 1p          | 2p            | 3p          | 4p            | 5p                 | 6p            | 7p          | 8p          | 1n            | 2n                 | 3n            | 4n           | 5n            | 6n           | 7n                  | 8n          | 1p          | 2p          | 3p          | 4p              | 5p          | 6p            | 7p            | 8p           | 1n              | 2n          | 3n          | 4n          | 5n          | 6n                | 7n          | 8n            | 1p   | 2p           | 3p                | 4p   | 5p   | 6p   | 7p   | 8p                | 1n   | 2n   | 3n   | 4n   | 5n                | 6n   | 7n   | 8n   | 1p   | 2p               | 3p   | 4p   | 5p   | 6p   | 7p              | 8p   |      |      |      |                |      |      |      |      |  |
| 2                   | Dallas Sensor Temperatures [°C]   | Thu Jun 30 16:40:53 2011 |             |             |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
|                     | <table border="1"> <thead> <tr> <th>TOF-1 SFEC_00</th><th>TOF-1 106n1</th><th>TOF-1 104n1</th><th>TOF-1 102n1</th><th>TOF-1 108p2</th><th>TOF-1 106p2</th><th>TOF-1 104p2</th><th>TOF-1 SFEC_10</th><th>SHV0</th><th>SPD0 (TSPD1)</th> <th>TOF-2 208n2</th><th>TOF-2 SFEC_11</th><th>TOF-2 204n1</th><th>TOF-2 201n1</th><th>TOF-2 208p2</th><th>TOF-2 204p1</th><th>TOF-2 SFEC_01</th><th>TOF-2 201p1</th><th>SHV1</th><th>SPD1 (TSPD3)</th> <th>TOF-3 SFEC_30</th><th>TOF-3 302n1</th><th>TOF-3 305n2</th><th>TOF-3 309n2</th><th>TOF-3 301p2</th><th>TOF-3 305p2</th><th>TOF-3 309p2</th><th>TOF-3 SFEC_20</th><th>SHV2</th><th>SPD2 (TSPD4)</th> <th>TOF-4 SFEC_31</th><th>TOF-4 402n2</th><th>TOF-4 404n2</th><th>TOF-4 406n2</th><th>TOF-4 401p1</th><th>TOF-4 404p1</th><th>TOF-4 406p1</th><th>TOF-4 SFEC_21</th><th>SHV3</th><th>SPD3 (TSPD6)</th> </tr> </thead> </table>   | TOF-1 SFEC_00            | TOF-1 106n1 | TOF-1 104n1 | TOF-1 102n1 | TOF-1 108p2 | TOF-1 106p2      | TOF-1 104p2 | TOF-1 SFEC_10 | SHV0        | SPD0 (TSPD1)  | TOF-2 208n2        | TOF-2 SFEC_11 | TOF-2 204n1 | TOF-2 201n1 | TOF-2 208p2   | TOF-2 204p1        | TOF-2 SFEC_01 | TOF-2 201p1  | SHV1          | SPD1 (TSPD3) | TOF-3 SFEC_30       | TOF-3 302n1 | TOF-3 305n2 | TOF-3 309n2 | TOF-3 301p2 | TOF-3 305p2     | TOF-3 309p2 | TOF-3 SFEC_20 | SHV2          | SPD2 (TSPD4) | TOF-4 SFEC_31   | TOF-4 402n2 | TOF-4 404n2 | TOF-4 406n2 | TOF-4 401p1 | TOF-4 404p1       | TOF-4 406p1 | TOF-4 SFEC_21 | SHV3 | SPD3 (TSPD6) |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| TOF-1 SFEC_00       | TOF-1 106n1   | TOF-1 104n1              | TOF-1 102n1 | TOF-1 108p2 | TOF-1 106p2 | TOF-1 104p2 | TOF-1 SFEC_10    | SHV0        | SPD0 (TSPD1)  | TOF-2 208n2 | TOF-2 SFEC_11 | TOF-2 204n1        | TOF-2 201n1   | TOF-2 208p2 | TOF-2 204p1 | TOF-2 SFEC_01 | TOF-2 201p1        | SHV1          | SPD1 (TSPD3) | TOF-3 SFEC_30 | TOF-3 302n1  | TOF-3 305n2         | TOF-3 309n2 | TOF-3 301p2 | TOF-3 305p2 | TOF-3 309p2 | TOF-3 SFEC_20   | SHV2        | SPD2 (TSPD4)  | TOF-4 SFEC_31 | TOF-4 402n2  | TOF-4 404n2     | TOF-4 406n2 | TOF-4 401p1 | TOF-4 404p1 | TOF-4 406p1 | TOF-4 SFEC_21     | SHV3        | SPD3 (TSPD6)  |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| 3                   | DAQ Housekeeping  | Thu Jun 30 16:35:46 2011 |             |             |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
|                     | <table border="1"> <thead> <tr> <th></th><th>S0</th><th>S1</th><th>S2</th><th>S3</th> </tr> </thead> <tbody> <tr><td>Node Status word</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>Calibration Status</td><td>4000</td><td>4000</td><td>4000</td><td>4000</td></tr> <tr><td>Power Monitor word</td><td>7FFF</td><td>7FFF</td><td>7FFF</td><td>7FFF</td></tr> <tr><td>S-Crate Status word</td><td>C07F</td><td>C07F</td><td>C07F</td><td>C07F</td></tr> <tr><td>SDR2 Error Code</td><td>4000</td><td>4000</td><td>4000</td><td>4000</td></tr> <tr><td>SPT2 Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SFET2A Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SFET2B Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SFET2C Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SFET2D Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SFEA2 Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> <tr><td>SHV Status word</td><td>7D00</td><td>7D00</td><td>7D00</td><td>7D00</td></tr> <tr><td>SHV Error Code</td><td>0000</td><td>0000</td><td>0000</td><td>0000</td></tr> </tbody> </table> |                          | S0          | S1          | S2          | S3          | Node Status word | 0000        | 0000          | 0000        | 0000          | Calibration Status | 4000          | 4000        | 4000        | 4000          | Power Monitor word | 7FFF          | 7FFF         | 7FFF          | 7FFF         | S-Crate Status word | C07F        | C07F        | C07F        | C07F        | SDR2 Error Code | 4000        | 4000          | 4000          | 4000         | SPT2 Error Code | 0000        | 0000        | 0000        | 0000        | SFET2A Error Code | 0000        | 0000          | 0000 | 0000         | SFET2B Error Code | 0000 | 0000 | 0000 | 0000 | SFET2C Error Code | 0000 | 0000 | 0000 | 0000 | SFET2D Error Code | 0000 | 0000 | 0000 | 0000 | SFEA2 Error Code | 0000 | 0000 | 0000 | 0000 | SHV Status word | 7D00 | 7D00 | 7D00 | 7D00 | SHV Error Code | 0000 | 0000 | 0000 | 0000 |  |
|                     | S0  | S1                       | S2          | S3          |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| Node Status word    | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| Calibration Status  | 4000  | 4000                     | 4000        | 4000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| Power Monitor word  | 7FFF  | 7FFF                     | 7FFF        | 7FFF        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| S-Crate Status word | C07F  | C07F                     | C07F        | C07F        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SDR2 Error Code     | 4000  | 4000                     | 4000        | 4000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SPT2 Error Code     | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SFET2A Error Code   | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SFET2B Error Code   | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SFET2C Error Code   | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SFET2D Error Code   | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SFEA2 Error Code    | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SHV Status word     | 7D00  | 7D00                     | 7D00        | 7D00        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |
| SHV Error Code      | 0000  | 0000                     | 0000        | 0000        |             |             |                  |             |               |             |               |                    |               |             |             |               |                    |               |              |               |              |                     |             |             |             |             |                 |             |               |               |              |                 |             |             |             |             |                   |             |               |      |              |                   |      |      |      |      |                   |      |      |      |      |                   |      |      |      |      |                  |      |      |      |      |                 |      |      |      |      |                |      |      |      |      |  |



# TOF shifter guide:



## Housekeeping monitor red errors

- **The first tabular** in the previous page shows the rate of the particles crossing each TOF layer and side.
- **The second tabular** shows the exact value of the temperatures read by the Dallas sensors and plotted in the monitor described at pag 19.
- **The third tabular** is the most important for the shifter. It shows words containing the status of each TOF&ACC electronics boards and the High Voltage Brick for each crate (S0, S1, S2 and S3).

When errors occur the third tabular shows red line as shown below:

|                     | S0   | S1   | S2   | S3   |
|---------------------|------|------|------|------|
| Node Status word    | 0000 | 0000 | 0000 | 0000 |
| Calibration Status  | 4000 | 4000 | 4000 | 4000 |
| Power Monitor word  | 7FFF | 7FFF | 7FFF | 7FFF |
| S-Crate Status word | FB7F | FB7F | FB7F | FB7F |
| SDR2 Error Code     | 0000 | 0000 | 0000 | 0000 |
| SPT2 Error Code     | 0000 | 0000 | 0000 | 0000 |
| SFET2A Error Code   | 0001 | 0001 | 0001 | 0001 |
| SFET2B Error Code   | 0001 | 0001 | 0001 | 0001 |
| SFET2C Error Code   | 0001 | 0001 | 0001 | 0001 |
| SFET2D Error Code   | 0001 | 0001 | 0001 | 0001 |
| SFEA2 Error Code    | 0001 | 0001 | 0001 | 0001 |
| SHV Status word     | 7D00 | 7D00 | 7D00 | 7D00 |
| SHV Error Code      | 0000 | 0000 | 0000 | 0000 |

### Shifter duty

The shifter must verify that there are not red lines that represent errors. If there are errors see the instructions at the following pages.



# TOF shifter guide: Housekeeping monitor red errors:



```

tofac@pcpoc27:/nfs_mnt/pocchome/tofac/TOF/Monitor2010_hk
/Data/BLOCKS/HKLR/CDP/0206/315

SPT2 scaler [Hz]                               Sun Nov 20 14:27:01 2011
+-Lay 1N---HT---SHT+-Lay 1P---HT---SHT+-Lay 2N---HT---SHT+-Lay 2P---HT---SHT+-Lay 3N---HT---SHT+-Lay 3P---HT---SHT+-Lay 4N---HT---SHT+-Lay 4P---HT---SHT+-
1n    611  114 | 1p    638  126 | 1n    624  141 | 1p    665  159 | 1n    607  187 | 1p    675  202 | 1n    964  251 | 1p    919  257 |
2n    433   84 | 2p    473  121 | 2n    469  192 | 2p    441  118 | 2n    507  139 | 2p    541  211 | 2n    559  159 | 2p    598  216 |
3n    441  112 | 3p    477  176 | 3n    545  241 | 3p    488  102 | 3n    573  193 | 3p    547  142 | 3n    560  160 | 3p    635  236 |
4n    516  176 | 4p    462   90 | 4n    509  150 | 4p    442   74 | 4n    594  159 | 4p    540  118 | 4n    594  213 | 4p    581  140 |
5n    438  105 | 5p    434  145 | 5n    506  137 | 5p    538  184 | 5n    594  149 | 5p    661  253 | 5n    553  152 | 5p    648  306 |
6n    415   79 | 6p    426  105 | 6n    419   95 | 6p    532  168 | 6n    625  195 | 6p    590  150 | 6n    597  224 | 6p    591  187 |
7n    411   72 | 7p    420   97 | 7n    480  118 | 7p    509  142 | 7n    562  119 | 7p    605  188 | 7n    564  207 | 7p    524  155 |
8n    623  126 | 8p    613   91 | 8n    671  206 | 8p    689  236 | 8n    536  148 | 8p    552  158 | 8n    860  214 | 8p    813  199 |
          |          |          |          | 9n    510  172 | 9p    497  125 |          |          |
          |          |          |          | 10n   594  144 | 10p   588  181 |          |          |

-----
Dallas Sensor Temperatures [°C]                Sun Nov 20 14:26:08 2011
-----
TOF-1 SFEC_00      18.2 | TOF-2 208n2      16.9 | TOF-3 SFEC_30      24.1 | TOF-4 SFEC_31      26.0 |
TOF-1 106n1       17.2 | TOF-2 SFEC_11    17.5 | TOF-3 302n1        24.5 | TOF-4 402n2        26.1 |
TOF-1 104n1       17.3 | TOF-2 204n1      18.6 | TOF-3 305n2        25.0 | TOF-4 404n2        25.7 |
TOF-1 102n1       17.5 | TOF-2 201n1      18.0 | TOF-3 309n2        24.1 | TOF-4 406n2        26.0 |
TOF-1 108p2       15.9 | TOF-2 208p2      16.2 | TOF-3 301p2        24.9 | TOF-4 401p1        24.1 |
TOF-1 106p2       16.1 | TOF-2 204p1      17.2 | TOF-3 305p2        25.4 | TOF-4 404p1        24.4 |
TOF-1 104p2       16.6 | TOF-2 SFEC_01    16.8 | TOF-3 309p2        24.2 | TOF-4 406p1        24.7 |
TOF-1 SFEC_10     17.1 | TOF-2 201p1      16.9 | TOF-3 SFEC_20      24.0 | TOF-4 SFEC_21      24.3 |
SHV0              10.0 | SHV1             -4.8 | SHV2              11.8 | SHV3              -4.7 |
SPD0 (TSPD1)     18.3 | SPD1 (TSPD3)     1.6  | SPD2 (TSPD4)      17.7 | SPD3 (TSPD6)      6.0 |

-----
DAQ Housekeeping                               Sun Nov 20 14:23:53 2011
-----
Node Status word   0000 | S0              0000 | S1              0000 | S2              0000 | S3              0000 |
Calibration Status 9000 | Def: 4000      9000 | Def: 4000      9000 | Def: 4000      9000 | Def: 4000      9000 |
Power Monitor word 7FFF |                7FFF |                7FFF |                7FFF |                7FFF |
S-Crate Status word 447F | Def: C07F     447F | Def: C07F     447F | Def: C07F     447F | Def: C07F     447F |
SDR2 Error Code    0000 |                0000 |                0000 |                0000 |                0000 |
SPT2 Error Code    4001 | Def: 0000     4001 | Def: 0000     4001 | Def: 0000     4001 | Def: 0000     4001 |
SFET2A Error Code  0000 |                0000 |                0000 |                0000 |                0000 |
SFET2B Error Code  0000 |                0000 |                0000 |                0000 |                0000 |
SFET2C Error Code  0000 |                0000 |                0000 |                0000 |                0000 |
SFET2D Error Code  0000 |                0000 |                0000 |                0000 |                0000 |
SFEA2 Error Code   0000 |                0000 |                0000 |                0000 |                0000 |
SHV Status word    7D00 |                7D00 |                7D00 |                7D00 |                7D00 |
SHV Error Code     0000 |                0000 |                0000 |                0000 |                0000 |

writing output into /nfs_mnt/pocchome/tofac/TOF/Monitor2010_hk/monitorw.txt
waiting for a new file...

```

If there are red errors are in all the S0, S1, S2 and S3 crates and if these errors are:  
 Calibration status = 8000 or 9000, SDR2 error = 447f and SPT2 error = 4001.  
 Then: They are not errors; please wait till next AMS calibration and they will disappear.



# TOF shifter guide:



## Housekeeping monitor red errors

In case of a red error not related to the calibration (different from the ones showed at pag 22), wait the start of a new run to see if it disappears. If the read error is still there take a screenshot of the errors and add it in the elog.

Then call the TOF expert.

TOF expert ON CALL could decide to allow the shifter to execute the **recovery scripts**:

### Follow this procedure **STEP I**:

- 1) Ask to the lead to stop the run when it's possible
- 2) when the run is stopped, execute the script

```
$ cd ~/TOF/BBtools
```

```
$ ./reload_configuration_SDR.sh [crate] [side] [day] [month] [year]
```

Where:

[crate] = 0,1,2,3. You have to insert the crate which has a red error

[side] = a or b. You can see the side in the ELOG. Usually side a is power on

[day] = you have to insert the number of the current day

[month] = you have to insert the number of the current month

[year] = you have to insert the last two digit of the current year

*Example: ./reload\_configuration\_SDR.sh 2 a 5 2 11*

- 3) Restart the run and verify there are not errors.

If the red error is still there after the procedure Step I, see the next page.



# TOF shifter guide: Housekeeping monitor red errors



If the red error is still there after the execution of the procedure Step 1:

```
$ ls -ltr *.txt
```

Upload in the elog the last file SDR2-[crate]-[side]\_reload\_[day][month][year].txt.

Then call the TOF expert.

With the TOF expert at the phone

## Follow the procedure STEP 2:

1) Ask to the lead to stop the run when it's possible

2) when the run is stopped, execute the script

```
$ cd ~/TOF/BBtools
```

```
$ ./reboot_configuration_SDR.sh [crate] [side] [day] [month] [year]
```

Where:

[crate] = 0,1,2,3. You have to insert the crate which has a red error

[side] = a or b. You can see the side in the ELOG. Usually side a is power on

[day] = you have to insert the number of the current day

[month] = you have to insert the number of the current month

[year] = you have to insert the last two digit of the current year

Example: ./reboot\_configuration\_SDR.sh 2 a 5 2 11

3) Restart the run and verify there are not errors.

If the red error is still there:

```
$ ls -ltr *.txt
```

Upload in the elog the last file SDR2-[crate]-[side]\_reload\_[day][month][year].txt.

Then call the expert!