The Time of Flight detector of the AMS-02: commanding programs and monitoring tools

Lecture 3

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for TOF collaboration

Outline

- The TOF software tools
- TOF commanding programs
- Software to configure the TOF parameters
- TOF online monitor
- Calibration, Configuration and house keeping monitors
- TOF physical event monitor
- Errors monitor
- TOF slow control monitors

TOF software tools

TOF is configured and monitored using several software.

Commanding/Configuration:
- BBtool is a software used to communicate and send commands to S-crates.

- SDR2, SPT2, SFET2, Brick command interfaces are used to send direct commands to TOF boards and SHV bricks.

- AMSTOF_configuration used to generate TOF configuration file in a format compatible with the DSP program.

Monitor:
- *Slow control*
PDS-M, JLV1-M, SPT2-M and TOF-DTS-M are used to monitor TOF input currents, trigger signals and temperatures…

- *DAQ*
TOF online monitor is used during data acquisition to verify TOF configuration and data quality.

Commanding of the TOF electronics

BBdaq (Bare Bones DAQ)

This software is used to perform various low level operations with the TOF electronics.

Boot the node, get the status ...
Write/read/load/delete a DSP program or configuration file in the memory flash, retrieve the house keeping information, the configuration...and other useful Sub-Detector Procedures have been implemented for the TOF.

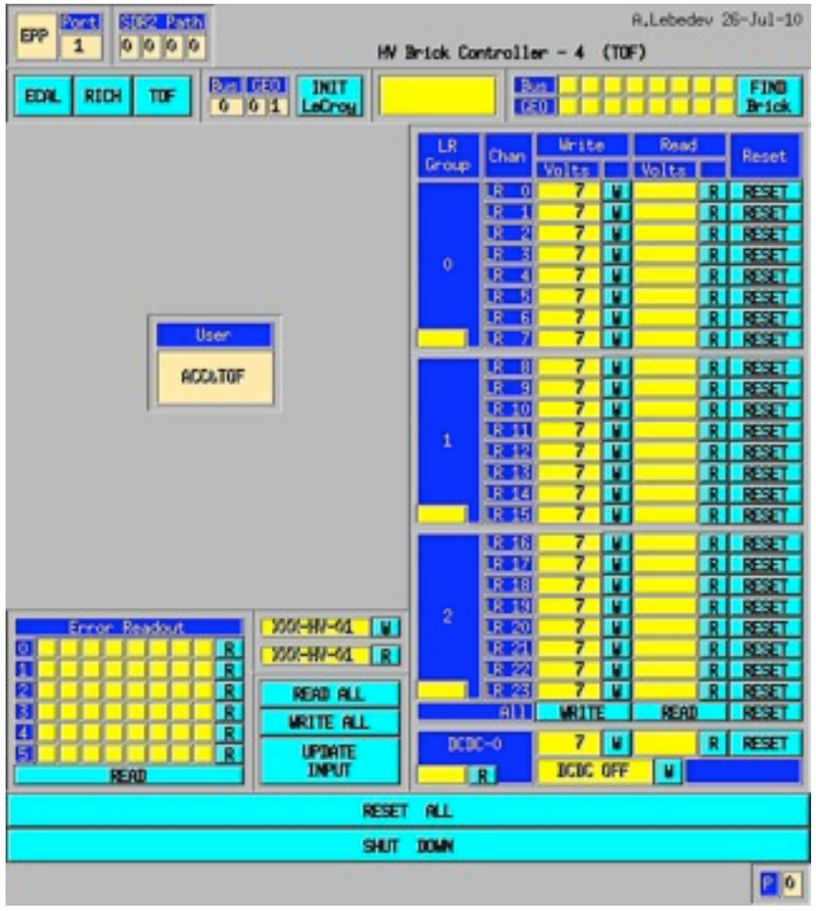
In BBdaq it's possible to use macro to execute sequentially commands addressed to different nodes.

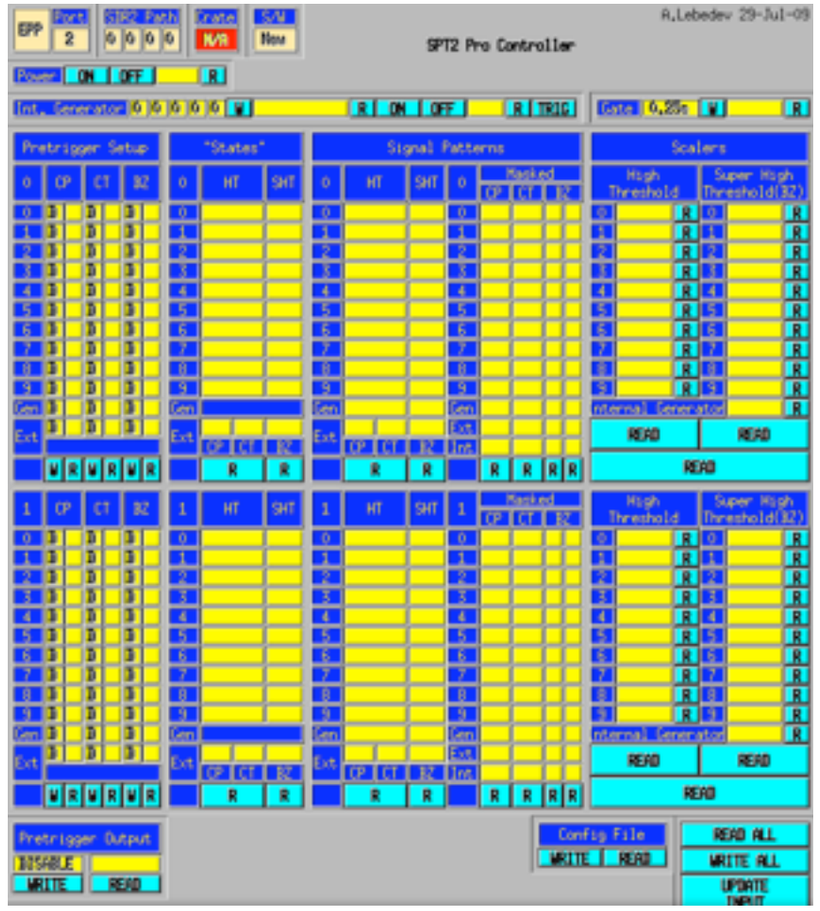
```
DAQ>> sdr 0 a
DAQ/SDR2-0-A (CMD FILE)>> ?
------------------------------------------------------------
                                        SDR-2 Menu

 1  [BOOT]              Boot the node
 2  [STATUS]            Get the node status
 3  [PING]              Ping the node
 4  [PWRDOWN]           Enter power down
 5  [FLASHRD]           Read a file from FLASH
 6  [FLASHWR]           Write a file to FLASH
 7  [FLASHTST]          Test a file in the FLASH
 8  [FLASHLD]           Load a FLASH file
 9  [FLASHDIR]          Read FLASH summary
10  [FLASHERASE]        Flash file/sector erase
11  [FLASHDF]           File Attribute Set
12  [-]                 -
13  [HKINFORD]          Read HK info
14  [CALSTATUS]         Read Calibration Status
15  [CALCNTRL]          Perform Calibration
16  [SDPRORD]           SD procedure status
17  [-]                 -
18  [-]                 -
19  [-]                 -
20  [WAIT]              Let the program wait
21  [RETURN]            Back to DAQ Menu

DAQ/SDR2-0-A (CMD FILE)>>
```

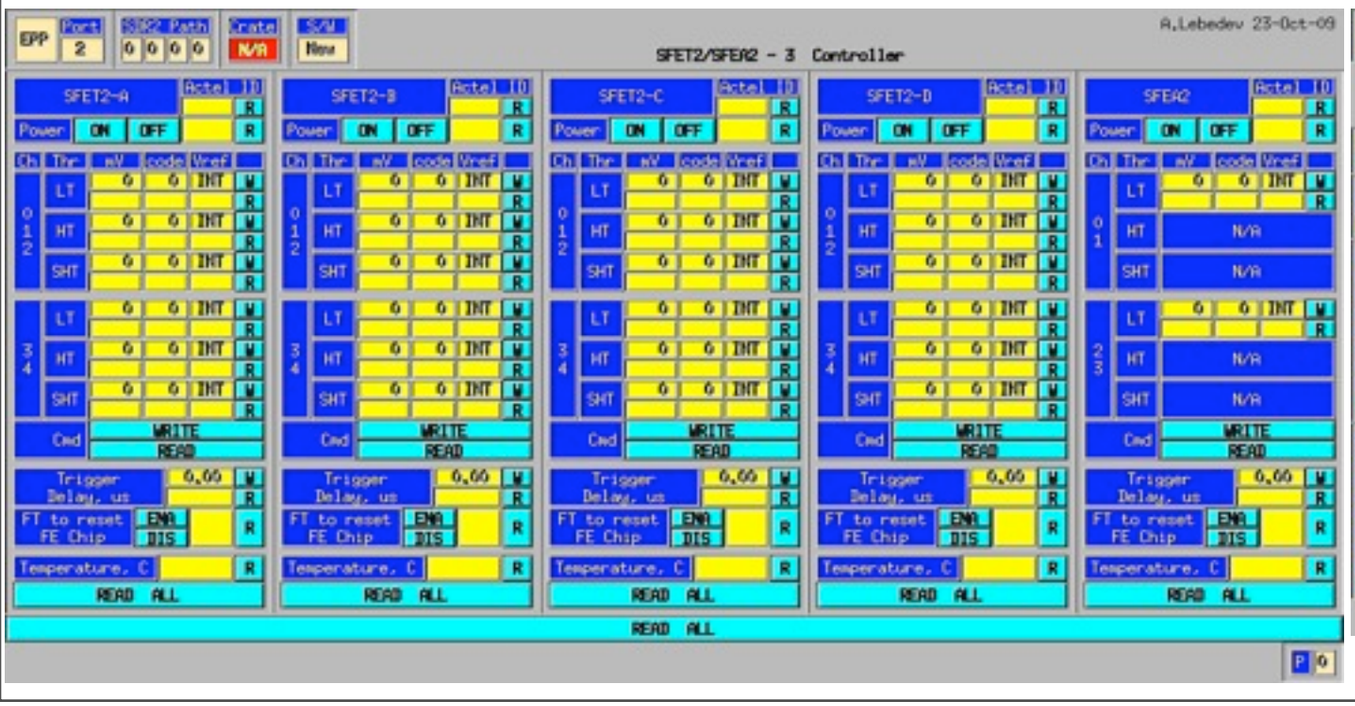
Commanding of the TOF electronics

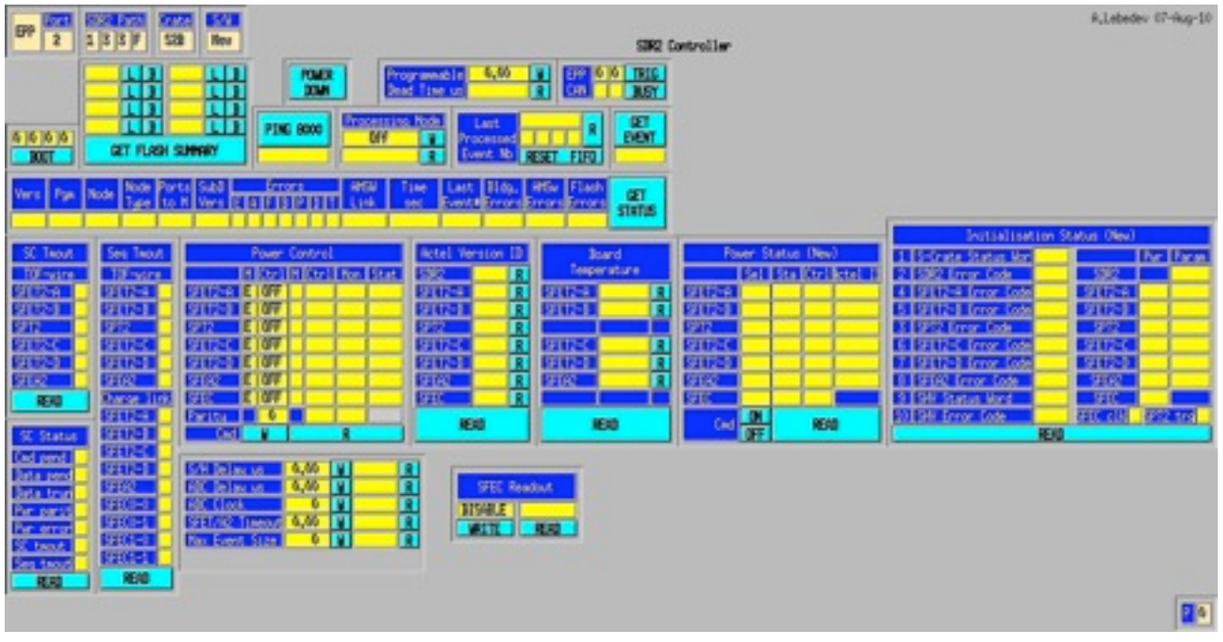
Slow control SDR2, SPT2, SFET2/SFEA2, HVBrick controllers.

These graphical interfaces are used to send specific AMSwire commands directly to TOF & ACC nodes, to set and read back a register or a group of registers value.

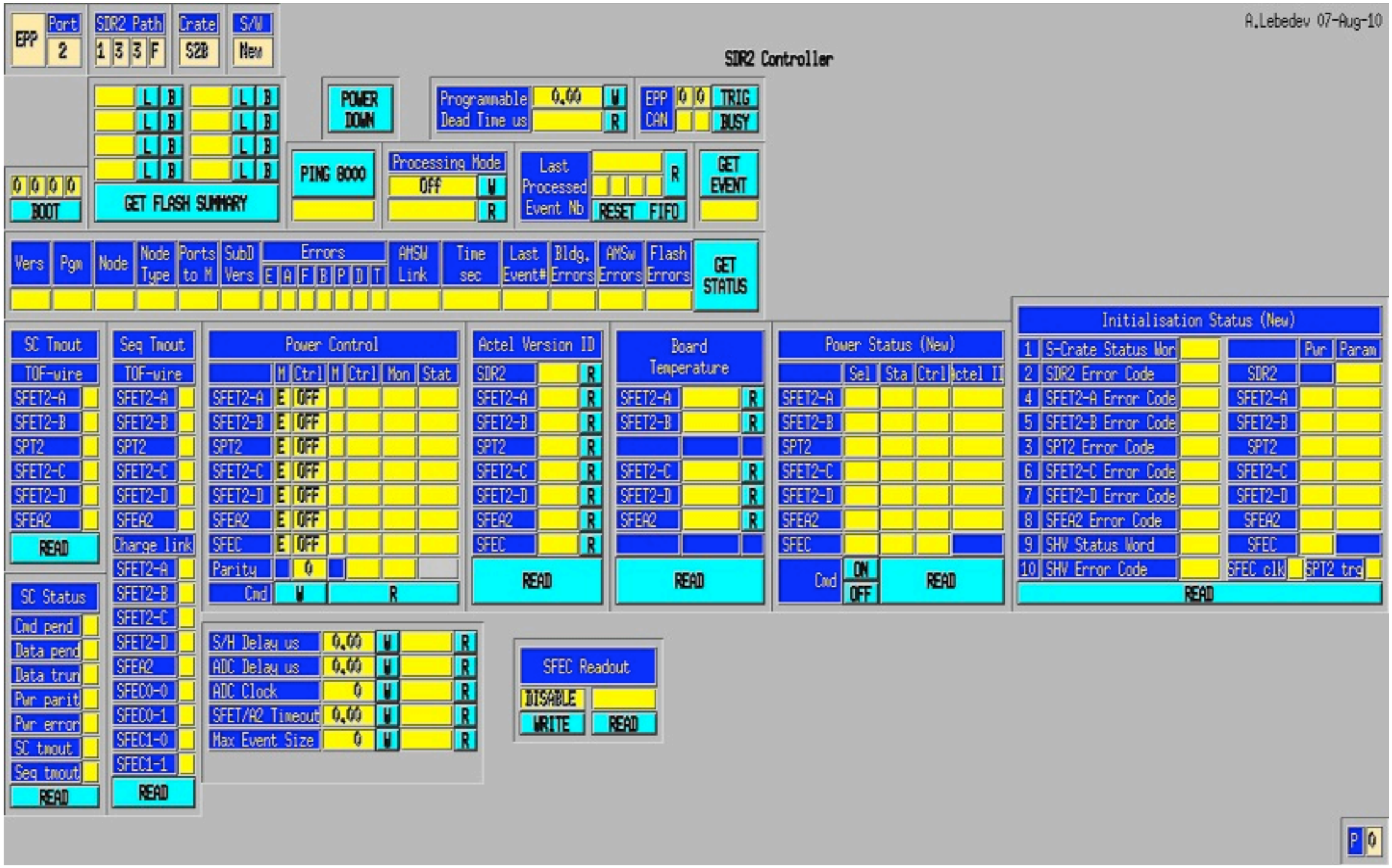




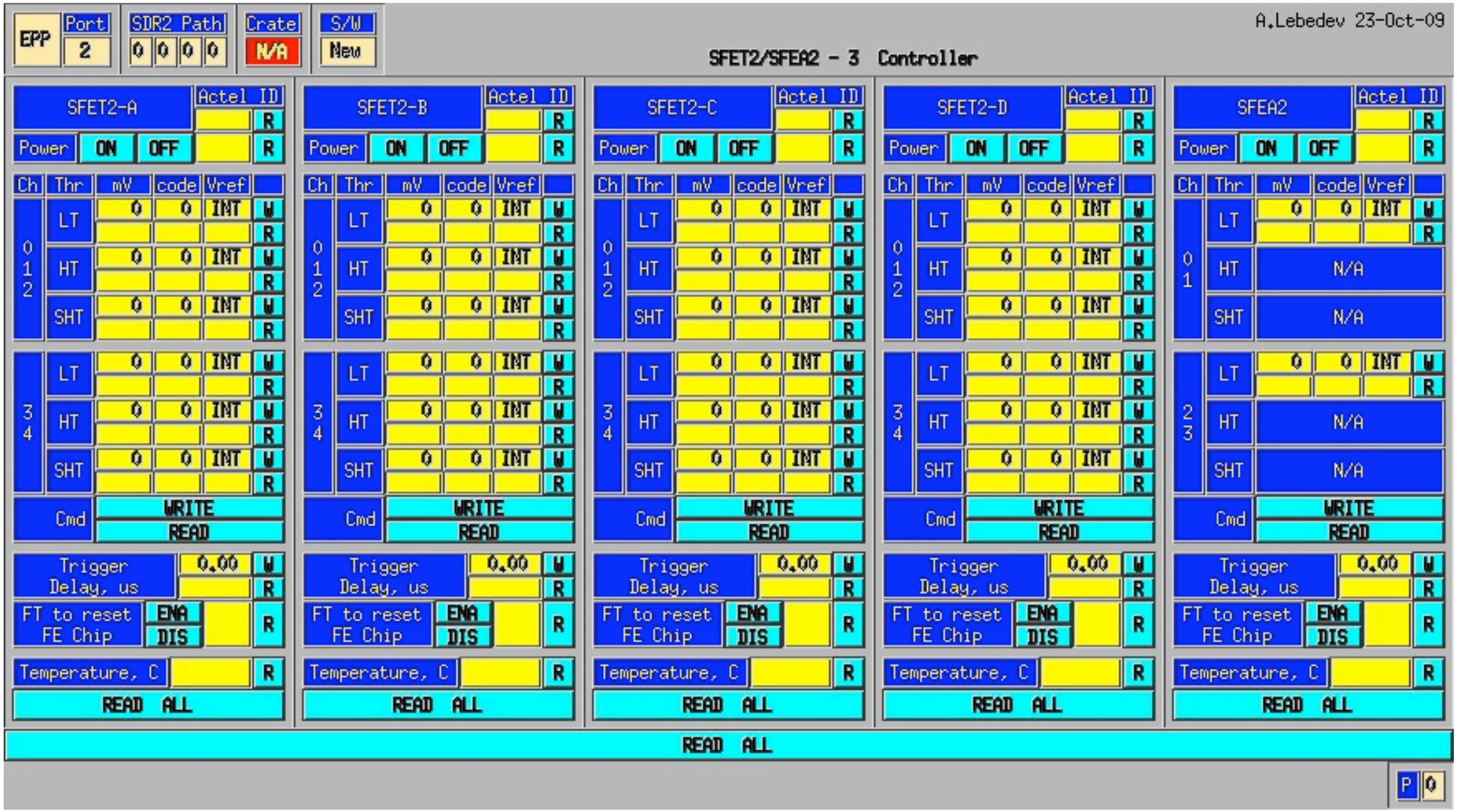




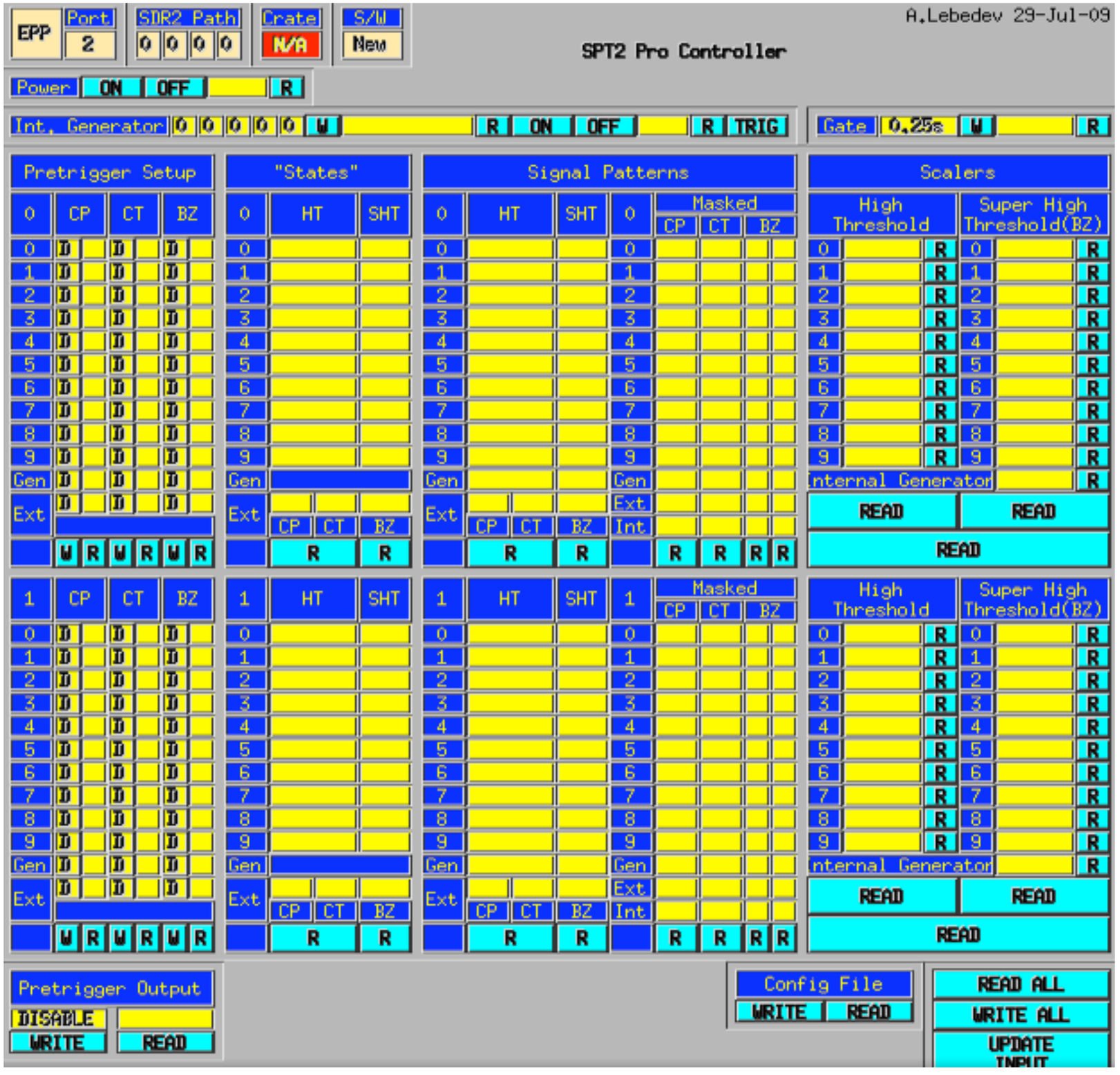
Commanding of the SDR2



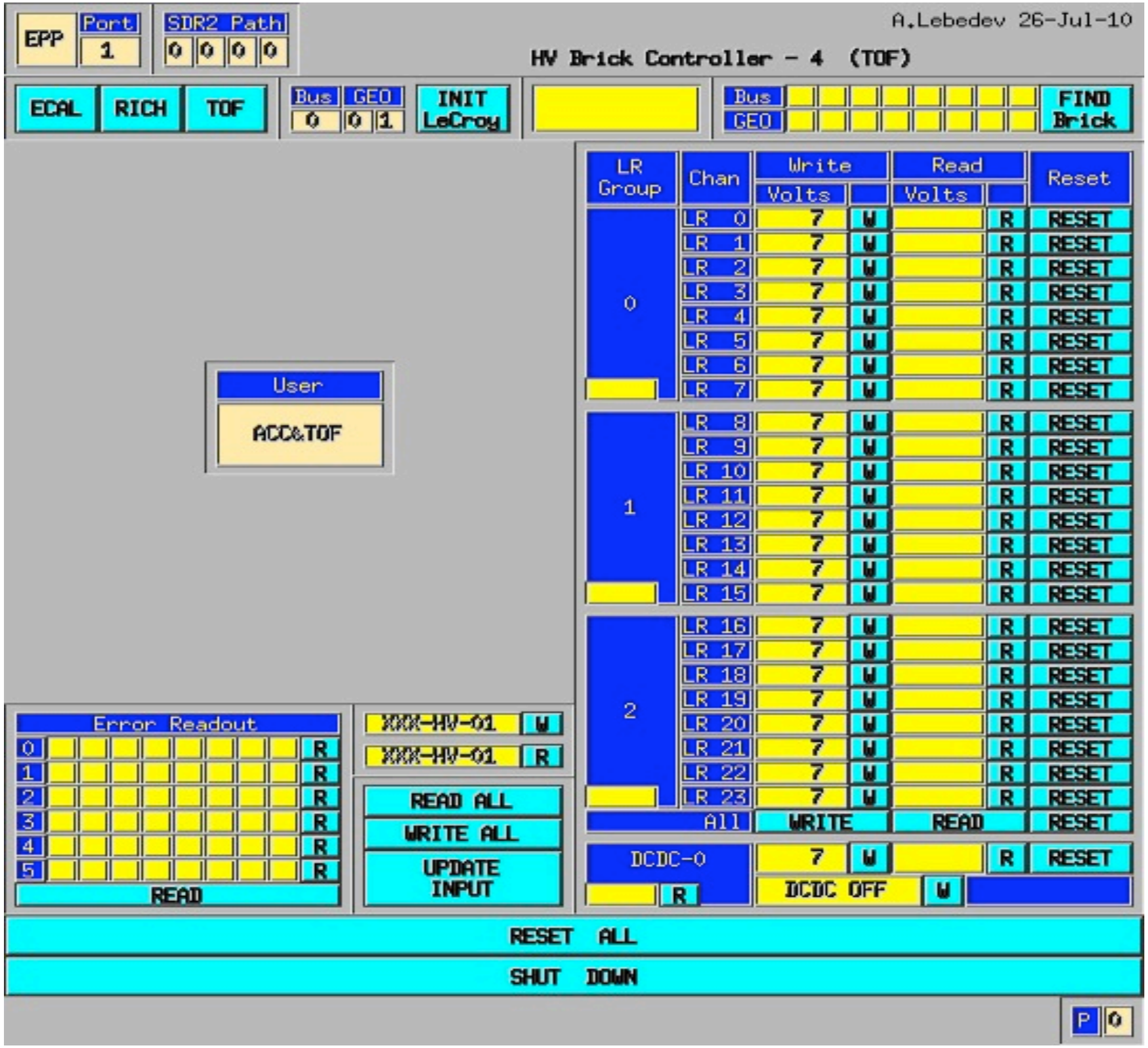
Commanding the SFET2 and SFEA2



Commanding the SPT2



Commanding the HV-brick



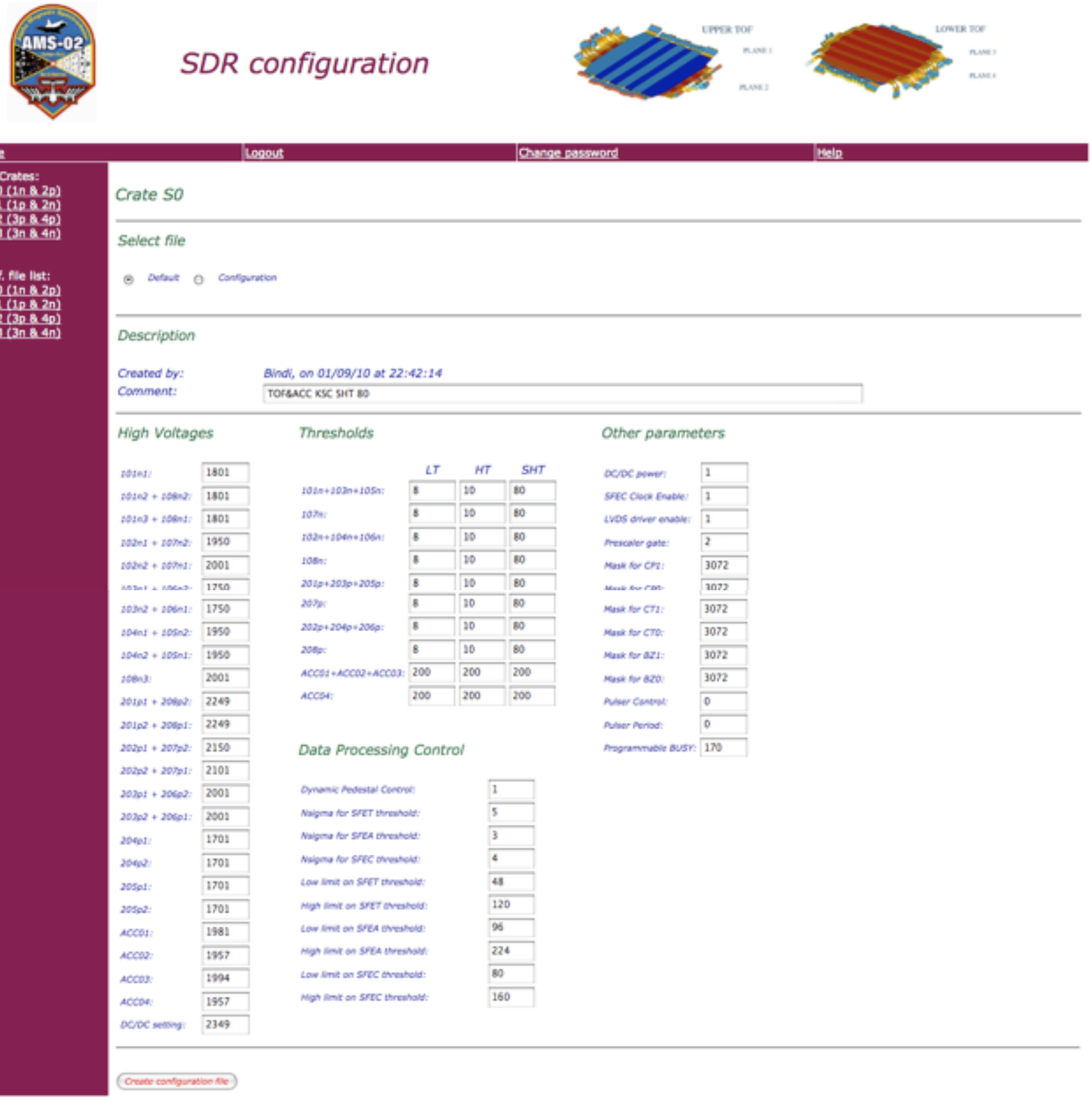
Parameters of the TOF electronics

AMSTOF_configuration http://g5.ambra.unibo.it/AMSTOF_configuration/index.php

This program is used to generate TOF and ACC configuration file in the DSP format containing all the parameters for the TOF electronics.

This software written in php is installed in a web server and accessible through internet from any sites (username and password are required).
An user friendly interface allows to change the key parameters for the tuning of the detector.

All the generated configuration files are stored in the disc so they can be reused in a second moment to reconfigure the detector or to check the used configuration of the detector in a specific date.

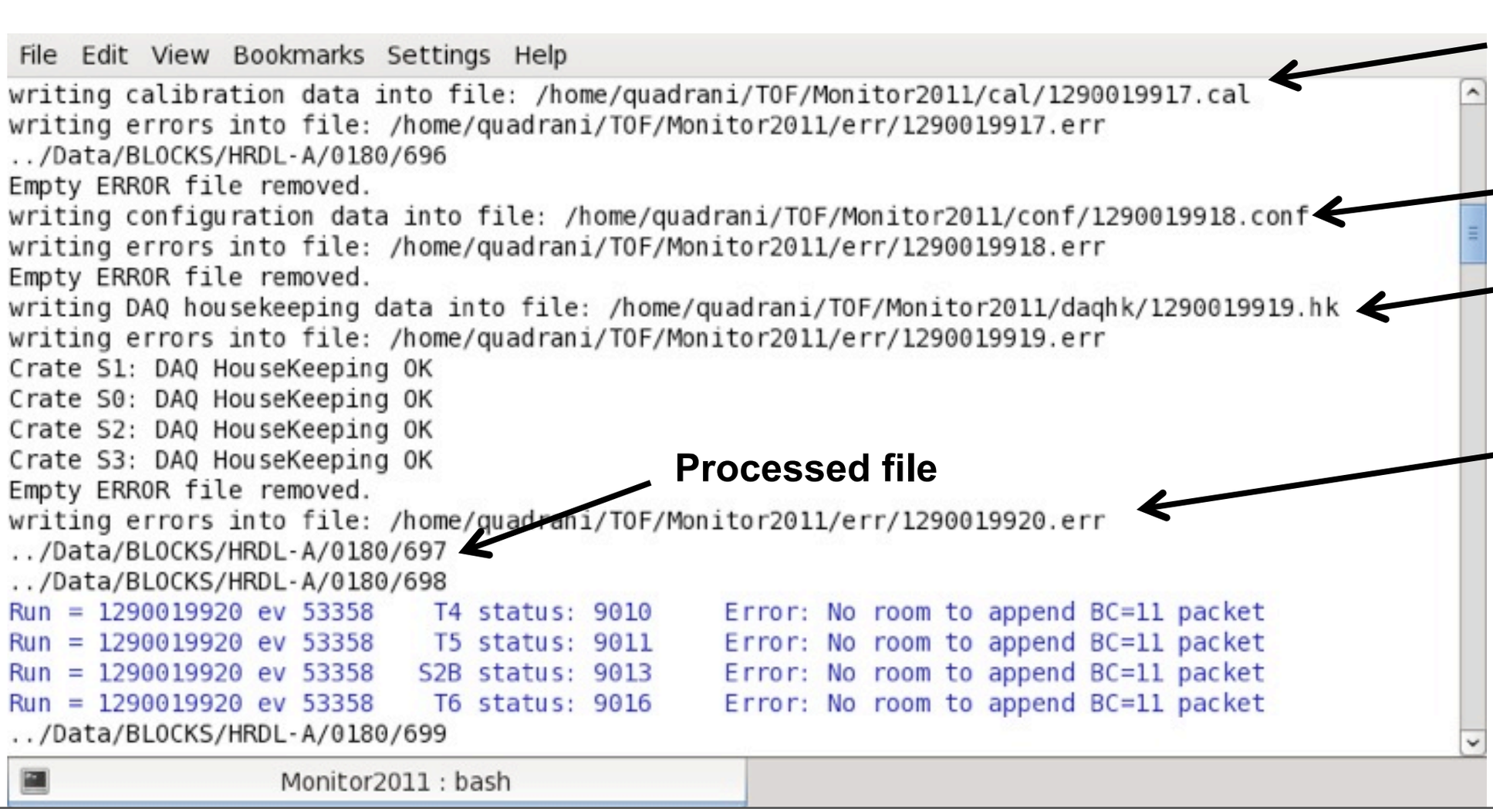


TOF online monitor

DAQ online monitor software allows to monitor and check TOF data quality.
The program reads AMS block data, decodes them, extracts all the data related to TOF and plots the most significant information.

The program processes each data file, reads all AMS blocks and extracts all S-crate information contained inside JMDC blocks. All retrieved information can be dumped in a log file (mainly for debugging purpose). Depending on data type, physics data, configuration parameters, calibration results and DAQ housekeeping words are extracted for each S-crate.

While the monitor is running, the processed data files are showed in the terminal window.
CALIBRATION, CONFIGURATION, DAQ HOUSEKEEPING and ERROR files are created and stored inside the proper directories.



TOF calibration monitor

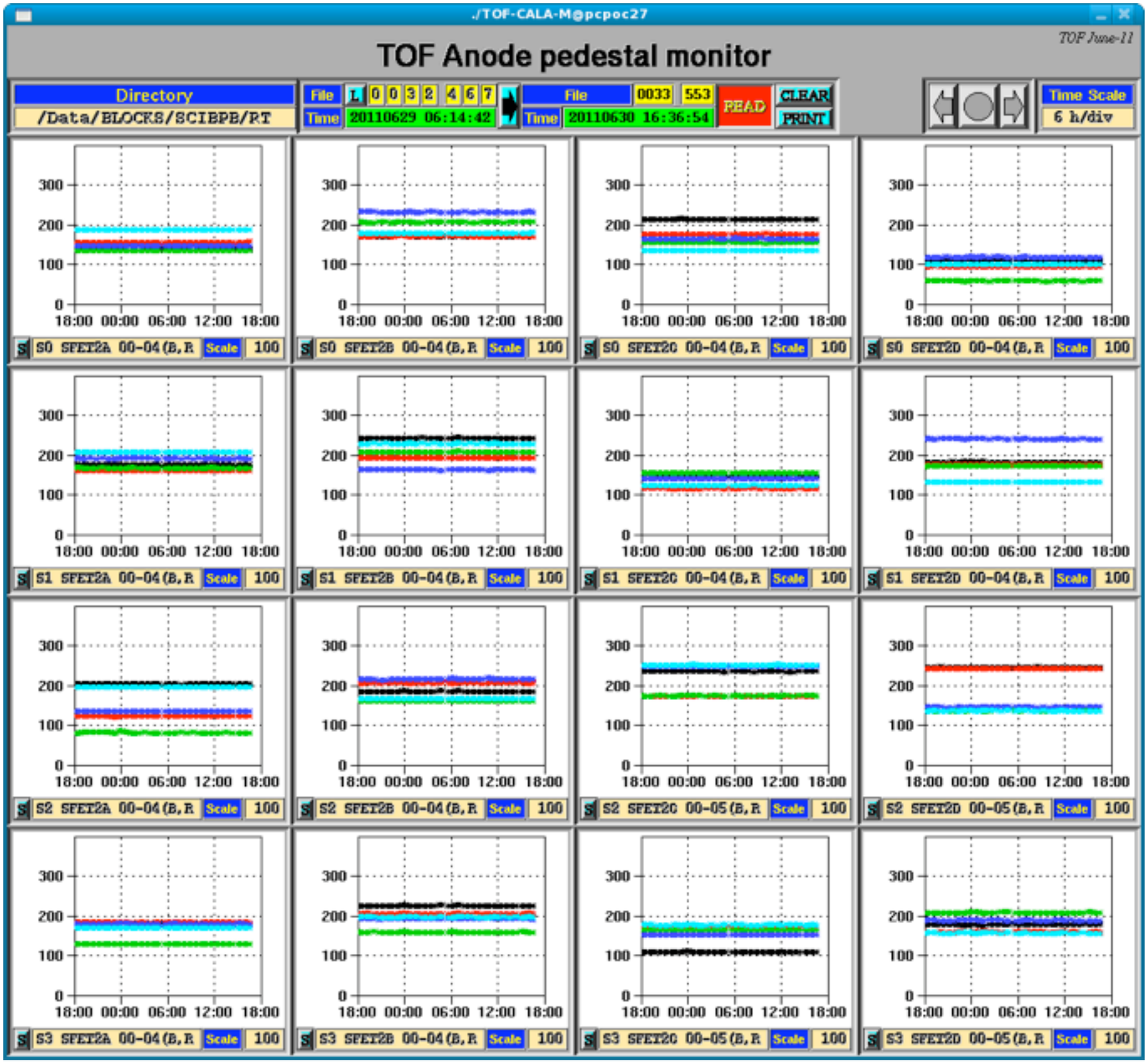
Calibration (data type 6)

S-crate calibration results are available at the beginning of each run (every 30 minutes) and

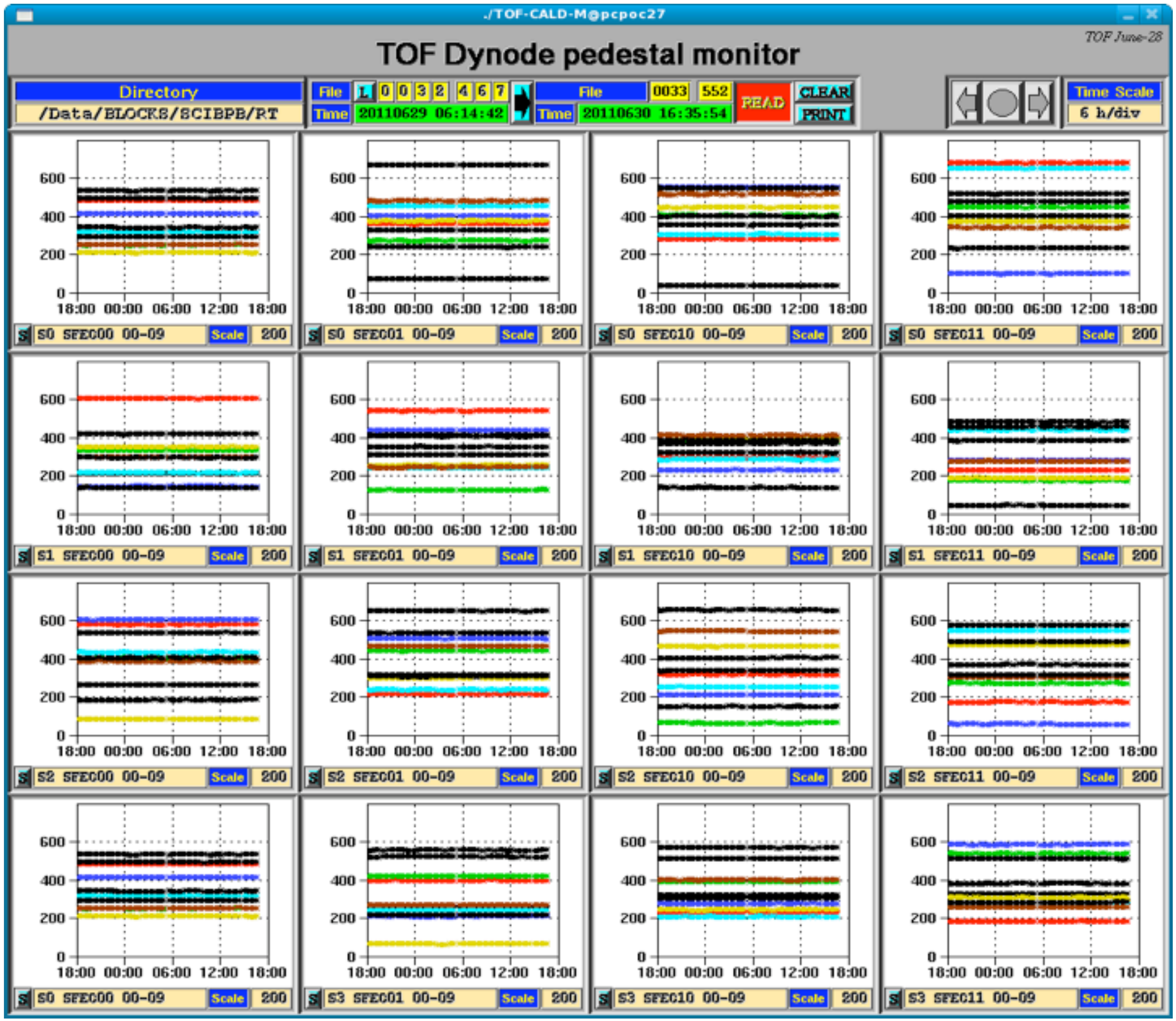
TOF monitor saves them in a text file:
- 1 calibration status word;
- 90 pedestal values;
- 90 pedestal widths
- 90 thresholds values;
- 4 pre-trigger words;
- 10 status words.

```
Crate S0
Claibration Status = 4000
Calibration results are available.

SFET2A
pede:       205.6 100.8 159.4 102.2 136.1 167.9 137.1 125.5 148.2 147.4
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        7.5  6.9  6.2  6.9  6.9  6.0  6.0  6.0  6.0  6.0
SFET2B
pede:       97.8 240.5 227.0 249.8 191.5 132.6 284.0 217.6 256.5 186.9
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        6.9  6.9  8.8  6.9  6.2  6.0  6.0  6.0  6.0  6.0
SFET2C
pede:       198.5 240.6 236.6 151.4 137.0 206.9 181.1 179.2 181.9 212.8
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        7.5  6.2  6.2 15.0  7.5  6.0  6.0  6.0  6.0  6.0
SFET2D
pede:       110.4 198.4 180.6 145.4 247.8 178.6 204.1 199.2 219.9 205.4
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        9.4  6.2  6.2  7.5  6.2  6.0  6.0  6.0  6.0  6.0
SFEA2
pede:       176.8 148.6 247.0 190.4 193.1 182.1 157.6 164.5 248.4 206.1
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        21.0  25.5  28.0  18.8  12.0  12.0  12.0  12.0  12.0  12.0
SFEC00
pede:       530.0 482.0 251.4 408.6 322.0 211.1 251.0 294.5 494.0 338.1
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0
SFEC01
pede:       330.9 366.0 274.0 401.8 453.4 368.8 478.5 661.9 238.0  73.9
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0
SFEC10
pede:       50.8 285.4 407.2 545.2 304.6 443.6 513.6 404.1 552.9 357.4
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0
SFEC11
pede:       405.0 676.6 447.6 100.6 647.1 370.5 342.8 236.0 514.5 477.9
width:      1.5  1.4  1.2  1.4  1.4  0.9  0.9  0.9  0.9  0.9
thr:        10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0  10.0

pretrigger:     1800 1800 0800 0800

status:         0000 1400 0000 1800 0000 0013 0032 7FFF 00B3 0000
```

TOF Pedestal Anode Monitor: TOF-CALA-M



TOF Dynode Pedestal Monitor: TOF-CALD-M



TOF configuration monitor

Configuration (data type 7)
All TOF electronics configuration parameters are retrieved before each run starts (every 30 minutes). The settings and read back values for S-crate and SHV bricks are written in a text file:

- 21 parameters for SDR2 board
- 161 parameters for SFET2A board
- 161 parameters for SFET2B board
- 10 parameters for SPT2 board
- 161 parameters for SFET2C board
- 161 parameters for SFET2D board
- 161 parameters for SFEA2 board
- 26 parameters for SHV brick

TOF configuration monitor

********** S1 crate **********

********** SDR2 parameters **********

Power monitor register

PMON register - power OFF:	0000 0000
PMON register - power ON:	7FFF 7FFF

Internal SDR2 register

SPT2 Command (H):	1400 1400
SPT2 Command (L):	0000 0000
SFET Command (H):	1800 1800
SFET Command (L):	0000 0000
Hold Time:	0013 0013
ADC Delay Time:	0032 0032
Poux Readout Time:	00B3 00B3
SFET Timeout:	01F4 01F4
Power Mask:	0000 0000
SFEC Clock Enable:	0001 0001
Programmable Busy:	2134 2134

Data Processing Control (DM)

Dynamic Pedestal Control:	0001 0001
Nsigma for SFET threshold:	0005 0005
Nsigma for SFEA threshold:	0003 0003
Nsigma for SFEC threshold:	0004 0004
Low limit on SFET threshold:	0030 0030
High limit on SFET threshold:	0078 0078
Low limit on SFEA threshold:	0060 0060
High limit on SFEA threshold:	00E0 00E0
Low limit on SFEC threshold:	0050 0050
High limit on SFEC threshold:	00A0 00A0

SDR2 init error code:	4000 4000

********** SPT2 parameters **********

Prescaler Subgroup

Prescaler gate:	0002 0002

Mask Subgroup

Mask for CP1:	0C00 0C00
Mask for CP0:	0C00 0C00
Mask for CT1:	0C00 0C00
Mask for CT0:	0C00 0C00
Mask for BZ1:	0C00 0C00
Mask for BZ0:	0C00 0C00

LVDS Driver Subgroup

LVDS driver Enable:	0001 0001

Pulser Subgroup

Pulser Control:	0000 0000
Pulser Period:	0000 0000
SPT2 Version:	0215 0215
SPT2 init error code:	0000 0000

********** SFET2A parameters **********

Threshold Subgroup

LT threshold, ch0-2:	8308 8308
LT threshold, ch3-4:	8708 8708
HT threshold, ch0-2:	830A 830A
HT threshold, ch3-4:	8713 8713
SHT threshold, ch0-2:	8350 8350
SHT threshold, ch3-4:	8778 8778

TDC Setup Subgroup

TEST SELECT:	000E 000E
ENABLE ERROR MARK:	0001 0001
ENABLE ERROR BYPASS:	0000 0000
ENABLE ERROR:	07FF 07FF
READOUT SC SPEED:	0002 0002
SERIAL DELAY:	0000 0000
STROBE SELECT:	0003 0003

....

SHV1

********** SHV parameters **********

DC/DC Subgroup

DC/DC power	0001 0001
DC/DC setting	03C1 03C1

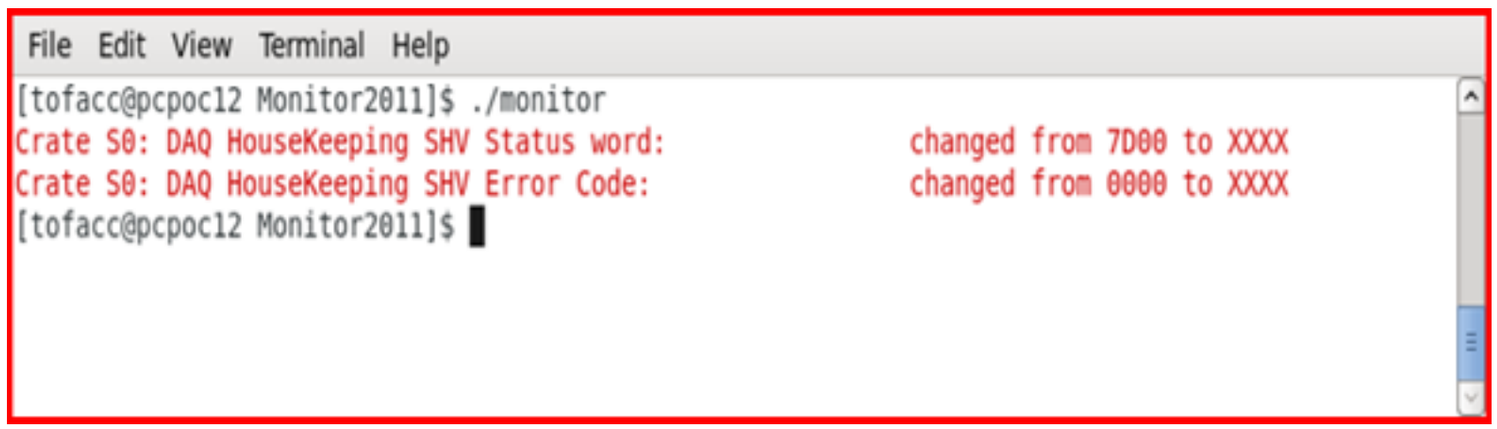
LR Subgroup

LR0 setting	02E0 02E0
LR1 setting	02E0 02E0
LR2 setting	02E0 02E0
LR3 setting	035B 035B
LR4 setting	035B 035B
LR5 setting	02E0 02E0
LR6 setting	02E0 02E0
LR7 setting	0398 0398
LR8 setting	0398 0398
LR9 setting	031D 031D
LR10 setting	036F 036F

....

TOF house keeping

Housekeeping (data type 8)
Housekeeping information are checked constantly during data acquisition. HK words contain in brief the status of the detector and they can reveal if some parameter change in the TOF configuration.
All housekeeping information are saved in a text file.
In case of some housekeeping words change during DAQ, discrepancies are reported with red lines in the terminal window and errors are added to error file.



Program Version ID
Subdetector Version ID
Node status word
Last Event Number
Average Event Processing time
Calibration Type
Calibration Status
Power Monitor word
S-Crate Status word
SDR2 Error Code
SPT2 Error Code
SFET2-A Error Code
SFET2-B Error Code
SFET2-C Error Code
SFET2-D Error Code
SFEA2 Error Code
SHV Status word
SHV Error Code
Reply Status
Frame Check Sequence

TOF house keeping

Crate S0 - Housekeeping data

Program Version ID:	AB06
Subdetector Version ID:	AB08
Node Status word:	0000
Last Event Number:	0000
Average Event Processing time:	0004
Calibration Type:	8000
Calibration Status:	4000
Power Monitor word:	7FFF
S-Crate Status word:	C07F
SDR2 Error Code:	4000
SPT2 Error Code:	0000
SFET2A Error Code:	0000
SFET2B Error Code:	0000
SFET2C Error Code:	0000
SFET2D Error Code:	0000
SFEA2 Error Code:	0000
SHV Status word:	7D00
SHV Error Code:	0000
Reply Status:	00A0

TOF house keeping monitor

In standard situation:

DAQ Housekeeping Thu Jun 30 16:35:46 2011

	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

Waiting for a new file...

In case of errors:

tofacc@pcpoc27:/nfs_mnt/pocchome/tofacc/TOF/Monitor2010_hk

DAQ Housekeeping Mon Jun 27 09:45:58 2011

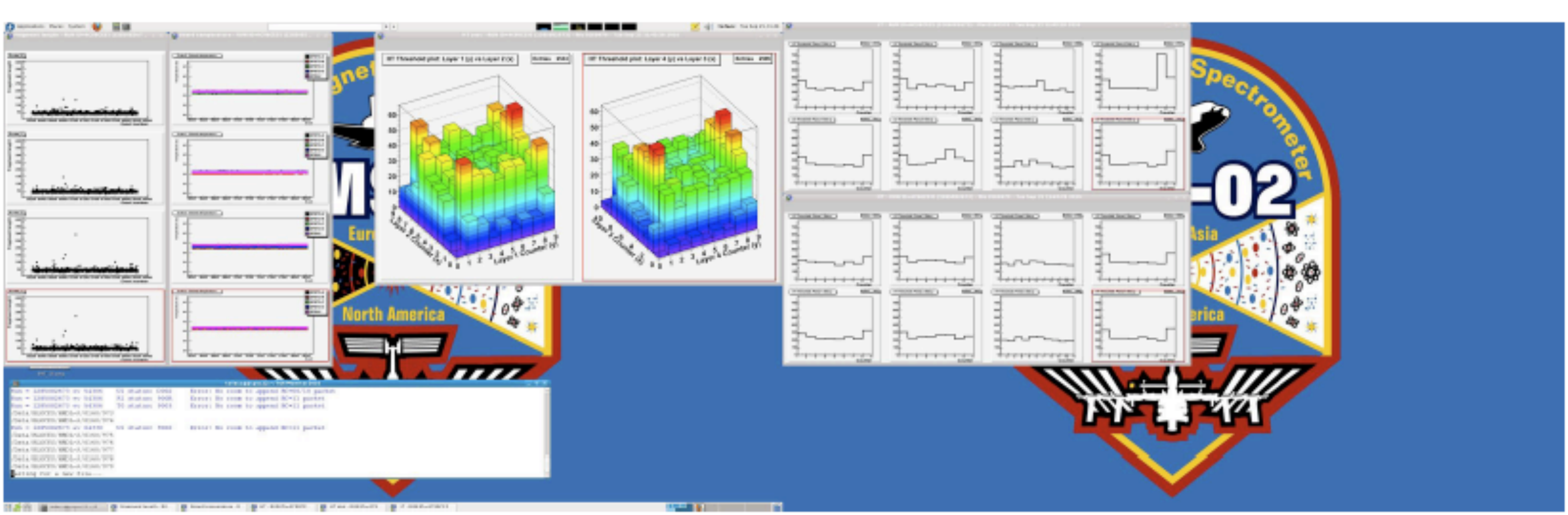
	S0	S1	S2	S3
Node Status word	0000	0000	0000	0000
Calibration Status	4000	4000	4000	4000
Power Monitor word	7FFF	7FFF	7FFF	7FFF
S-Crate Status word	FB7F Def: C07F	FB7F Def: C07F	FB7F Def: C07F	FB7F Def: C07F
SDR2 Error Code	0000 Def: 4000	0000 Def: 4000	0000 Def: 4000	0000 Def: 4000
SPT2 Error Code	0000	0000	0000	0000
SFET2A Error Code	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000
SFET2B Error Code	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000
SFET2C Error Code	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000
SFET2D Error Code	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000
SFEA2 Error Code	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000	0001 Def: 0000
SHV Status word	7D00	7D00	7D00	7D00
SHV Error Code	0000	0000	0000	0000

^C

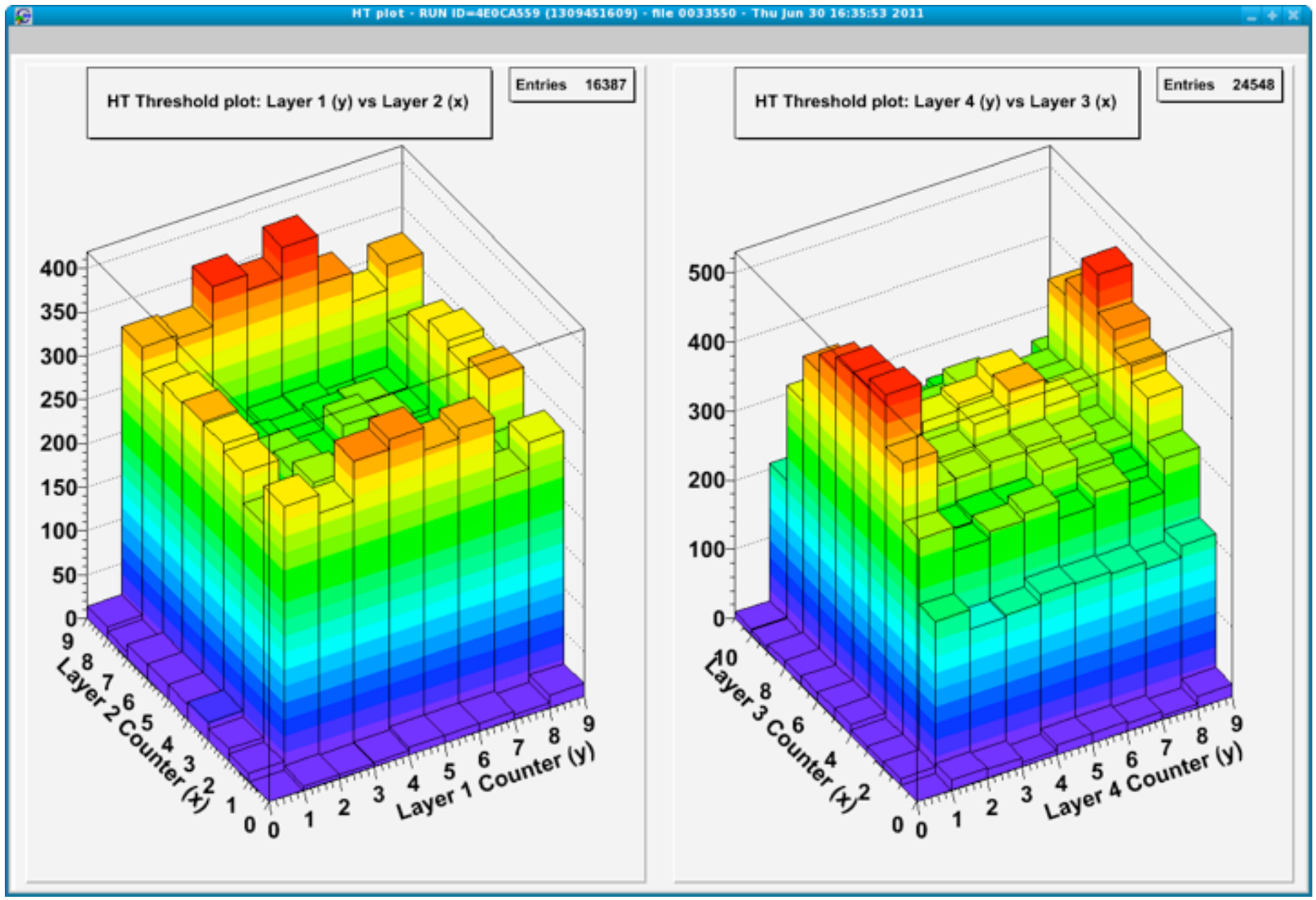
TOF online monitor: physics events

Physics events (data type 5)
Physics events for TOF are represented using some significant plots that summarize the detector behavior. The plots visualized by TOF online monitor are:
- S-crate event size;
- SFET2/SFEA2 board temperatures;
- low thresholds/TDC number of hits;
- high thresholds/trigger rates;
- trigger occupancy histogram.

In each plot, run number, data file and the date are reported.



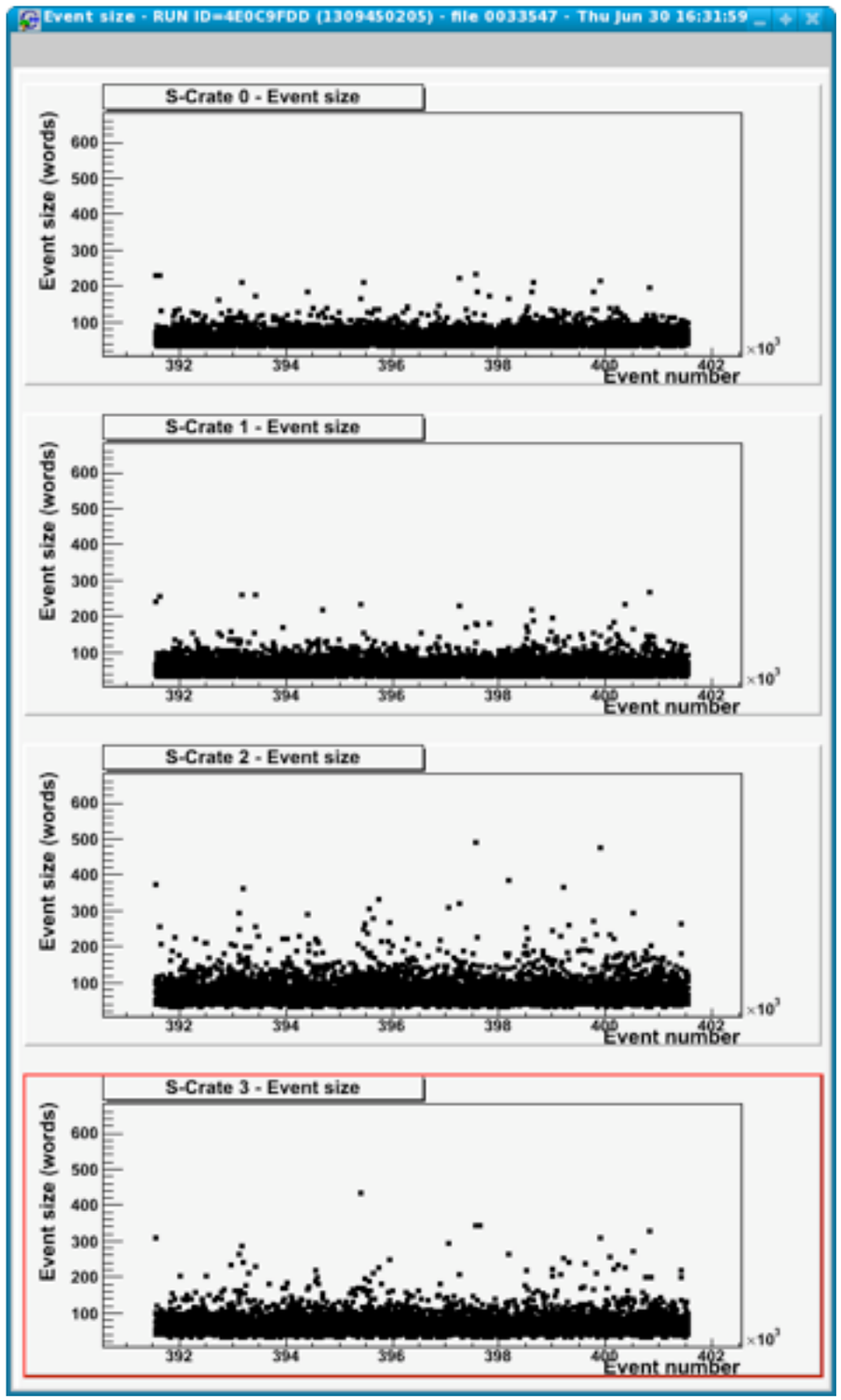
TOF online monitor: HT thresholds



These two histograms gave you a global view that the TOF is triggering, in particular they show the number of times each TOF counter gave a trigger.
In the left the histogram for the Upper TOF counters in the first and the second layer in the y and x axis respectively is shown while in the right is shown the LTOF one.

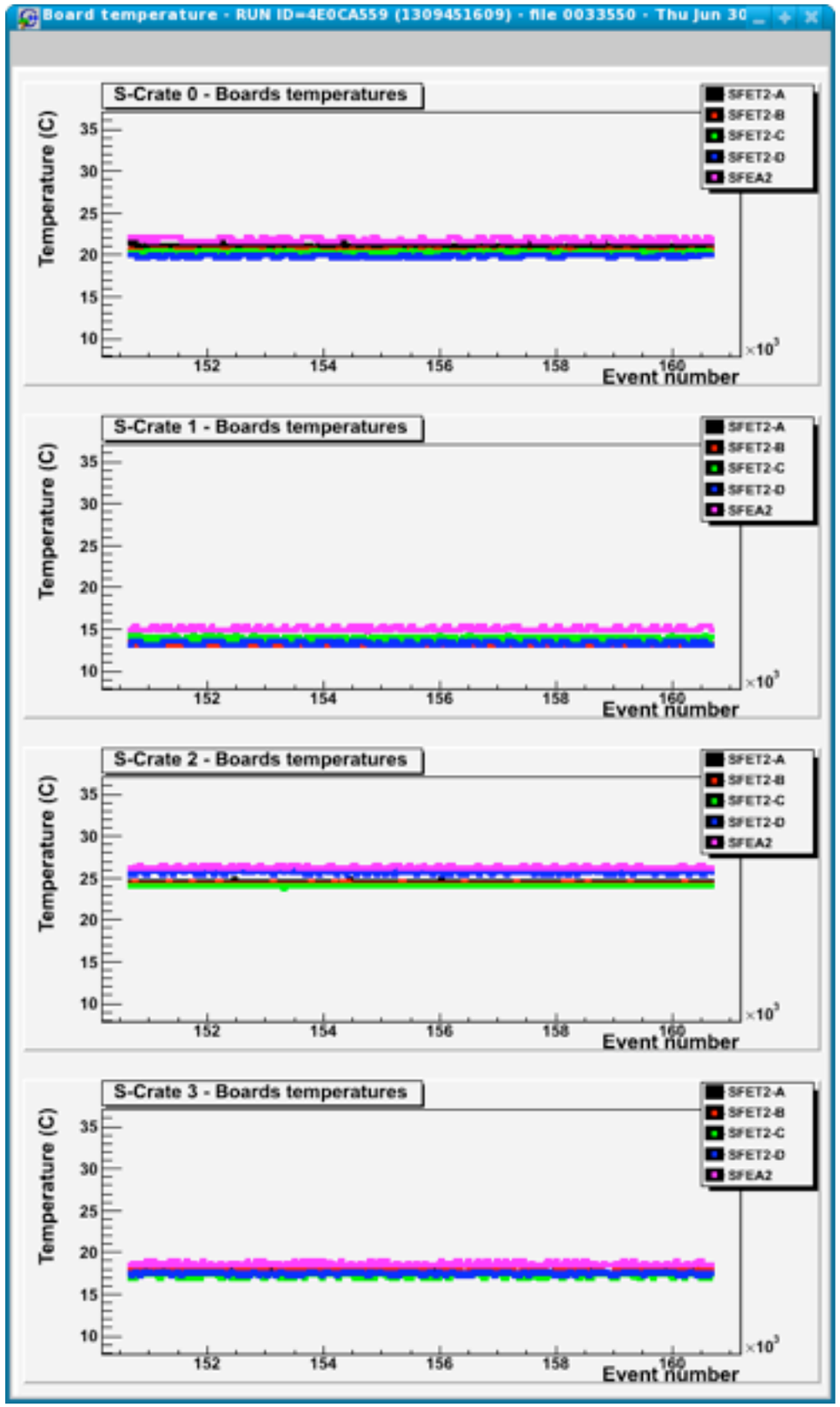
TOF online monitor: Event size

Event size
The S-crate event size is the first word of the SDR event fragment. It is a sum of charge, pre-trigger, status and time words.



The Event size (in number of words) versus the event number for each of the four TOF crates (Crate S0/S1/S2/S3) is shown.
The crate are connected to TOF layers and sides with this scheme:
S0: 1n 2p
S1: 1p 2n
S2: 3p 4p
S3: 3n 4n

TOF online monitor: Event size

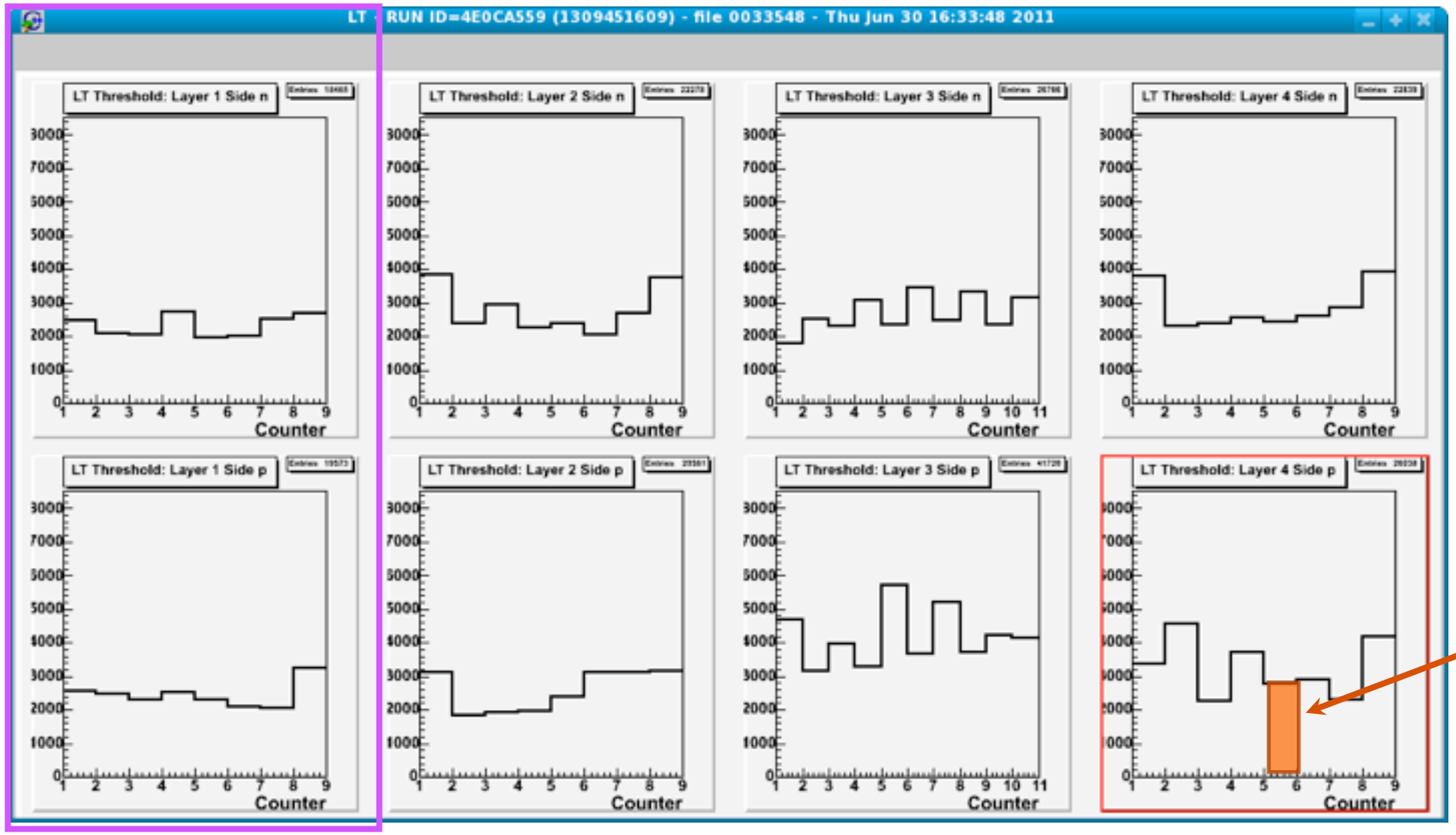


The electronic board temperatures versus the number of event for each of the four TOF crates is monitored.

TOF low thresholds

TOP: negative counters side (n)

Bottom: positive counters side (p)



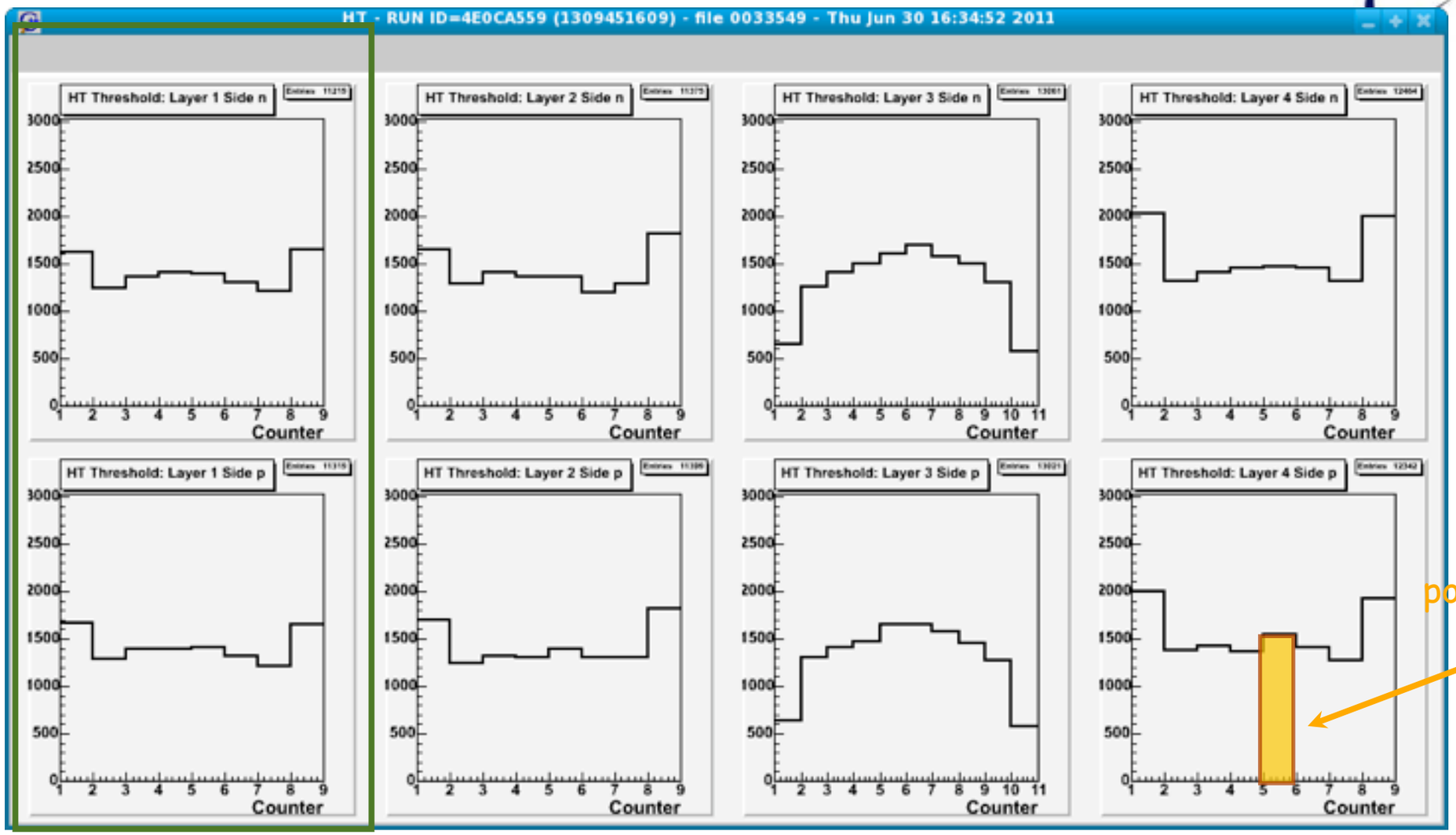
Layer 4
Counter 5
positive side (p)

These histograms show the number of times that the signal cross the low thresholds used for the time measurements (number of hits in the TDC).
From left to right each couple of histograms (top and bottom) represent respectively the first, the second, the third and the fourth TOF layer.
In each histogram the number of hits measured in each TOF counter are shown.

TOF high thresholds

TOP: negative counters side (n)

Bottom: positive counters side (p)

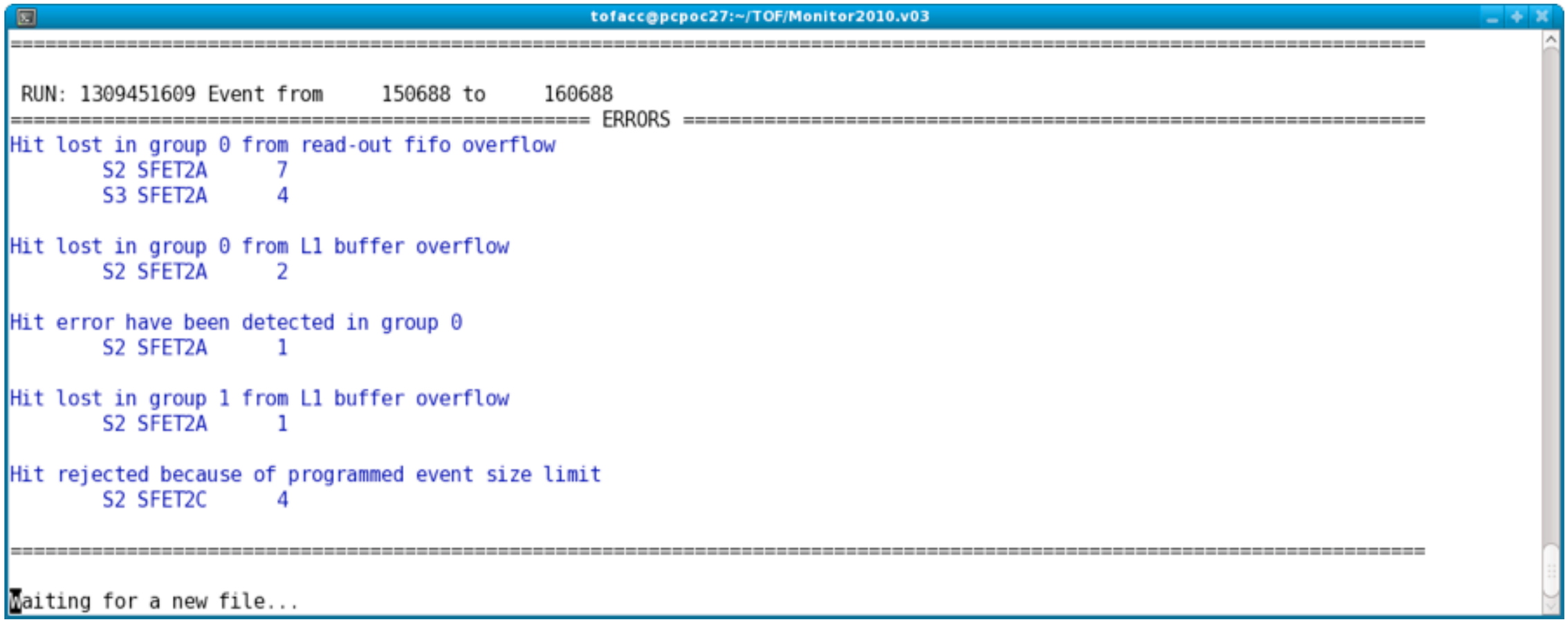


Layer 4
Counter 5
positive side (p)

These histograms show the number of times that the signal cross the high thresholds used to generate the AMS trigger.
In each histogram the number of triggers from each TOF counter are shown.
The first and last counter of each plot give always more counts because of geometrical reasons (their trapezoidal, with a larger surface), except for layer 3, which has 10 counters, because counters 1 and 10 are removed from the physical trigger. This was done to have an acceptance conform to the tracker.

TOF blue errors

While monitor is running some errors could occur, they are highlighted in colored lines.
The errors related to the DAQ are written in blue as shown below:



Errors found during the data acquisition can be:
- DAQ errors (error reading or building data blocks...);
- Node status errors;
- Configuration parameters discrepancies;
- TDC errors;
- Housekeeping discrepancies.

TOF red errors

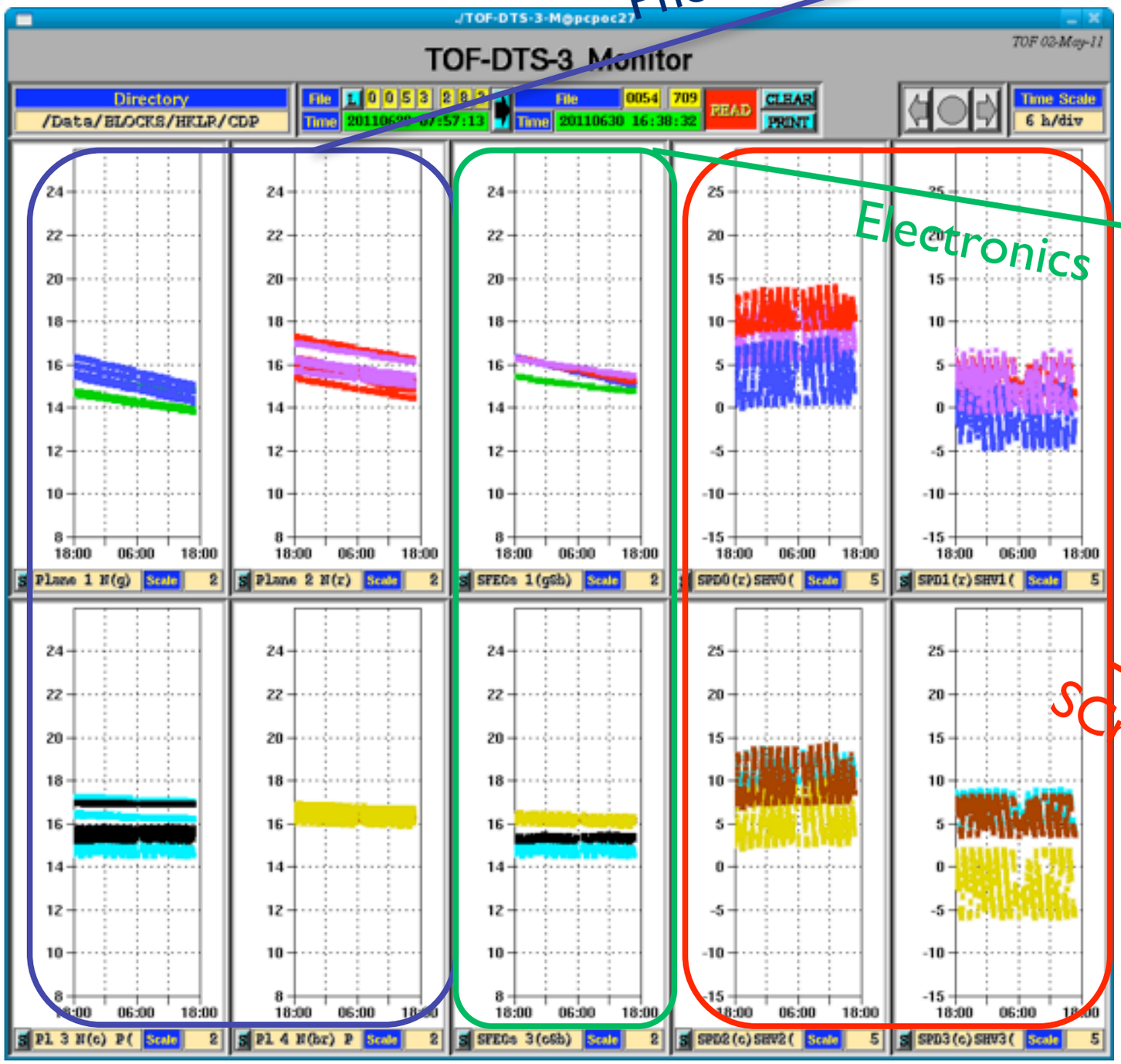
The errors strictly related to the TOF are written in red, and they are spotted has shown below.

Monitor2010 : monitor

File Edit View Scrollback Bookmarks Settings Help

```
Run = 1307305115 ev 274003 S2 SFET2C    Hit rejected because of programmed event size limit
Run = 1307305115 ev 274003 S2 SFET2A    Error flag = 0
writing DAQ housekeeping data into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/daqhk/1307305633.
hk
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1307305633.err
Crate S0: DAQ HouseKeeping S-Crate Status word:            changed from C07F to FB7F
Crate S0: DAQ HouseKeeping SFET2A Error Code:              changed from 0000 to 0001
Crate S0: DAQ HouseKeeping SFET2B Error Code:              changed from 0000 to 0001
Crate S0: DAQ HouseKeeping SFET2C Error Code:              changed from 0000 to 0001
Crate S0: DAQ HouseKeeping SFET2D Error Code:              changed from 0000 to 0001
Crate S0: DAQ HouseKeeping SFEA2 Error Code:               changed from 0000 to 0001
Crate S1: DAQ HouseKeeping S-Crate Status word:            changed from C07F to FB7F
Crate S1: DAQ HouseKeeping SFET2A Error Code:              changed from 0000 to 0001
Crate S1: DAQ HouseKeeping SFET2B Error Code:              changed from 0000 to 0001
Crate S1: DAQ HouseKeeping SFET2C Error Code:              changed from 0000 to 0001
Crate S1: DAQ HouseKeeping SFET2D Error Code:              changed from 0000 to 0001
Crate S1: DAQ HouseKeeping SFEA2 Error Code:               changed from 0000 to 0001
Crate S2: DAQ HouseKeeping S-Crate Status word:            changed from C07F to FB7F
Crate S2: DAQ HouseKeeping SFET2A Error Code:              changed from 0000 to 0001
Crate S2: DAQ HouseKeeping SFET2B Error Code:              changed from 0000 to 0001
Crate S2: DAQ HouseKeeping SFET2C Error Code:              changed from 0000 to 0001
Crate S2: DAQ HouseKeeping SFET2D Error Code:              changed from 0000 to 0001
Crate S2: DAQ HouseKeeping SFEA2 Error Code:               changed from 0000 to 0001
Crate S2: DAQ HouseKeeping SHV Error Code:                 changed from 0000 to 0001
Crate S3: DAQ HouseKeeping S-Crate Status word:            changed from C07F to FB7F
Crate S3: DAQ HouseKeeping SFET2A Error Code:              changed from 0000 to 0001
Crate S3: DAQ HouseKeeping SFET2B Error Code:              changed from 0000 to 0001
Crate S3: DAQ HouseKeeping SFET2C Error Code:              changed from 0000 to 0001
Crate S3: DAQ HouseKeeping SFET2D Error Code:              changed from 0000 to 0001
Crate S3: DAQ HouseKeeping SFEA2 Error Code:               changed from 0000 to 0001
Empty ERROR file removed.
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1307305984.err
Empty ERROR file removed.
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1307305985.err
Run = 1307305985 ev 274185 S3 SFET2A    Hit lost in group 0 from read-out fifo overflow
writing errors into file: /nfs_mnt/pocchome/tofacc/TOF/Monitor2010/err/1307305987.err
Empty ERROR file removed.
```

TOF Slow control Monitor:TOF-DTS



Phototubes

Electronics

SCrate

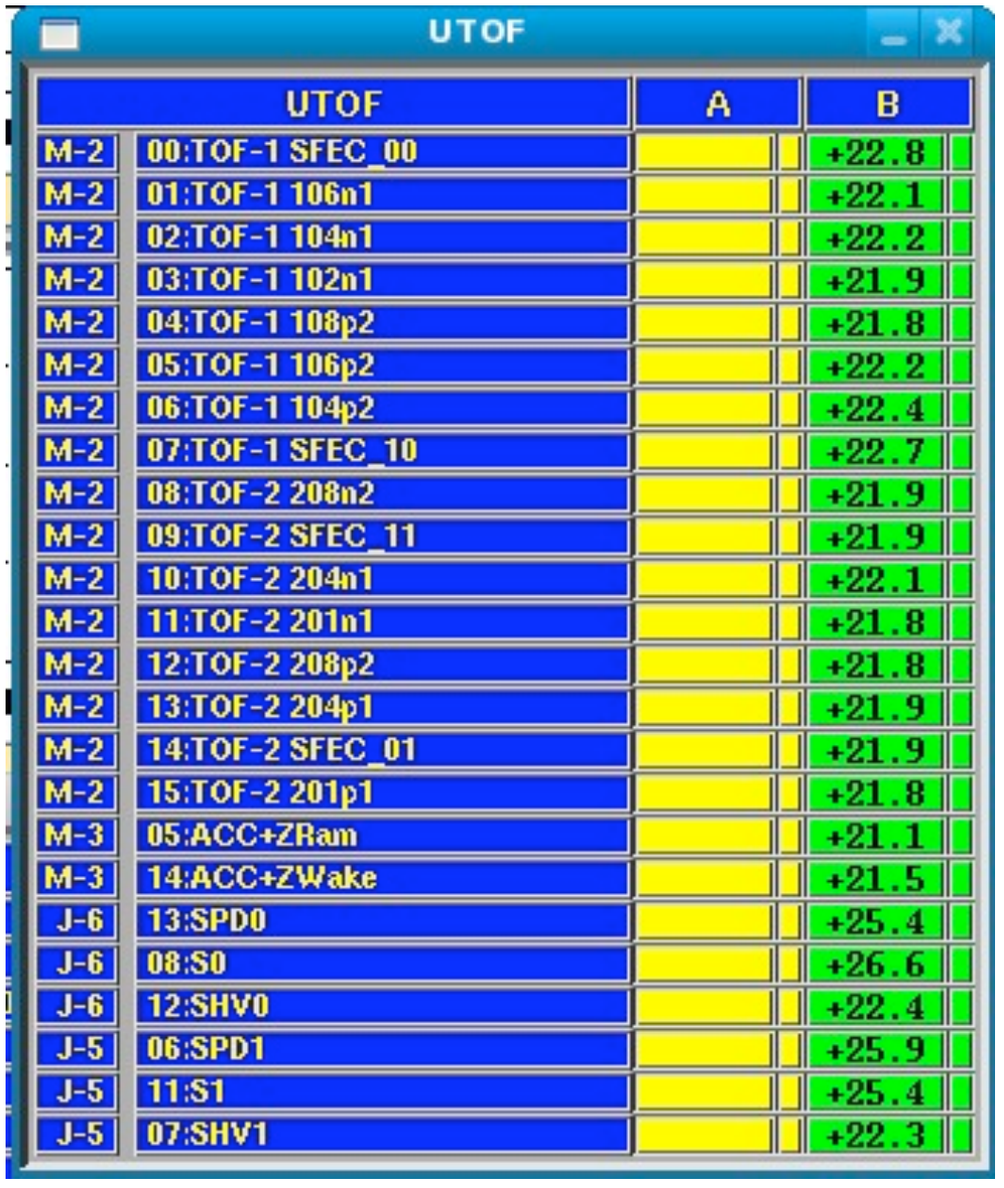
MIN Operative °C	MAX Operative °C	Normal °C
-30	+35	15÷16

	MIN Operative °C	MAX Operative °C	Normal °C
SFEC	-40	+80	15÷16

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

TOF Slow control Monitor: DTS

TOF temperatures are monitored also using GTSN-3-M program.
This program shows current values of temperatures and alarm status.



TOF monitor for the slow rate data

SPT2 scaler [Hz] Thu Jun 30 16:41:27 2011

Lay	1N HT	1N SHT	Lay	1P HT	1P SHT	Lay	2N HT	2N SHT	Lay	2P HT	2P SHT	Lay	3N HT	3N SHT	Lay	3P HT	3P SHT	Lay	4N HT	4N SHT	Lay	4P HT	4P SHT
1n	3772	903	1p	3769	977	1n	3724	1022	1p	3827	1114	1n	3184	1012	1p	3066	933	1n	4754	1214	1p	4686	1229
2n	2388	565	2p	2516	762	2n	2624	1220	2p	2447	697	2n	2469	632	2p	2697	1160	2n	2756	727	2p	2930	1183
3n	2612	805	3p	2754	1205	3n	2837	1268	3p	2452	598	3n	2720	822	3p	2705	900	3n	2799	770	3p	2907	1042
4n	2682	1146	4p	2486	755	4n	2641	985	4p	2522	598	4n	2906	789	4p	2857	822	4n	3081	1242	4p	2831	837
5n	2466	686	5p	2510	966	5n	2635	884	5p	2773	1111	5n	2860	747	5p	3206	1411	5n	2770	760	5p	3206	1707
6n	2477	659	6p	2483	647	6n	2338	594	6p	2829	1103	6n	3085	1064	6p	2899	773	6n	2929	980	6p	2768	733
7n	2406	630	7p	2375	687	7n	2410	708	7p	2548	909	7n	2780	665	7p	2812	828	7n	2797	1029	7p	2678	607
8n	3716	889	8p	3683	833	8n	3992	1283	8p	4074	1404	8n	2840	790	8p	2730	768	8n	4695	1198	8p	4613	1235
												9n	2659	934	9p	2422	693						
												10n	3163	801	10p	3137	999						

Dallas Sensor Temperatures [°C] Thu Jun 30 16:40:53 2011

TOF-1 SFEC_00	14.8	TOF-2 208n2	14.9	TOF-3 SFEC_30	14.6	TOF-4 SFEC_31	16.2
TOF-1 106n1	13.9	TOF-2 SFEC_11	15.2	TOF-3 302n1	15.5	TOF-4 402n2	16.6
TOF-1 104n1	13.9	TOF-2 204n1	16.2	TOF-3 305n2	17.0	TOF-4 404n2	16.2
TOF-1 102n1	13.8	TOF-2 201n1	14.4	TOF-3 309n2	16.2	TOF-4 406n2	16.4
TOF-1 108p2	14.3	TOF-2 208p2	15.2	TOF-3 301p2	15.5	TOF-4 401p1	16.3
TOF-1 106p2	14.4	TOF-2 204p1	16.1	TOF-3 305p2	16.9	TOF-4 404p1	16.5
TOF-1 104p2	14.8	TOF-2 SFEC_01	15.5	TOF-3 309p2	15.8	TOF-4 406p1	16.7
TOF-1 SFEC_10	15.1	TOF-2 201p1	15.1	TOF-3 SFEC_20	15.3	TOF-4 SFEC_21	16.2
SHV0	1.7	SHV1	-1.4	SHV2	3.9	SHV3	-5.6
SPD0 (TSPD1)	10.3	SPD1 (TSPD3)	1.6	SPD2 (TSPD4)	10.5	SPD3 (TSPD6)	3.9

DAQ Housekeeping Thu Jun 30 16:35:46 2011

	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

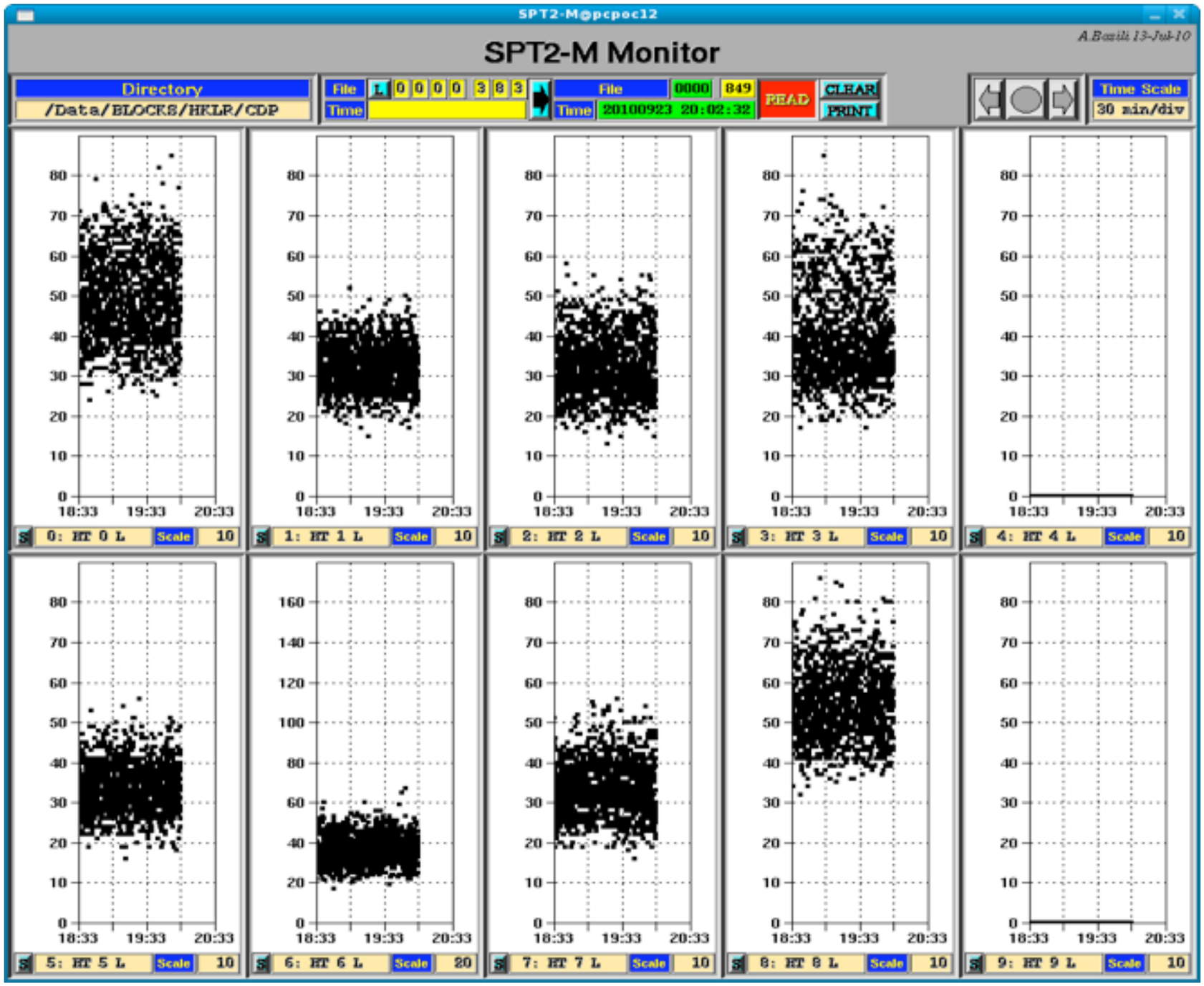
Waiting for a new file...

TOF Slow control Monitor: SPT-M

Pre-trigger signals, generated by Time Of Flight in the SPT2 board, are monitored by SPT2-M program.

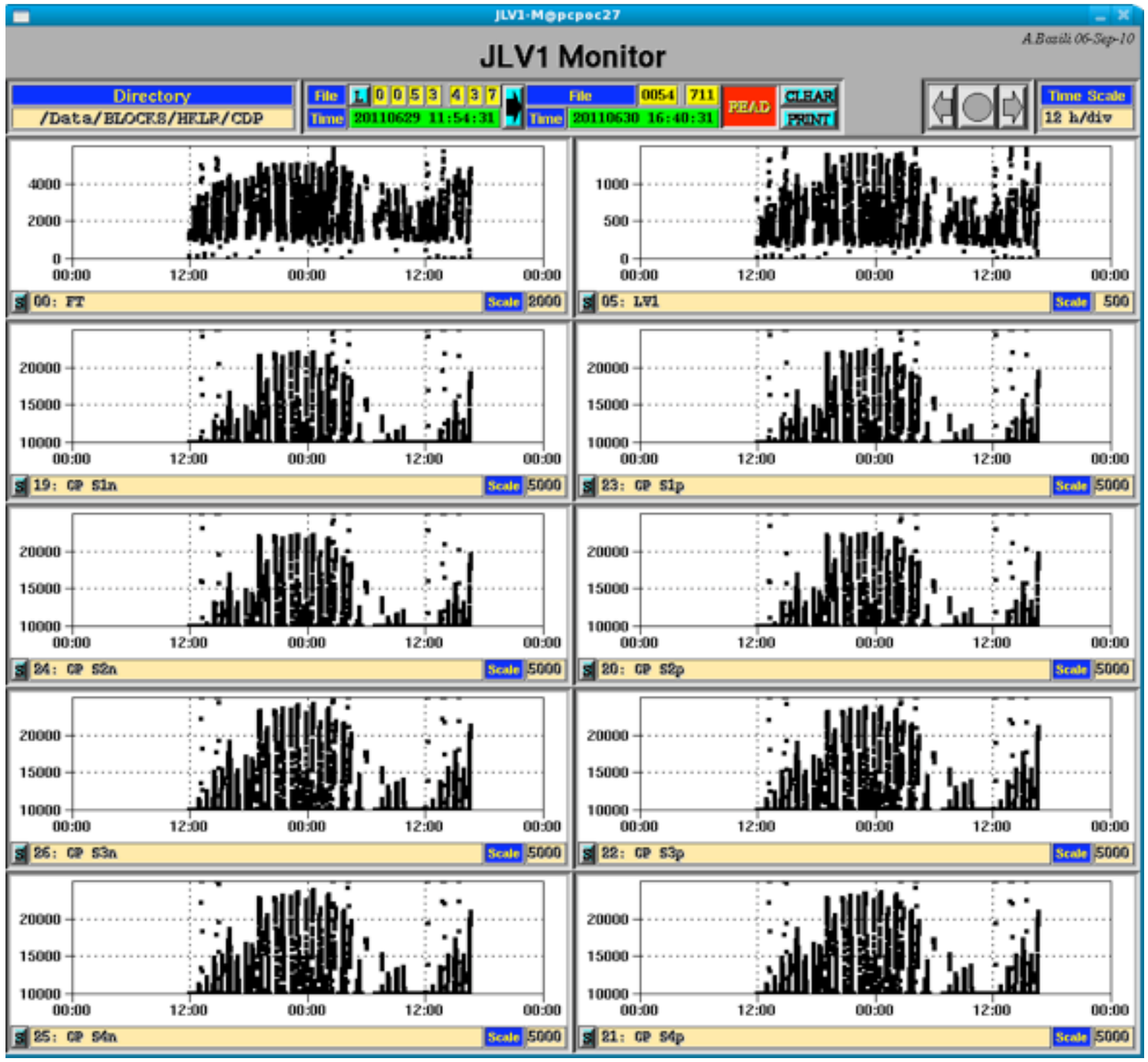
This program is useful when DAQ is not running to check that TOF pre-triggers are generated.

The OR of all pre-trigger signals (HT), coming from one side of each TOF plane, produce a CP signal in input to JLV1 board.

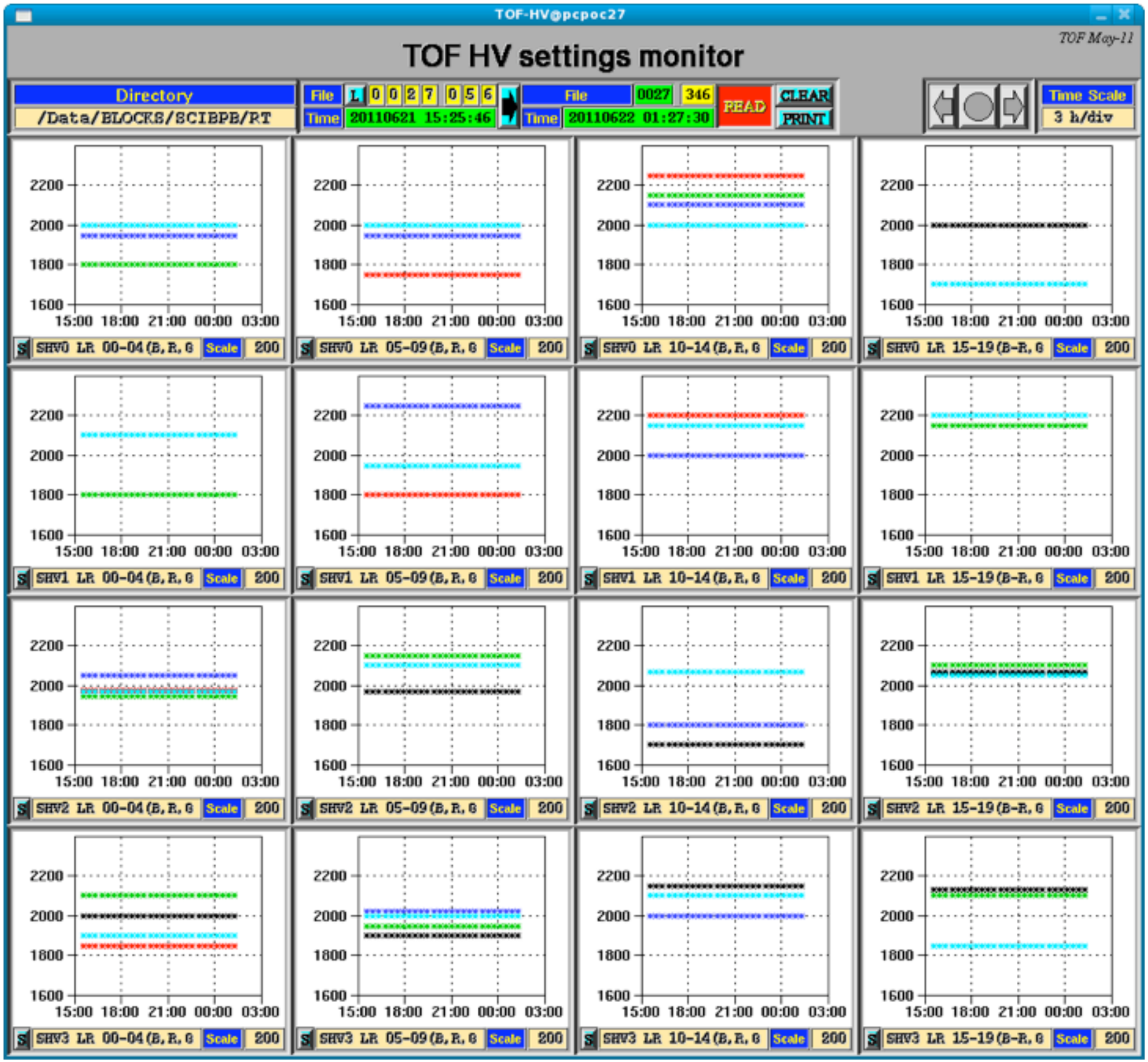


TOF Slow control Monitor: JLV1

The JLV1 monitor shows the FT, the LV1 and the TOF inputs to the trigger box.
FT - AMS fast trigger
LV1 - AMS LV1 trigger
CP S1n, CP S2n, ... CP S3p, CP S4p are the TOF signals going in inputs to the trigger board (JLV1) for the FT generation.



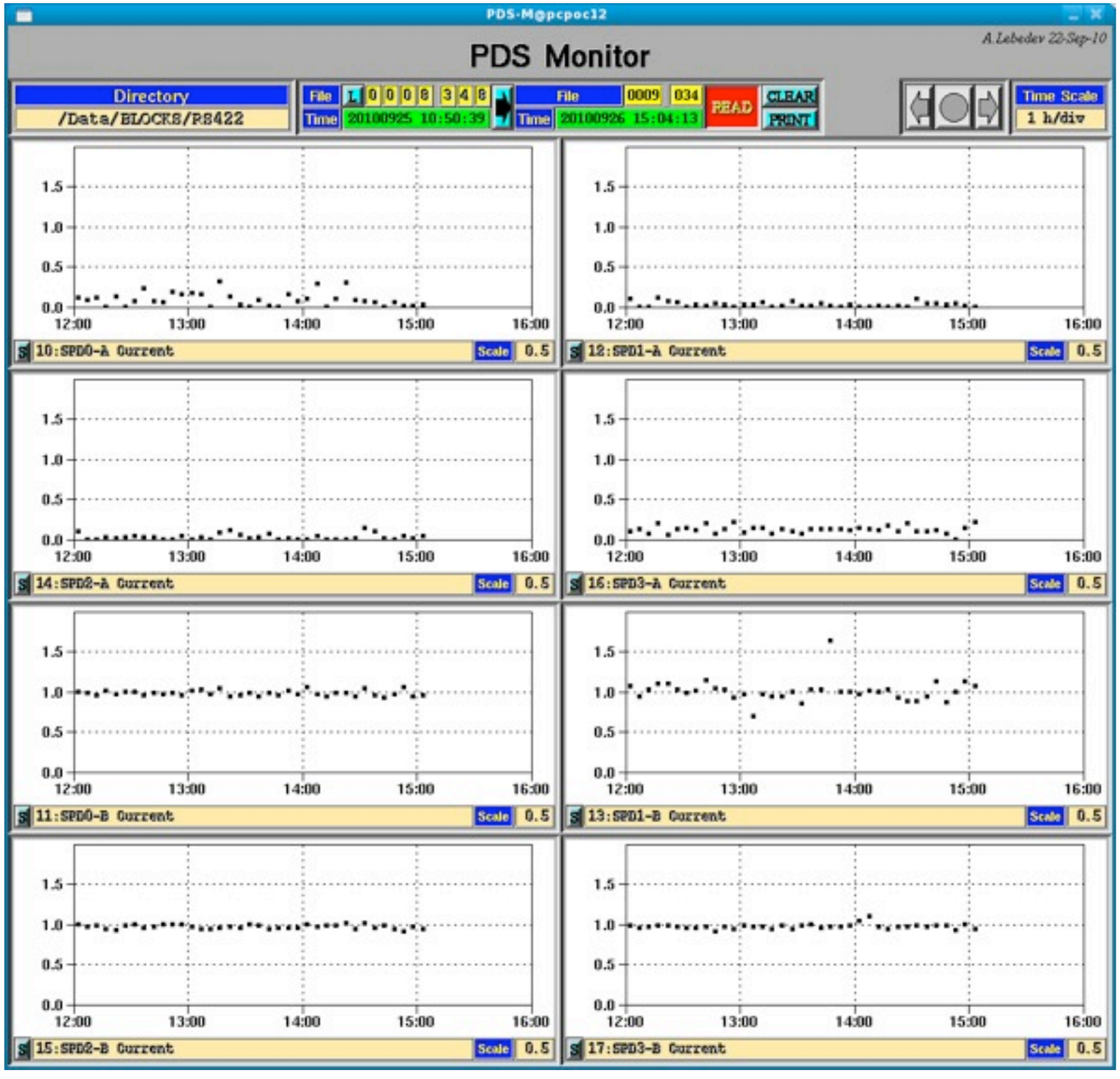
TOF Slow control Monitor: HV settings



TOF Slow control Monitor: PDS monitor

Time Of Flight crates and high voltage bricks are powered by 4 SPDs.

When TOF is powered and photomultiplier voltages ramp up at the standard values, the consumption of each SPD is about 1 A.



Event size Monitor: TOF

This is a general monitor, also used by the lead, to control the size of the events for each sub-detector.

The peaks are due to the South Atlantic Anomaly.