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Authors	ARONICA, Alessandro; LAZZAROTTO, FRANCESCO; Laky, Gunter; Svensson, Johan; Phillips, Mark
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BepiColombo SFT-FV at ESTEC 26/10/2015 & 02/11/2015

SERENA Instrument Summary Report

SERENA NPA-IS (Neutral Particle Analyzer - Ion Spectrometer)

prepared by	Alessandro Aronica alessandro.aronica@iaps.inaf.it, Francesco Lazzarotto, francesco.lazzarotto@iaps.inaf.it (INAF-IAPS), Gunter Lacky Gunter.Laky@oeaw.ac.at (IWF), Johan Svensson johans@irf.se (IRF), Mark Phillips mphillips@swri.edu (SWRI)			
checked by	Elisabetta De Angelis elisabetta.deangelis@iaps.inaf.it, Anna Milillo anna.milillo@iaps.inaf.it (INAF-IAPS)			
approved by	Stefano Orsini (INAF-IAPS), Principal Investigator stefano.orsini@iaps.inaf.it			
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	ADS (Airbus)	1
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CHANGE LOG

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26/11/2015	1	0		First draft

Acronyms and Abbreviations

- **AD**.....Applicable Document
- **AOCS**.....Attitude and Orbital Control System
- BC.....Bepicolombo
- AD.....Applicable Document
- ASI Agenzia Spaziale Italiana
- CEM Channel Electron Multiplier
- CGS Compagnia Generale per lo Spazio
- CPU Central Process Unit
- ECR Engineering Change Request
- EICD Electrical Interface Control Document
- EM Engineering Model
- EMC ElectroMagnetic Compatibility
- ESD Electrostatic Sensitive Device
- FM Flight Model
- FS Flight Spare (model)
- FSW Flight Software
- HV High Voltage
- IF InterFace
- MCP Micro Channel Plate
- MICD Mechanical Interface Control Document
- MPO Mercury Planetary Orbiter
- NA Not Applicable
- NPA-IS Neutral Particle Analyzer and Ion Spectrometer
- OP Operative
- RD Reference Document
- RH Relative Humidity
- S/S Sub-System
- TICD Thermal Interface Control Document
- **RD**.....Reference Document
- **ENA**.....Energetic Neutral Atoms
- **S/C**.....SpaceCraft
- **P/L**.....PayLoad
- **S/W** or **SW**.....SoftWare
- **H/W** or **HW**.....HardWare
- **OOL**.....Out Of Limit
- **FV**.....Functional Verification
- **OL**.....Orbit Load
- **DL**.....Data Load
- **CL**.....Closed Loop
- **MTL**.....Mission TimeLine
- **IST**..... Integrated (Sub-)System Test
- **AFT**.....Abbreviated Functional Test
- **CCS**..... Central Check-Out System (also core EGSE)
- **AIT**..... Assembly Integration and Test
- **AIV**..... Assembly, Integration and Verification
- **LAN**..... Local Area Network
- **NRB**..... Non conformance Review Board
- **NCR**..... Non Conformance Review
- **OBC**..... On-Board Computer
- **OBCP**..... On-Board Control Procedure
- **OBDH**..... On-Board Data Handling
- **EGSE**..... Electrical Ground Support Equipment
- **EM**..... Engineering Model
- **ETB**..... Engineering Test Bench
- **MIS**..... MPO I/F Simulator
- **TS**..... Technical Specification
- **SEPS**..... Solar Electric Propulsion System
- **SFT**..... System Functional Test
- **SCOE**..... Special Check-Out Equipment
- W.....Workmanship
- TBD..... To Be Defined
- TBW..... To Be Written

1 Reference Documents

N	Reference Id	Issue	Title
RD1	BC-ASD-TS-00047	1	MPO SFT2 SPECIFICATION
RD2	BC-ASD-TS-00001		System Operations Functional Test Module Specification
RD3	BC-ASD-TS-00043		MPO SFT-W and AFT Specification
RD4	BC-ASD-TS-00010		SERENA IST SPECIFICATION
RD5	BC-EST-RS-01140	2	BC Experiment Interface Document – Part A
RD6	BC-EST-RS-02522	1	SERENA instrument Interface Document Part-B
RD7	BC-SRN-MA-70001		SERENA PI EGSE User manual
RD8			
RD9			

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2 Introduction

This is the test report describing the measure collected by the SERENA PI egse, during the System Functional Tests SFT-FV at ESTEC, Noordwijk (NL).

This document provides a summary report for the testing activities SFT2-FV run on 26/10/2015 and 02/11/2015, that took place at ESTEC using MPO with payloads and the SERENA PFM,we'll describe the data received from the SERENA suite, collected by the SERENA PI egse, during the test sessions. Details on the requirements to be verified are given in other sections. The conduct of the tests is mainly covered by the staff of ASD and TAS-I and supervised by ESA. P/L instrument teams staff is also required for verification purposes.

The TM packets, the data respectively, which were used for this test report, were stored on the SERENA PI-EGSE.

In total SERENA produced 55910 TM packets during SFT2-FV run on 26/10/2015, 28730 HK and 27180 SCI. And 55910 packets during SFT2-FV run on 02/11/2015, 14963 HK and 23541 SCI.

The duration of the tests, was of nearly 9 hours for the 26/10 and of nearly 7 hours for the 02/11 total data volume was TBW.

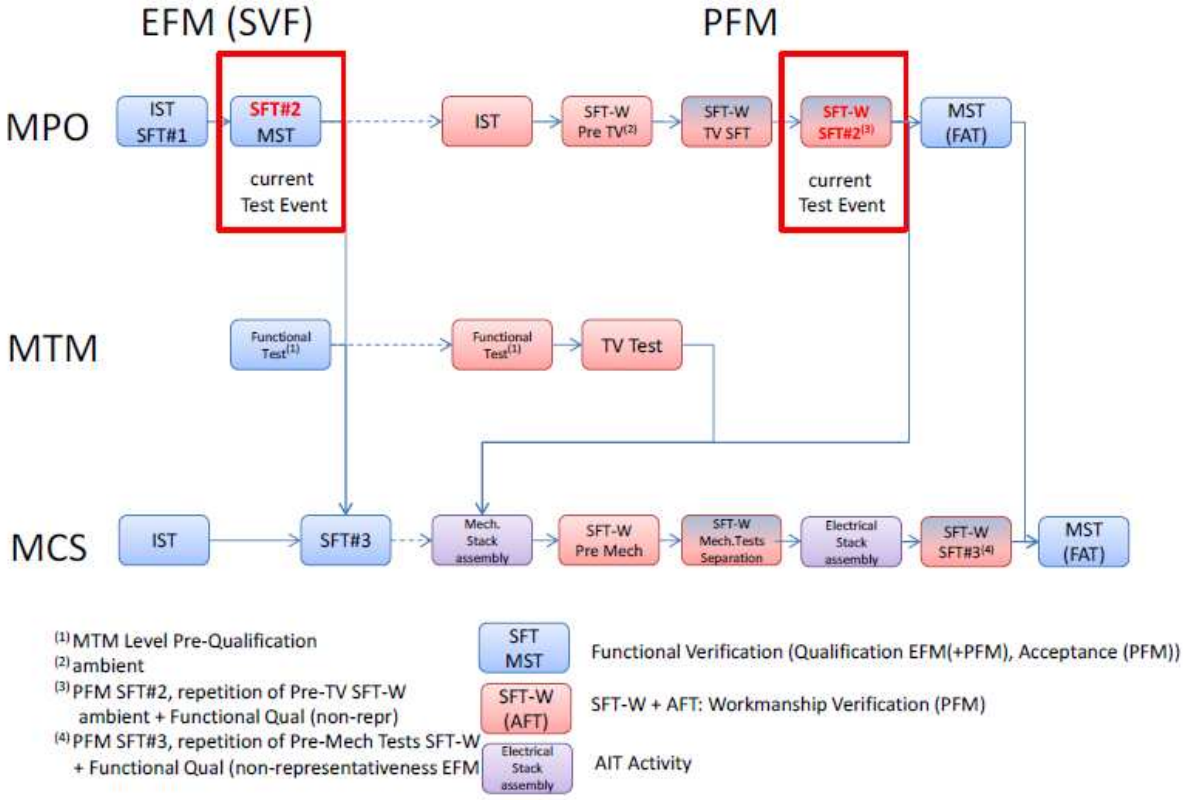
The behavior of SERENA was as expected, no unexpected events or errors occurred, the data showed no missing or corrupted packets except some jumps in the sequence counter (mostly STROFIO) and a peak on STROFIO current at 10:29 UTC of 02/11".

3 Background on the SFT-FV

The System Functional verification phase succeeds the Integrated Subsystem Tests for subsystems and the Payload, essentially concentrating on system level functions across subsystem boundaries. These tests cover all test cases and scenarios which are beyond the scope of the Integrated Subsystem Tests (IST) because they involve the concurrent operation of several (sub-)systems and payload.
In its final stage, the SFT will be performed with flight representative procedures and will be compiled from lower level functional tests, e.g. by re-using test modules from the various ISTs.
Hardware redundant channels will be used for dedicated configurations to check the complete cross coupling in the S/C. Similar to the IST, system relevant database items will be verified.
The objectives of MPO SFT-FV are

- Functional Verification:
- Verify MPO system performance of S/C functions by concurrent unit operations with representative data load under environmental conditions. This objective is achieved by a SFT-FV test consisting of parallel Platform and Payload operations in fligh representative configuration, including AOCS Hardware in the loop.
- Verification of individual MPO System Operations Functions on PFM due to nonrepresentativeness of parts of EFM. This objective is achieved by execution on the PFM of a series of indiivdual SysOps Modules defined in [System Operations Functional Test Module Specification]
- Workmanship Verification: Verify MPO S/C units health & integrity after flight model integration for various units with final CSW and FCESW version.This objective is achieved through the SFTW test consisting of subsystem tests in Open Loop covering all redundancies, mainly by reusing modules from the IST and confirming the results obtained before. These tests are defined in the SFT-W and AFT Specification ([MPO SFT-W and AFT Specification]).

The SFT-FV is executed after thermal environmental campaign on MPO and concludes the qualification of MPO system functions according to [MPO SFT-W and AFT Specification]. The overall qualification and acceptance of MPO system operational concept is finally achieved by the Mission Simulation Tests.


EFM (SVF)
PFM
MPO
IST SFT#1
SFT#2 MST
current Test Event
IST
SFT-W Pre TV(2)
SFT-W TV SFT
SFT-W SFT#2(3)
current Test Event
MST (FAT)
MTM
Functional Test(1)
Functional Test(1)
TV Test
MCS
IST
SFT#3
Mech. Stack assembly
SFT-W Pre Mech
SFT-W Mech.Tests Separation
Electrical Stack assembly
SFT-W SFT#3(4)
MST (FAT)
(1) MTM Level Pre-Qualification
(2) ambient
(3) PFM SFT#2, repetition of Pre-TV SFT-W ambient + Functional Qual (non-repr)
(4) PFM SFT#3, repetition of Pre-Mech Tests SFT-W + Functional Qual (non-representativeness EFM
SFT MST
Functional Verification (Qualification EFM(+PFM), Acceptance (PFM))
SFT-W (AFT)
SFT-W + AFT: Workmanship Verification (PFM)
Electrical Stack assembly
AIT Activity

P/L science downlink

During the science operations phase, two downlink mechanisms will be verified (see [RD-07])

- Flexible downlink: Used typically for high data rate producers, in order to distribute the data load over the X-Band (VC2) and the Ka-Band (VC3).
- Selective downlink: For saving downlink bandwitdh, the selective downlink functionality allows to select the data onboard to be downlinked with high resolution from dedicated Packet Stores. For this, the low resolution data contained in separate PS is analysed on ground in order to decide which periods are interesting from the high resolution data.

The main objective of the SFT-W is the workmanship validation, which is achieved through subsystem tests in Open Loop covering all redundancies, mainly by reusing modules from the IST and confirming the results. Since the SFT-W & AFT are performed several times during the S/C AIT, the test is specified separately in [MPO SFT-W and AFT Specification].

In the frame of the SFT-FV, the SFT-W is performed with the goal to exclude any workmanship issues for the units replaced after the MPO TB/TV test. Since the configurations R_A0 and R_B0 are covered in the SFT-FV test, the SFT-W is performed only in the configurations R_A1 and R_B1.

In general, the AFT is performed prior and after any environmental load on the S/C (environmental tests or transport) in order to ensure the proper functioning of the test setup, i.e. S/C + EGSE+ cabling.

For the SFT-FV, this is nominally not required, as the test setup can be verified also with the SFT-W and no major environmental load is injected into the MPO.

SFT-FV-W

The SFT-W shall be performed in the redundancy configuration R_A1 and R_B1. This completes the redundancy coverage, as the SFT-FV is performed in R_A0
and R_B0.

SFT-FV Sys Ops Modules

During **P/L parallel Switch On**, SERENA Switch On CALL_MOD SERENA_1_SWON will be operated.

During **P/L Functional Verification via MTL** Run SERENA SFT Functional Performance operations in parallel (all starting together) CALL_MOD SERENA_50_SFT_FUNC_VER will be operated. The typical duration is 1:20 hr per Module running in parallel.

During **P/L SFT Orbit Load Test via MTL** Run SERENA SFT Data Load operations in parallel (all starting together) CALL_MOD SERENA_51_SFT_ORB_LOAD will be operated.The typical duration is 01:00 per module running in parallel

KSE041 SERENA P/L OBCPS OBCP for power on, modes, power off, individual shutdown, maintenance, etc. R_A0

Data to be acquired during the test are the following:

- Test Session Logs
- All the TM and TC generated for the test shall be recorded for post processing availability.
- Standard Session Report consisting of:
    - Test Sequence Log
    - Events Log
    - TC Log
    - Test Environment Report (Version information)
    - System Events
    - Test Bench Configuration (either in the Standard Report or as TCDL)

The restrictions in operating SERENA P/L instrument during the tests are the following:

- PICAM: No HV operations allowed
- MIPA: No HV operatoins allowed
- ELENA: No HV operations allowed. No shutter operations allowed.
- Strofio: HV safe operations allowed.

The post evaluation shall be performed according to specified success criteria. As part of the standard post evaluation, the standard session report shall be checked for unexpected events and unexpected negative TM/TC verifications.

- The test shall include online checks of TM parameter and event packets for test success verification.
- Real time telemetry packets and SSMM stored/retrieved ones should be compared for quantity/consistency between them and also wrt the payload mode.

For the SFT, the following verification of acquired data rate/amount wrt. predicted data rate will be performed and shall be documented in the Test Report

- power profile of the executed operations (plot: power over execution time)
- data-rate profile of the executed operations (plot: data-rate over execution time) for science via VC2/VC3 during SFT-FV by analysis of the P/L reports
- total data-volume from the executed operations (= number)

the SFT-FV consists of several tests

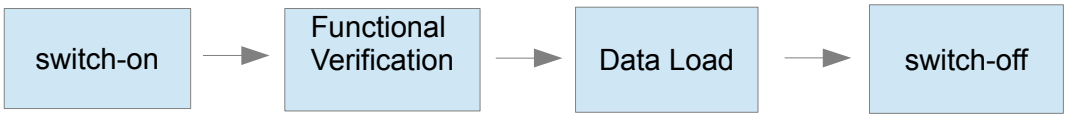
- SFT-FV (SFT-FV-FV): a contiguous test with the purpose of functional qualification with parallel MPO platform and payload operations
- SysOps Modules: single modules from the ETB SysOPS FV campaign to be repeated on PFM due to non-representativeness of parts of the ETB
- SFT-W: a contiguous test with the purpose of PFM workmanship and health&integrity verification
- AFT (not required nominally for SFT-FV): a contiguous test with the purpose to verify the test setup prior / after environmental loads.

During SFT-FV-FV, the P/L will be operated by two sets of modules, according to the picture below.

Functional Verification: The objective is to make a functional check of all the experiments in order to ensure all elements of the experiments are working properly. These operations are executed in parallel (duration 1 hour) in order to check-out all experiments at the same time. It will be the basis for the SFT on the FM which will be executed before and after major test events and/or transport in order to check health and workmanship.

Data Load: The objective of the Data Load test is to configure all the experiments to a high data load in order put a load on the system. The test is proving that the system provides adequate resources to the onboard foreseen operations, and represents a qualification of the DMS functionality in support of the P/L. These operations are executed in parallel (duration 1 hour and 20 minutes - half an orbit) in order to have all experiments powered and producing data-load at the same time, assuring a maximum load on the system.

Please note that in general the operations of the Functional Verification are more complex and more TCs are involved. Therefore this test provides a higher load on the MTL.



All timestamps and dates in this report (if not expressely specified) will be given in CEST and hours are expressed in 0-24.

4 List of Activities

The time-table of the SFT-FV tests performed in ESTEC was the following
On Monday, the 26th October 2015 and Monday, 2nd November 2015

1. Monday, 26th of October: SFT-FV this TBW was executed
2. Monday, 2nd of November: SFT-FV that TBW was executed

5 SERENA H/W & S/W Configuration

Subsystem	Model level	SW version
SRN PI-EGSE	N/A	1.8.37
SRN Data Base	FM	ASCII_SERENA_MIS_DB_V1.9_17122013r045_FM
SRN SCU App SW	FS	V36
ELENA App. SW	FS	V25
PICAM App. SW	FM	V34
MIPA	FM	Included in SCU SW
STROFIO	PFM	9

5.1 Details on SERENA EGSE

The PI EGSE used at ESTEC during these tests is installed on a Sony VAIO PC

PC HW details:
description: Notebook
product: VPCSB2L1E
vendor: Sony Corporation
version: C60930YV
serial: 27547507-5000603
width(architecture): 64 bits
capabilities: smbios-2.6 dimi-2.6 vsyscall64 vsyscall32
configuration: boot=normal chassis=notebook uuid=D0DA0C17-8088-E011-82C7-1AF95D4948F0
Motherboard: VAIO
BIOS: INSYDE version R1031H4 (25/94/2011), size 1MiB, 2496KiB
Memory: description: SODIMM, size 4GiB, width 64 bits,
CPU: product: Intel(R) Core(TM) i3-2310M CPU @ 2.1 GHz, size 800MHz, capacity: 2100MHz, width 64 bits, clock 100MHz
CACHE: L1 cache 128 KiB, L2 cache 512 KiB, L3 cache 3MiB
PCI: Sandy Bridge DRAM Controller, size; 32 bits, clock 33MHz
HD DISK: description: ATA Disk, product: Hitachi HTS54505, size 465GiB (500 GB), logical name /dev/sda0
CDROM: DVD-RAM writer, product: DVD-RAM UJ8A2AS, vendor: MATSHITA

System: x_86_64 GNU/Linux
kernel: 2.6.32-5-amd64 #1 SMP Mon Sep 23 22:14:43 UTC 2013
Distributor ID: Debian
Description: Debian GNU/Linux 6.0.8 (squeeze)
Release: 6.0.8
Codename: squeeze

Gnome Desktop
Version: 2.30.2
Build Date: 11/12/2010

PI-EGSE Network Configuration:

ifconfig
eth0 Link: Ethernet HWaddr F0:BF:97:5D:41:41
inet addr: 192.168.201.210 Bcast: 192.168.210.255 Mask: 255.255.255.0
RX bytes: 3.1 GiB TX bytes 2.7 GiB (22/10/2015 10:35)

SERENA PI-EGSE in ESTEC is having on ifconfig eth0 192.168.201.210
but is accepting ssh connections both on IP 192.168.212.210
and 192.168.201.210

5.1.1 SERENA-EGSE START UP

To start up the Serena PI-EGSE follow the steps below:
1) Access to the EGSE laptop with the following credentials:
User: serena
Password: IC-00045
If needed in order to access as super user you can use the following credentials:
User: root
Password: RS-01140
2) Setting LAN configuration
It is necessary to configure the LAN address of the EGSE with the following commands executed in root mode:
· ifconfig eth0 down
· ifconfig eth0 <IPaddress> netmask 255.255.255.0 up
To check the configuration you can use command: ifconfig eth0
Optionally if necessary it is possible also configure the gateway in this way:
· route add default gw <IPaddress> eth0
to check the configured gateway you can use the command: route
The LAN configuration of PI-EGSE depends on the test environment, usually the following address shall be used:
· IP address 192.168.3.5 and gateway 192.168.3.1 in the MIS test environment,
· IP address 192.168.212.210 or 192.168.201.210 in the CCS test environment,
3) Disable of firewall
It is necessary to disable the firewall of the EGSE with the following commands executed in root mode:
· iptables –F
· iptables –X
· iptables –P INPUT ACCEPT
· iptables –P OUTPUT ACCEPT
· iptables –P FORWARD ACCEPT
4) Check of EGSE LAN ports used in communication of the application SW
To verify the EGSE ports used by EGSE application SW view the file named serena.config in the EGSE running directory and search for fee ports as reported in the EGSE user manual RD[1] par. 4.3
5) Start execution of SERENA application SW
To start the application SW on the EGSE start with a shell script the program named serena.sh in the EGSE running directory as reported in the EGSE user manual par. 4.3.
In case of the PI-EGSE used at ETB with Serena EM units the EGSE shall started with the program named serena_em.sh
6) Start execution of MIPA spectrogram
In order to see the MIPA spectrogram ExM window visualization it is necessary to launch the shell:
./priv/bin/mipa_spectrogram.sh
The spectrogram needs to open the fifo file MIPA in the directory ./priv, if this file does not exist you can create
in the following mode:
serena@serena-gse2:~/egse$ mkfifo ./priv/

PI-EGSE SW REMOTE CONNECTION SETTINGS

The EGSE can be connected via a remote dedicated IP channel depending on the localization of the machine.
In order to see remotely the EGSE desktop it is necessary:
1. Execute the start up sequence of the PI-EGSE as reported in chapter 5,
2. Launch in a shell of the PI-EGSE the VNC server
· $ ./vnc_start.sh
To connect to the EGSE it is necessary to run VNC viewer on the local machine and open a connection to the IP address of the EGSE (on the CCS LAN is 192.168.212.210 for the ESTEC egse or 192.168.201.210) and enter with the usual password IC-00045.
The connection to remote LAN depends on the company policy.
For the EGSE localized in ETB it is necessary to :
· Install on the local machine “Juniper Networks” application
· Connect to the web site: https://bepico-partner.astrium.eads.net or for the ESTEC egse https:195.169.140.202
· Acces with the following credentials:
ID: xxa10906
Password: Password reserved to CGS team
ID: xxa101401
Password: Password reserved to IRF team
ID: xxa101402
Password: Password reserved to SWRI team
ID: xxa101403
Password: Password reserved to OEAW team
ID: xxa101404
Password: Password reserved to IAPS team

6 Activity Summary

6.1 Measurements on monday 26 October

The offline analysis of the data related to this day was performed loading file 2015-10-26_tm.dds Containing 28730 SERENA HK Packets

Start: 2015-10-26 11:40:00

Stop: 2015-10-26 21:00:00

Packets data loading started at ~10:40 and ended at ~12:40

Measurements were loaded flawlessly by the EGSE showing that measurements are divided in two sets: from the start till ~15:05 and from 18:50 and then on.. Strange but Statitstics tab on the egse was not updated. To be checked this behaviour loading before science packets data file (that fille the statistics tab correctly) and then HK packets data file.

After that, the science packets file 2015-10-26_sc.dds was loaded, loading started at 13:37 and ended at 13:41. The Science data packets file is containing 27180 SERENA science packets, when loading ended

EGSE packets tab is saying that 26736 packets were received

Start: 2015-09-26 12:07:00

Stop: 2015-09-26 18:16:00

OK! loading started at hh:mm and ended @ hh:mm, when loading data 5 “error packet sequence check, PID 104, PCAT 12 Src/Dest ID 0 sequence error, 0 is not xxx related to 5 discontinuities in the sequence counter of STROFIO: 0 in the sequence counter was read instead of 440, 683, 7132, 8592, 2878. In the end data looks nominal

Received Packets		
SUBSYSTEM	**HK PKTS**	**SCI PKTS**
SCU		-
PICAM	???	4273
ELENA	???	355
MIPA	???	1085
STROFIO	???	21023

Data are nominal in the ELENA Science Graph, data are nominal in the MIPA Science Graph, data are nominal in the PICAM Science Graph, data are nominal in the STROFIO Science Graph.

During the SFT-FV run on 26/10/2015 TBW was monitored and also TBW was noted.

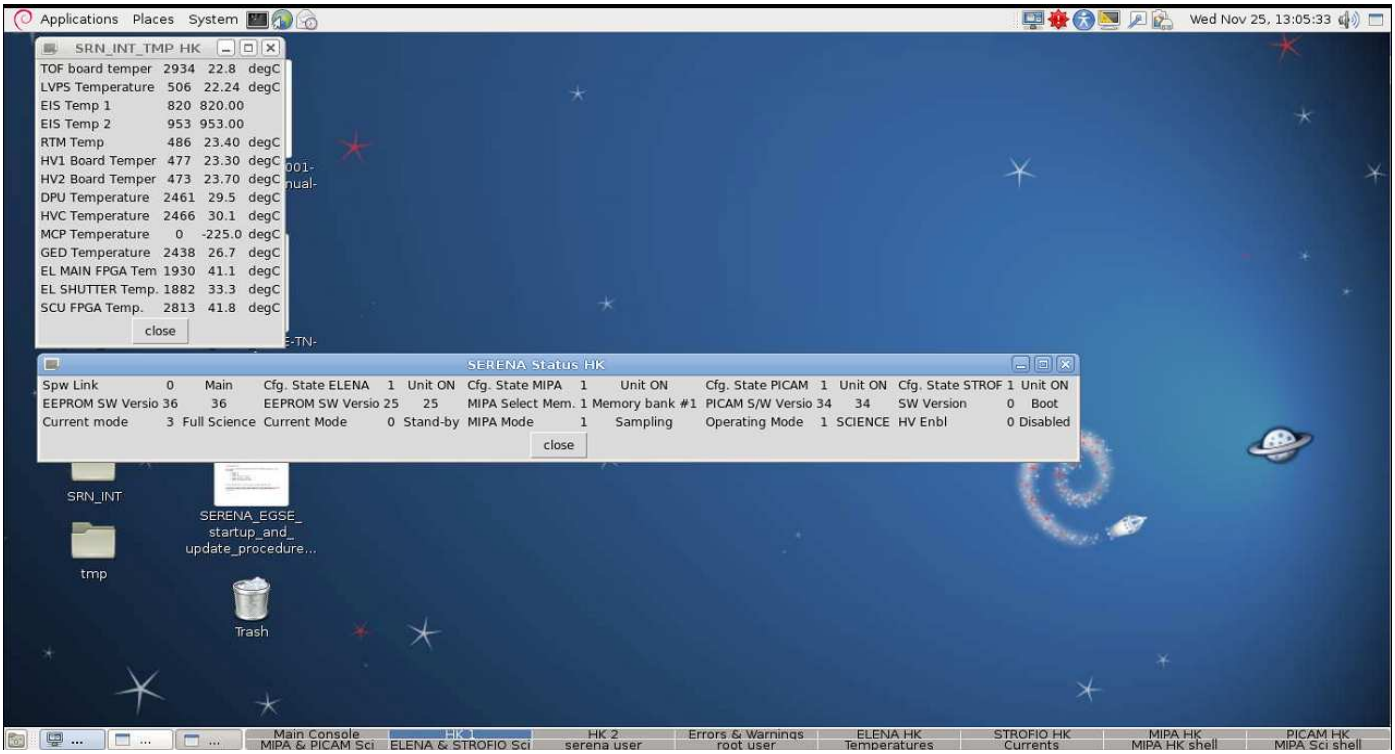


Fig. 1: SERENA Temperatures and Configuration 2015-10-26

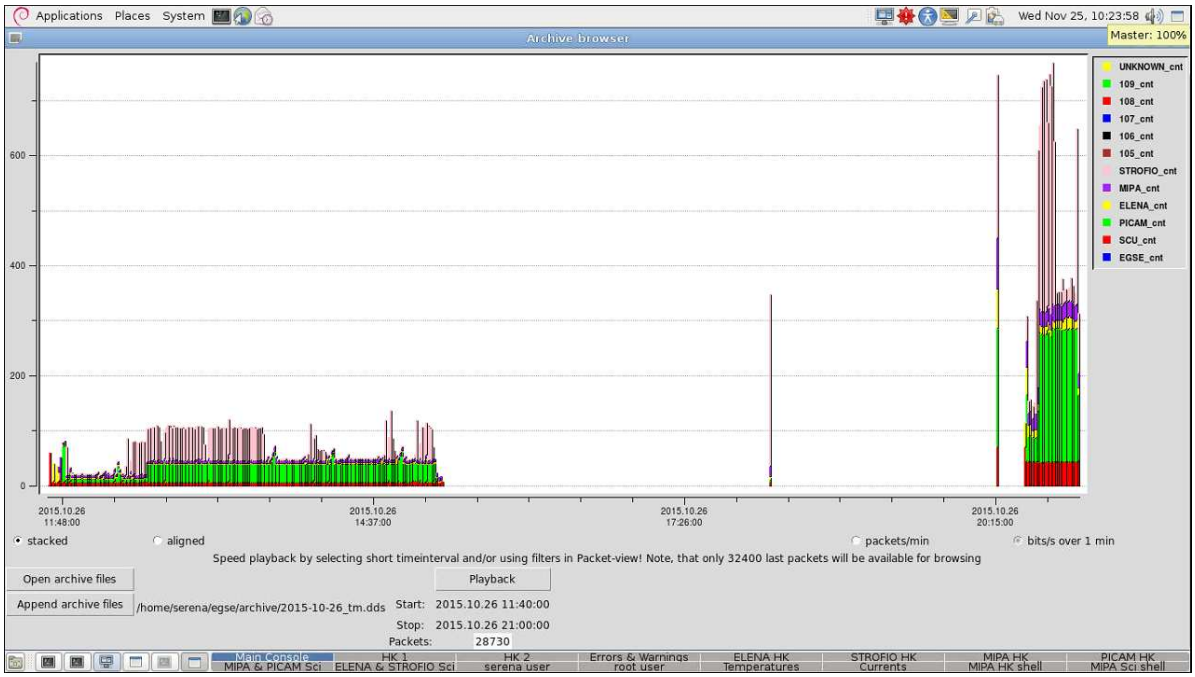


Fig. 2: SERENA HK Packets rate distribution 2015-10-26

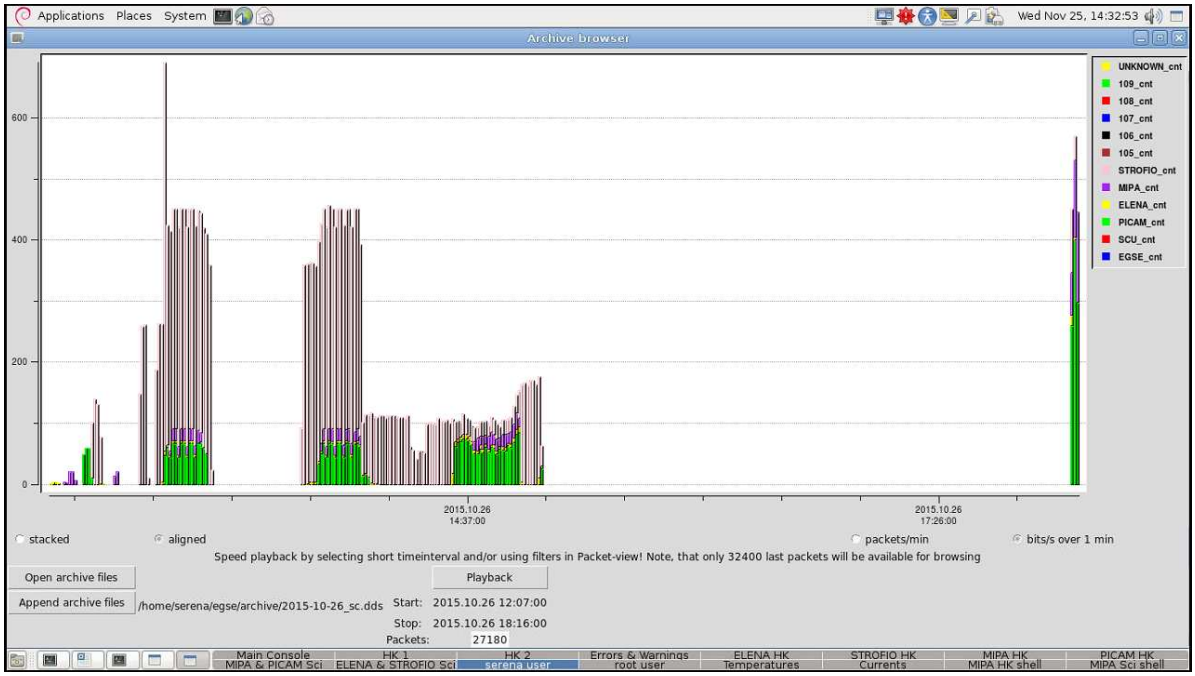


Fig. 3: SERENA Science Packets rate distribution 2015-10-26

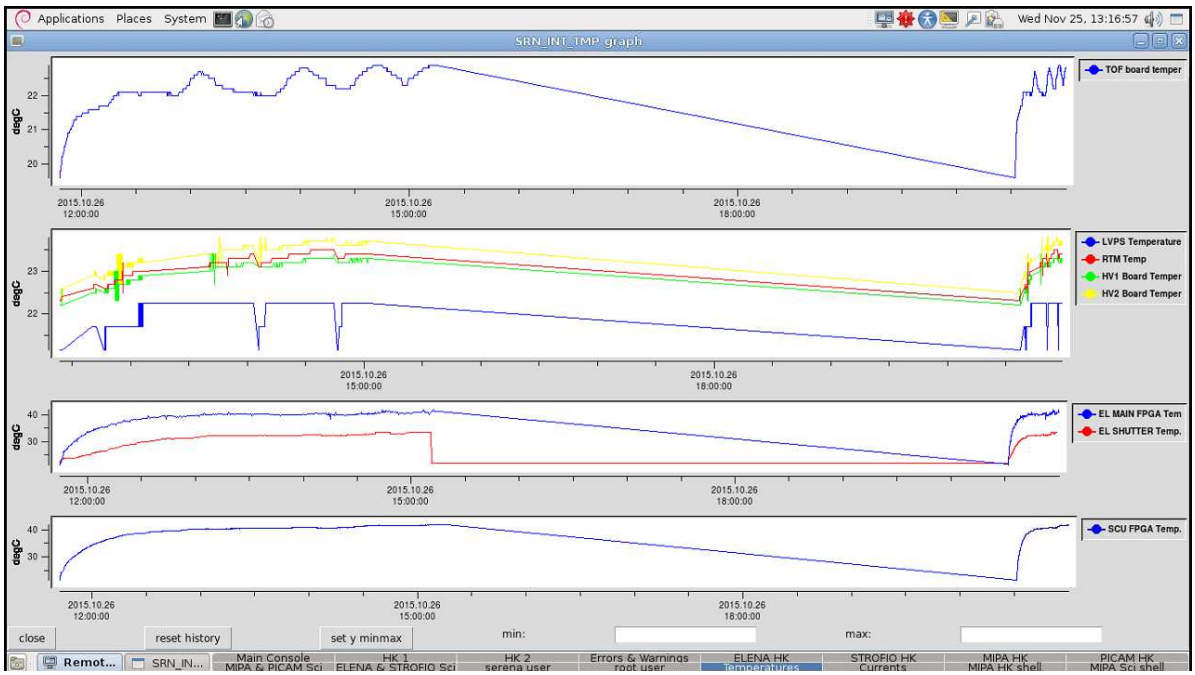


Fig. 1: SERENA Temperatures 2015-10-26

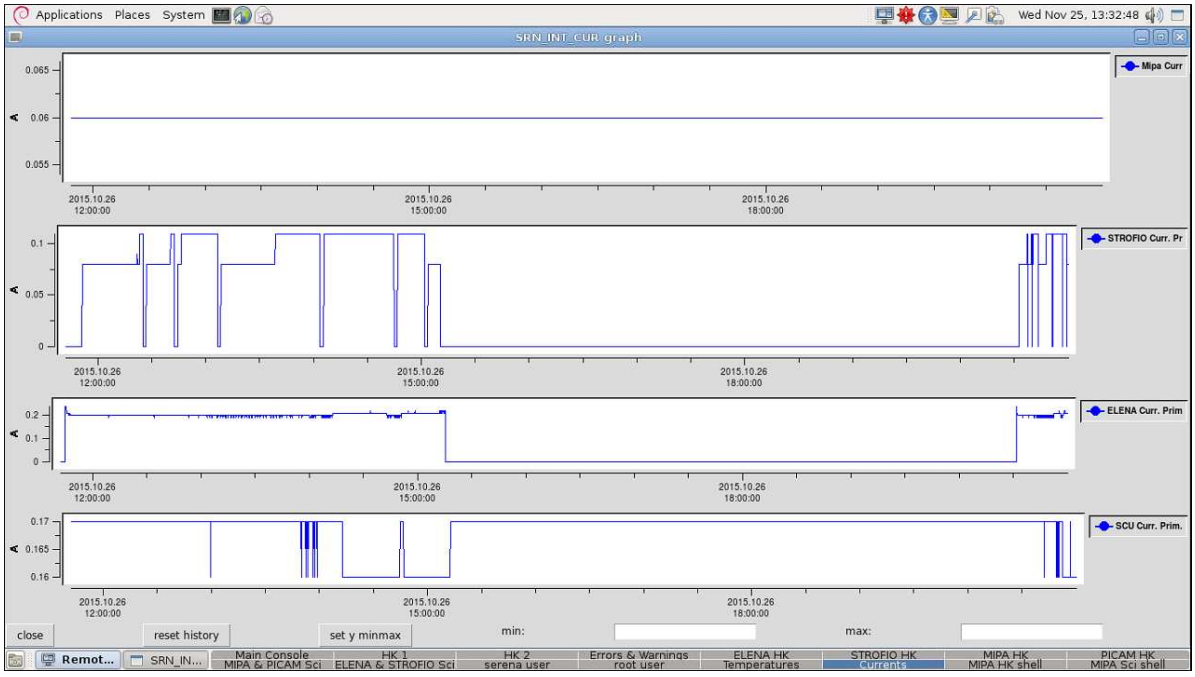


Fig. 4: SERENA Currents 2015-10-26

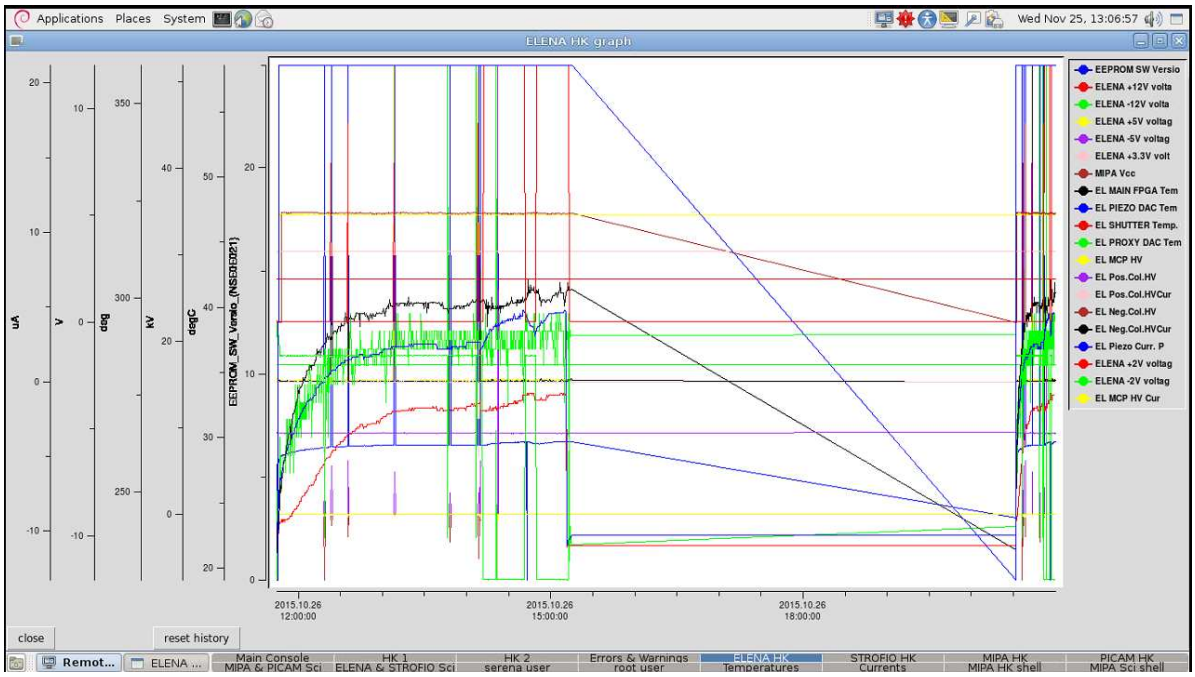


Fig. 5: ELENA HK 2015-10-26

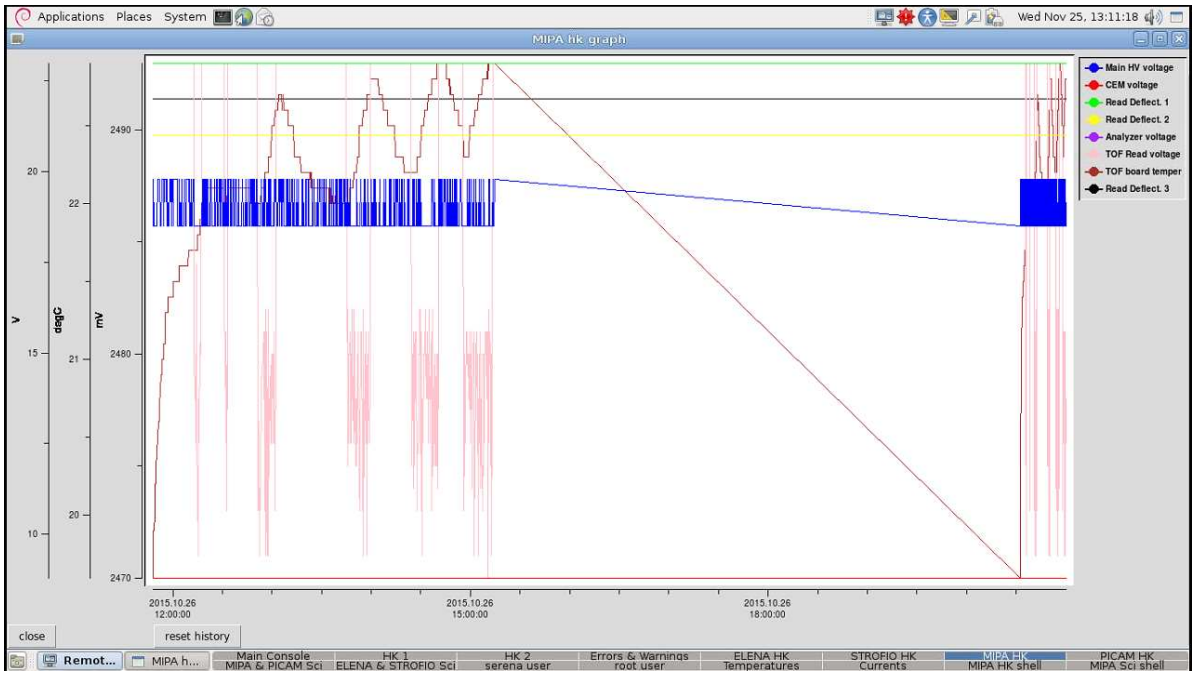


Fig. 6: MIPA HK 2015-10-26

Fig. 7: STROFIO HK 2015-10-26

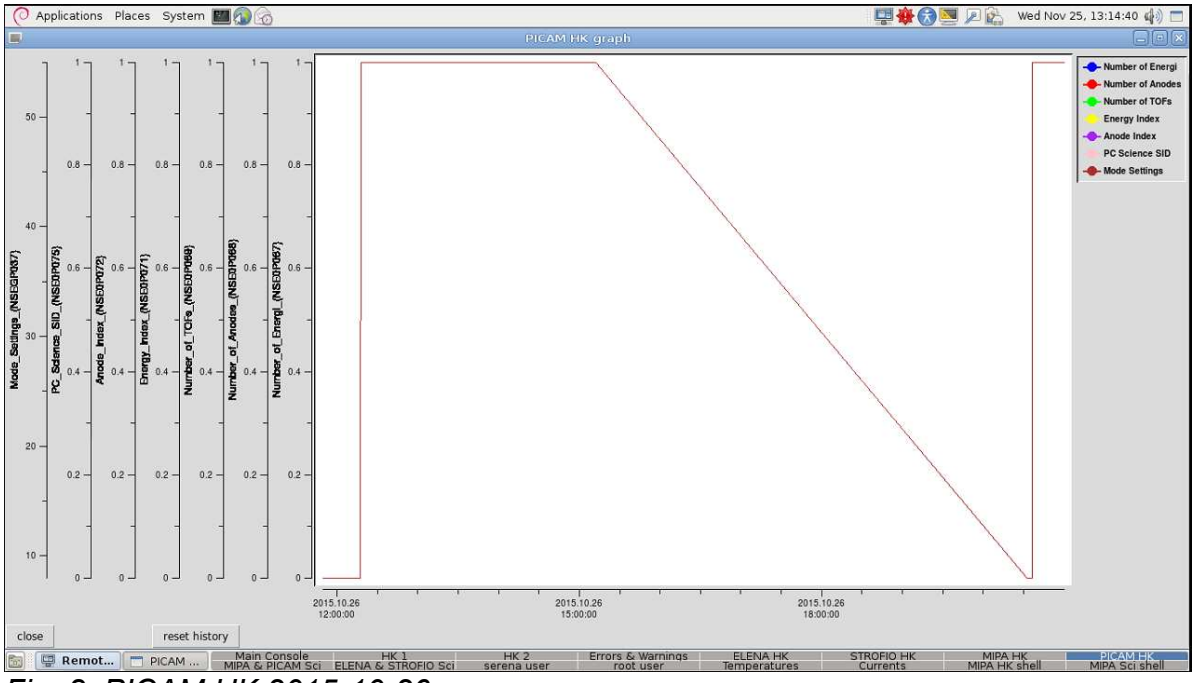


Fig. 8: PICAM HK 2015-10-26

6.2 Measurements on Monday 02/11

The offline analysis of the data related to this day was performed loading file 2015-11-02_tm.dds Containing 14963 SERENA HK Packets

Start: 2015-11-02 09:28:00 (UTC)

Stop: 2015-11-02 16:06:00 (UTC)

Packets data loading started at ~15:40 and ended at ~15:55

Measurements were loaded flawlessly by the EGSE showing that measurements contained in HK packets are mostly concentrated in the period from the start till ~12:45 UTC and a little part at around 16 UTC. few warnings and errors was detected. The Statistics tab of the egse is not showing the distribution of HK packets for the different SERENA subsystems to try loading HK after science packets data file. Again a peak on the STROFIO current was detected at ~10:29 UTC. A short spike of current at 0.6 A was measured by the parameter “STROFIO Curr. Pr.” that usually as an average value of 0.1 A.Searching events in the same period from the science data graph “STROFIO Basic” we can see that a step in the science data is detected starting from ~12:22UTC and then on.

After that science packets file 2015-11-02_sc.dds was loaded

containing 23541 SERENA science packets

Start: 2015-11-02 10:08:00

Stop: 2015-11-02 16:06:00

82% of the SERENA science packets during this run are STROFIO packets. During data loading no warnings (yellow) appeared on the log tab and a 6 errors (red) “packet sequence check, PID 104, PCAT 12 Src/Dest ID 0 sequence error, 0.is not xxx” . Only STROFIO had 6 discontinuities in the sequence counter.

Received Packets			
SUBSYSTEM	**EVT**	**HK**	**SCI**
SCU			-
PICAM			3043
ELENA			261
MIPA			721
STROFIO			19464

Data are nominal in the ELENA Science Graph, data are nominal in the MIPA Science Graph, data are nominal in the PICAM Science Graph, data are nominal in the STROFIO Science Graph..

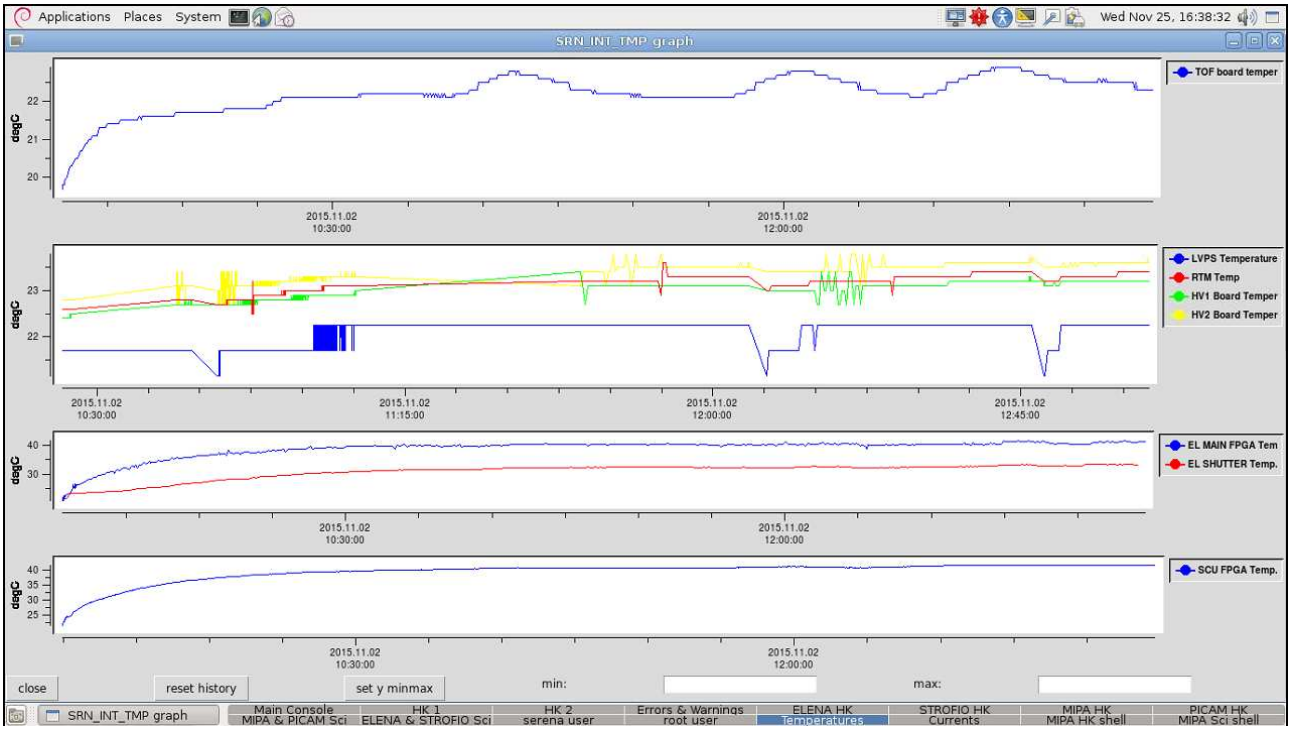


Fig. 9: SERENA Temperatures 2015-11-02

Fig. 10: SERENA Currents 2015-11-02

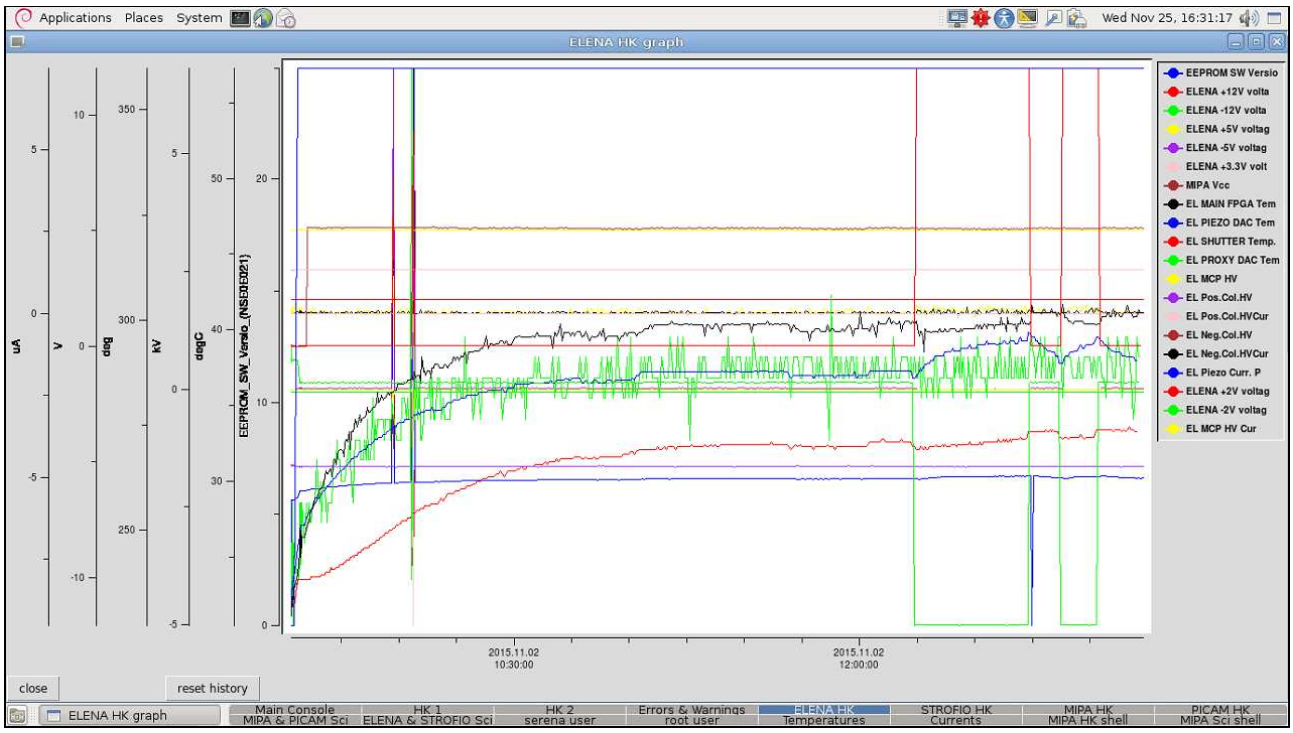


Fig. 11: ELENA HK 2015-11-02

Fig. 12: STROFIO HK 2015-11-02

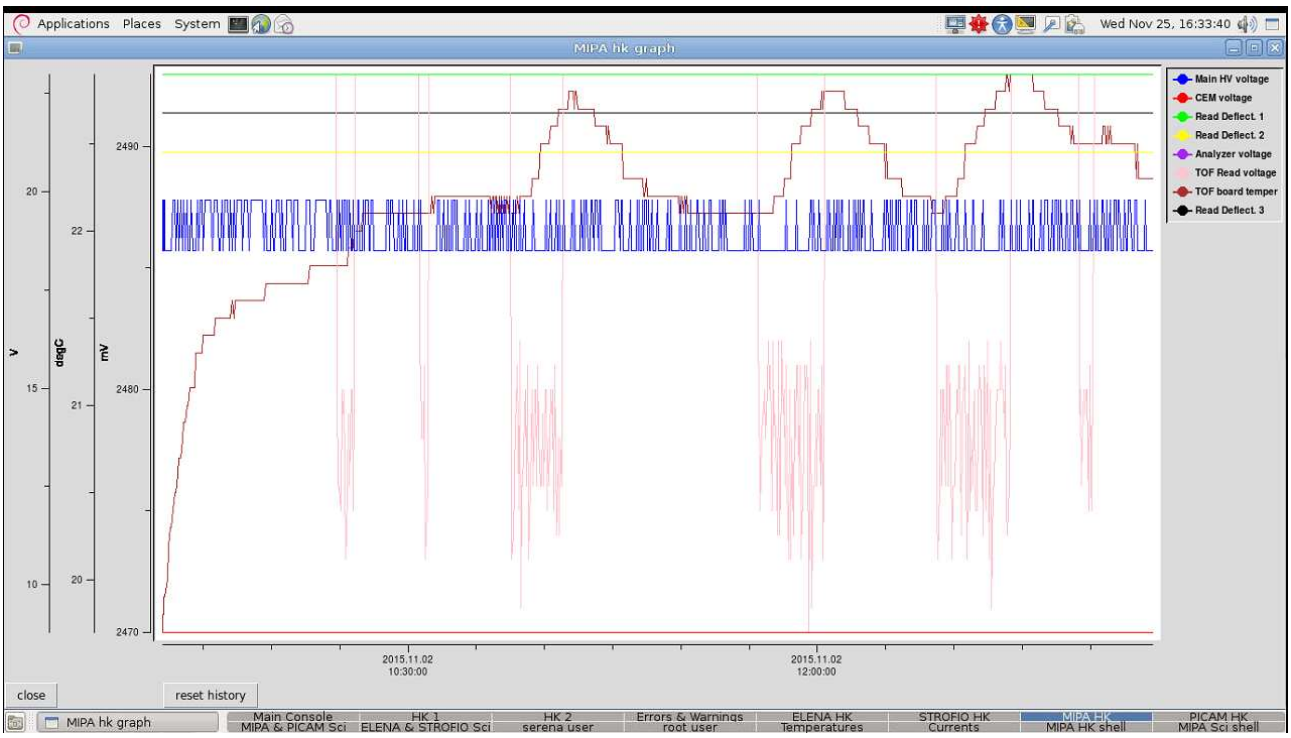


Fig. 13: MIPA HK 2015-11-02

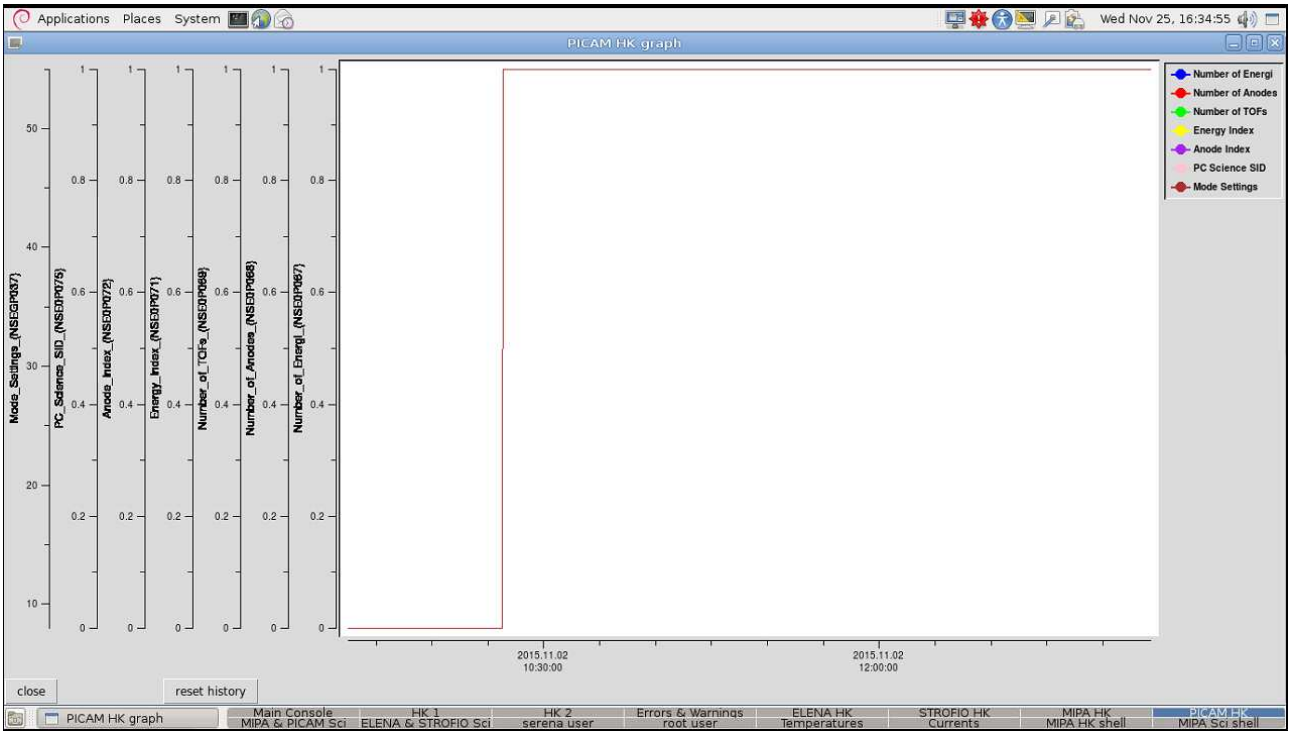


Fig. 14: PICAM HK 2015-11-02

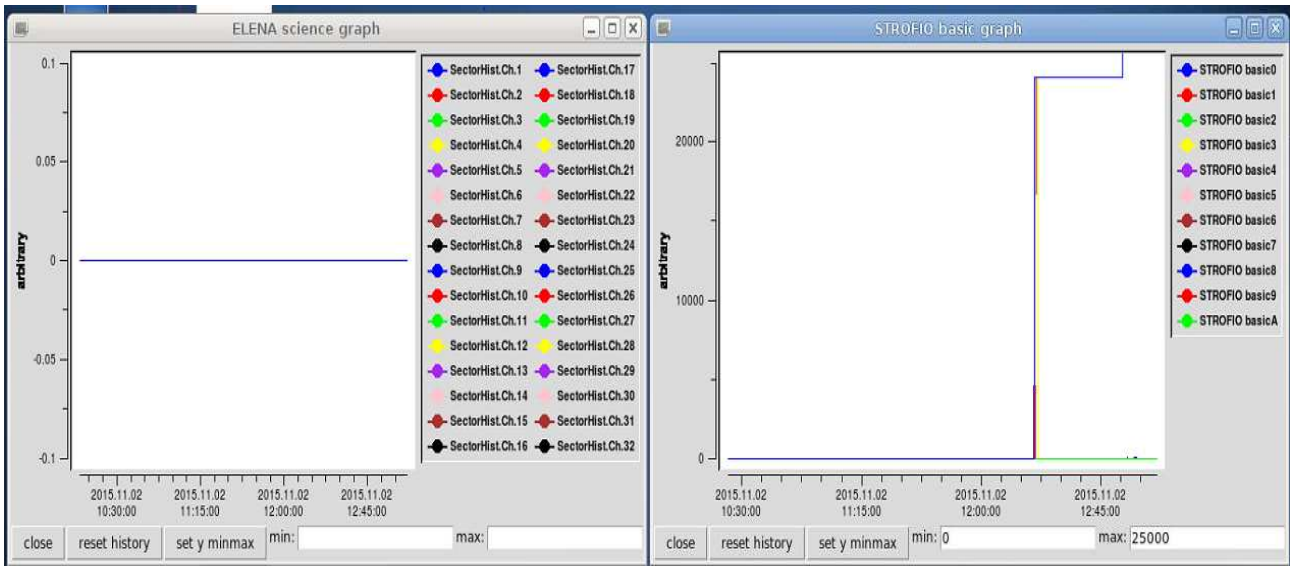


Fig. 15: ELENA & STROFIO Science 2015-11-02

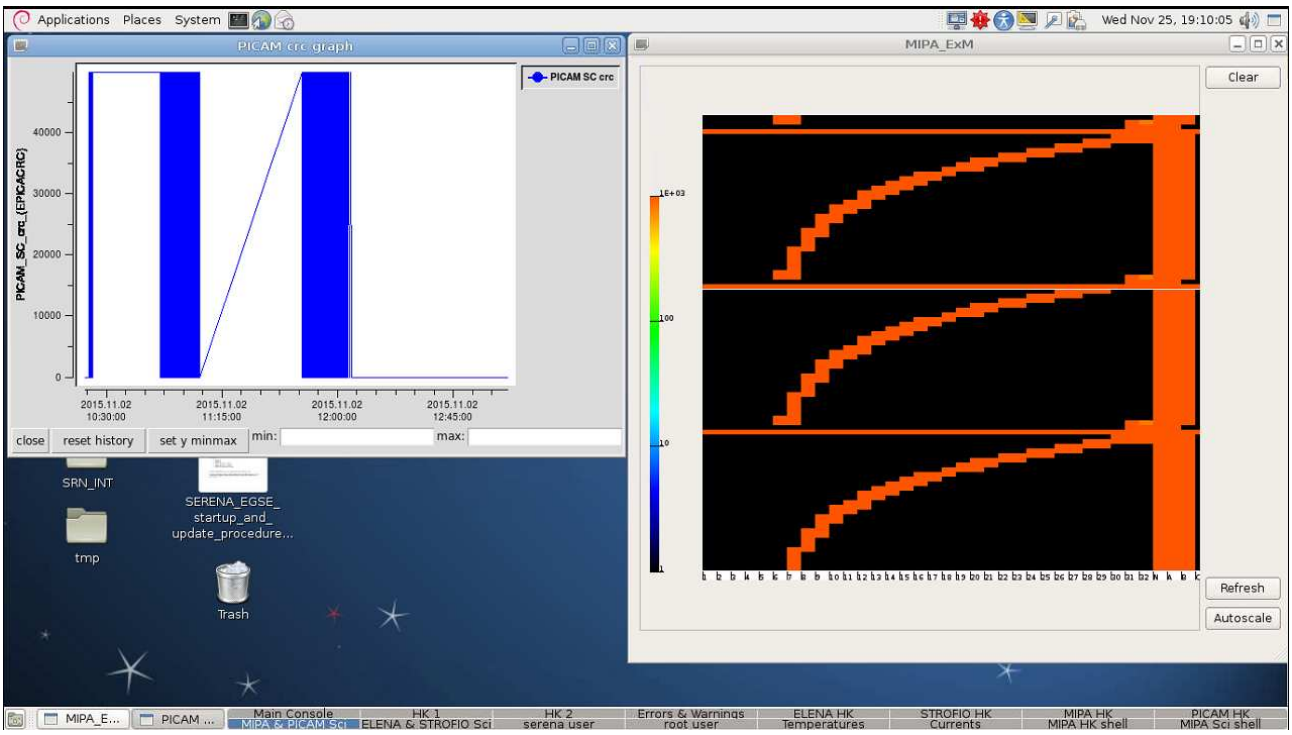


Fig. 16: MIPA & PICAM Science

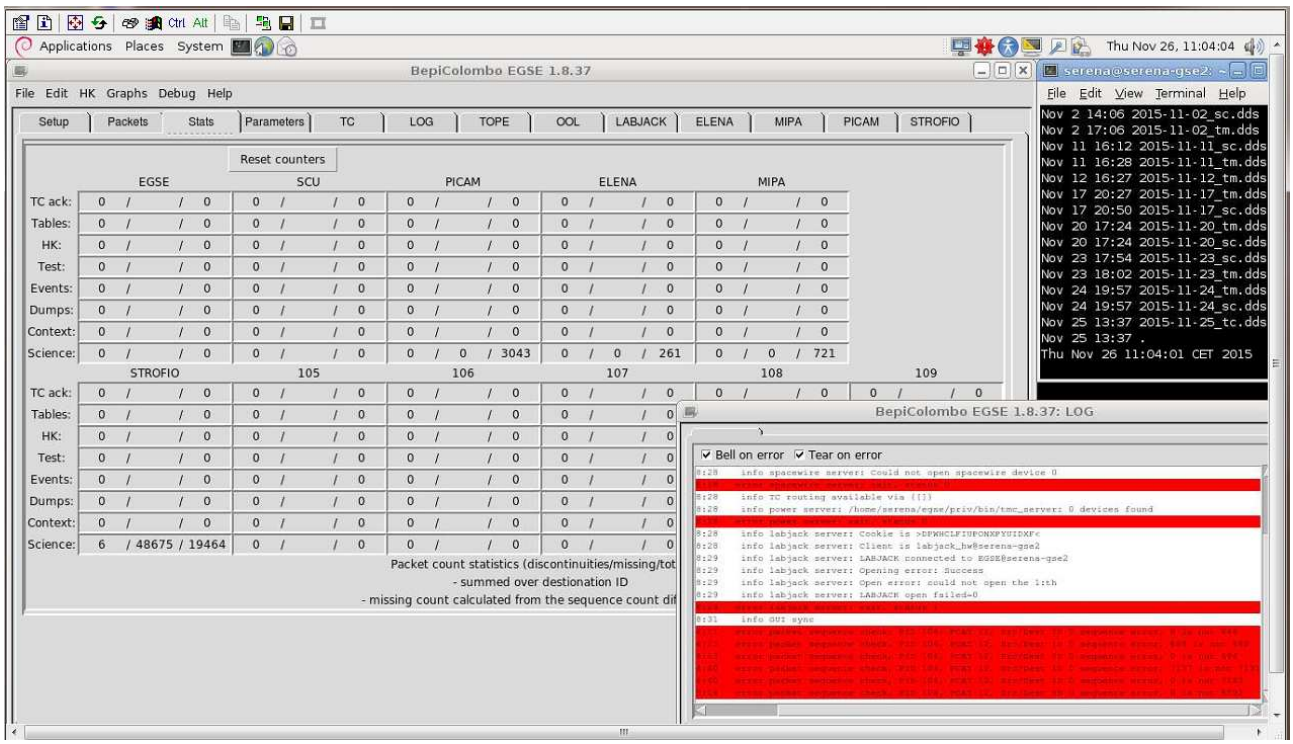


Fig. 17: SERENA Science Packets Statistics 2015-11-02

Fig. 18: SERENA TBD

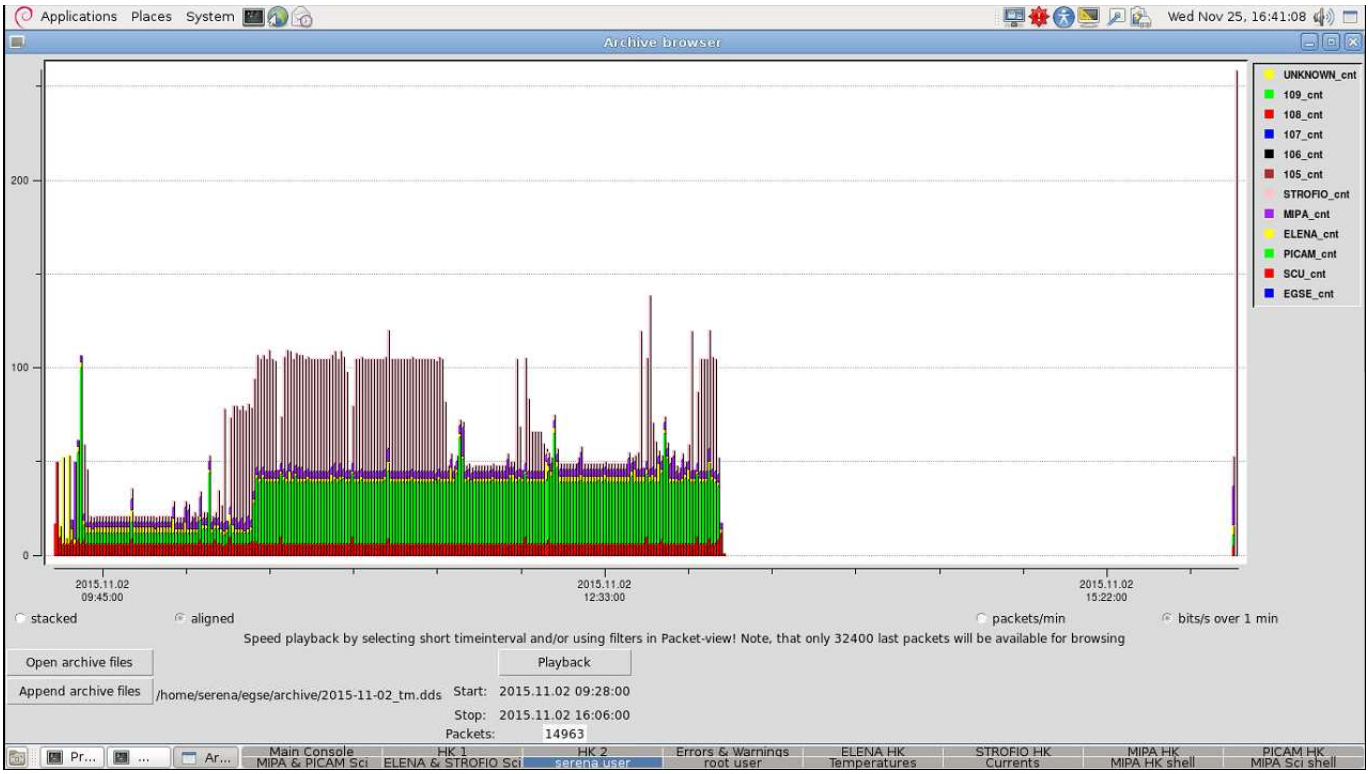


Fig. 19: SERENA HK Packets Distribution 2015-11-02

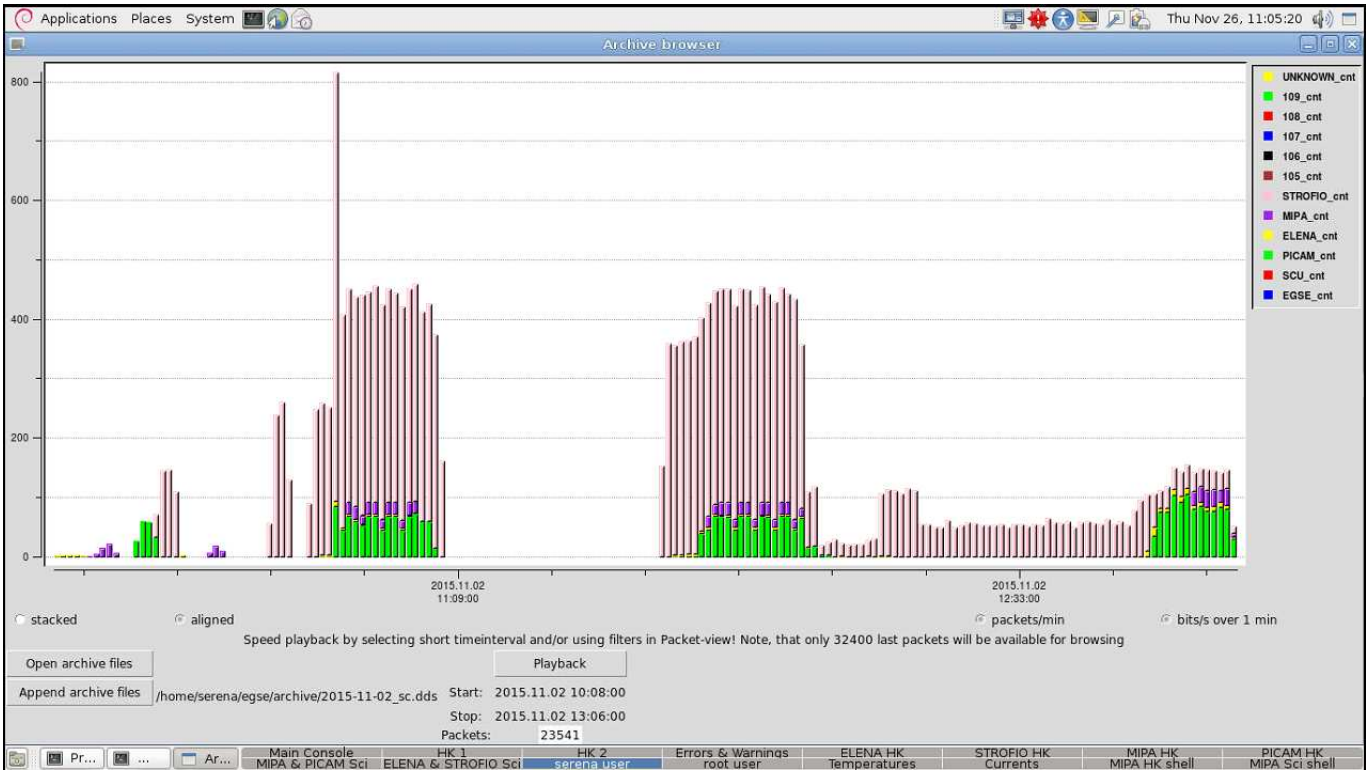


Fig. 20: SERENA Science Packets Distribution 2015-11-02

6.3 Details on the Received TM Packets

Here some of the received packets (but not all) are listed.

- EPOCH time and time synchronization was correct.
- Received TM(1,1) “SERE PC Command Accepted” as expected.
- Received TM(1,7) “SERE SCU TC Exec. Ack.” as expected.
- Received TM(1,7) “SERE MIPA TC Exec. Ack.” as expected.
- Received TM(1,7) “SERE PICAM TC Exec. Ack.” as expected.
- Received TM(1,7) “SERE ELENA TC Exec. Ack.” as expected.
- Received TM(1,7) “SERE STROFIO TC Exec. Ack.” as expected.

6.4 System Packets Summary

Received HK TM(3,25), all the data was as expected and TBW

6.5 Science Packets Summary

Received HK TM(21,3), all the data was as expected and TBW

7 Observed Susceptibilities and/or Anomalies

Here the relevant warnings and notable events noted monitoring the data of the SFT-FV 26/10 and 02/11 2015 in ESTEC loaded offline:

1. Some “error packet sequence check, PID 104, PCAT 12 Src/Dest ID 0 sequence error, 0 is not xxx” due to discontinuities in the STROFIO sequence counter.

2. Again a peak on the STROFIO current was detected at ~10:29 UTC on 2015-11-02: a short spike of current at 0.6 A was measured by the parameter “STROFIO Curr. Pr.” where the average value of the same parameter is ~ 0.1 A. The only event monitored nearly in the same period of time is the increasing of the values “STROFIO basic” (~10:22 and then on).

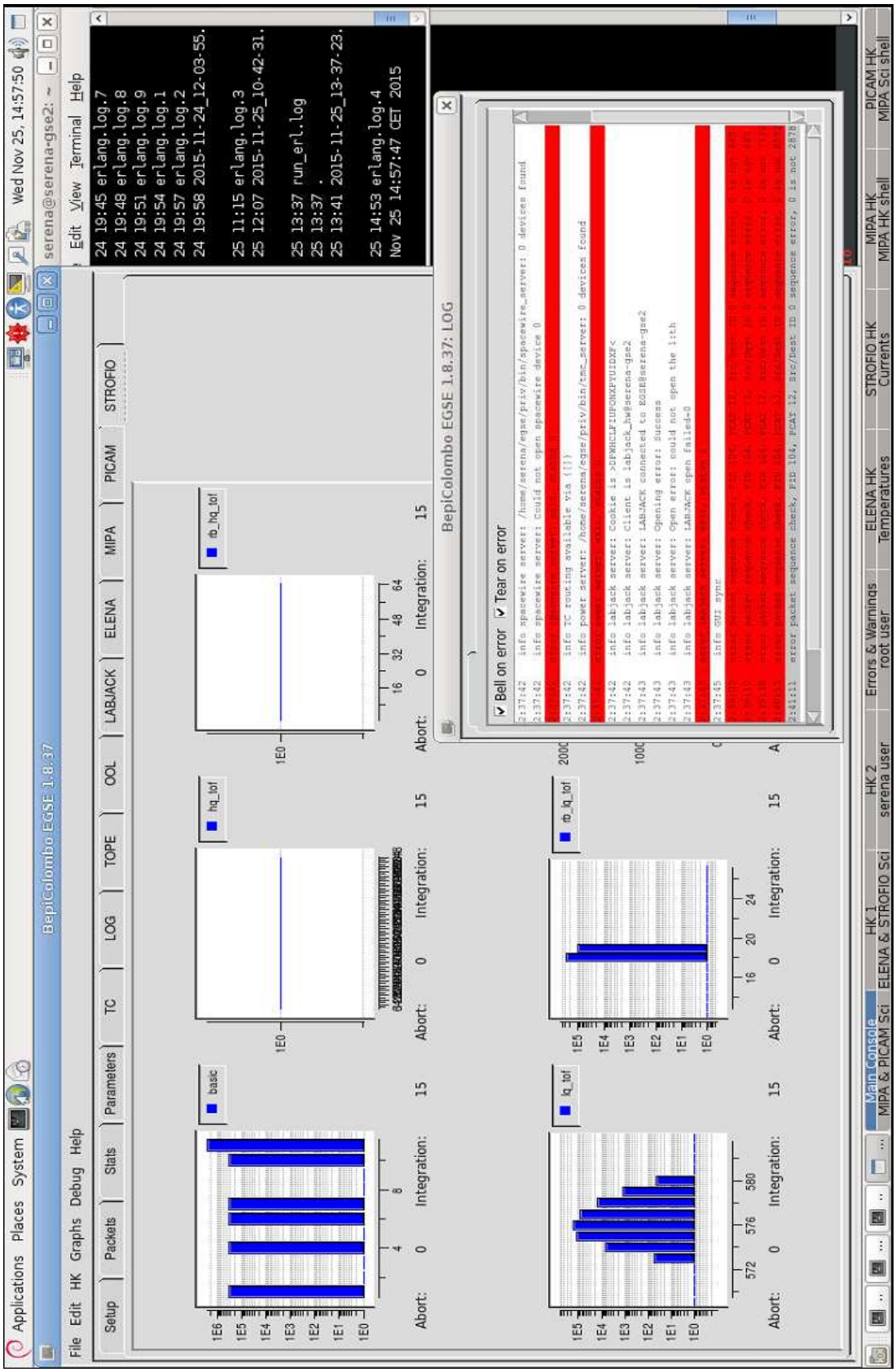
8 Conclusions

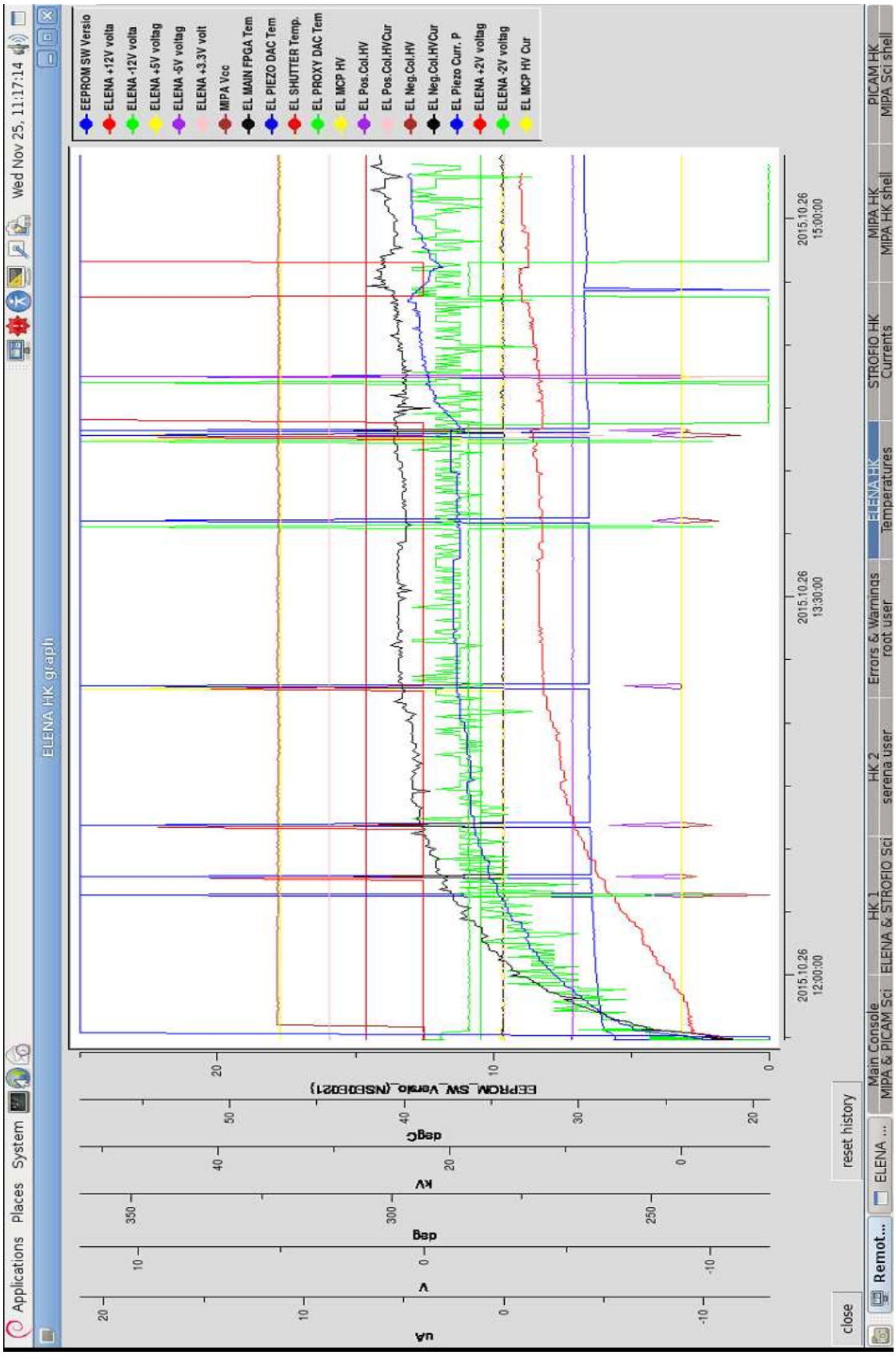
The goal to verify the SERENA nominal behaviour during SFT-FV tests was achieved. Both at SERENA package level and for all the subsystems the SERENA performance as a whole was nominal, with the exceptions of the few events described before in this report.

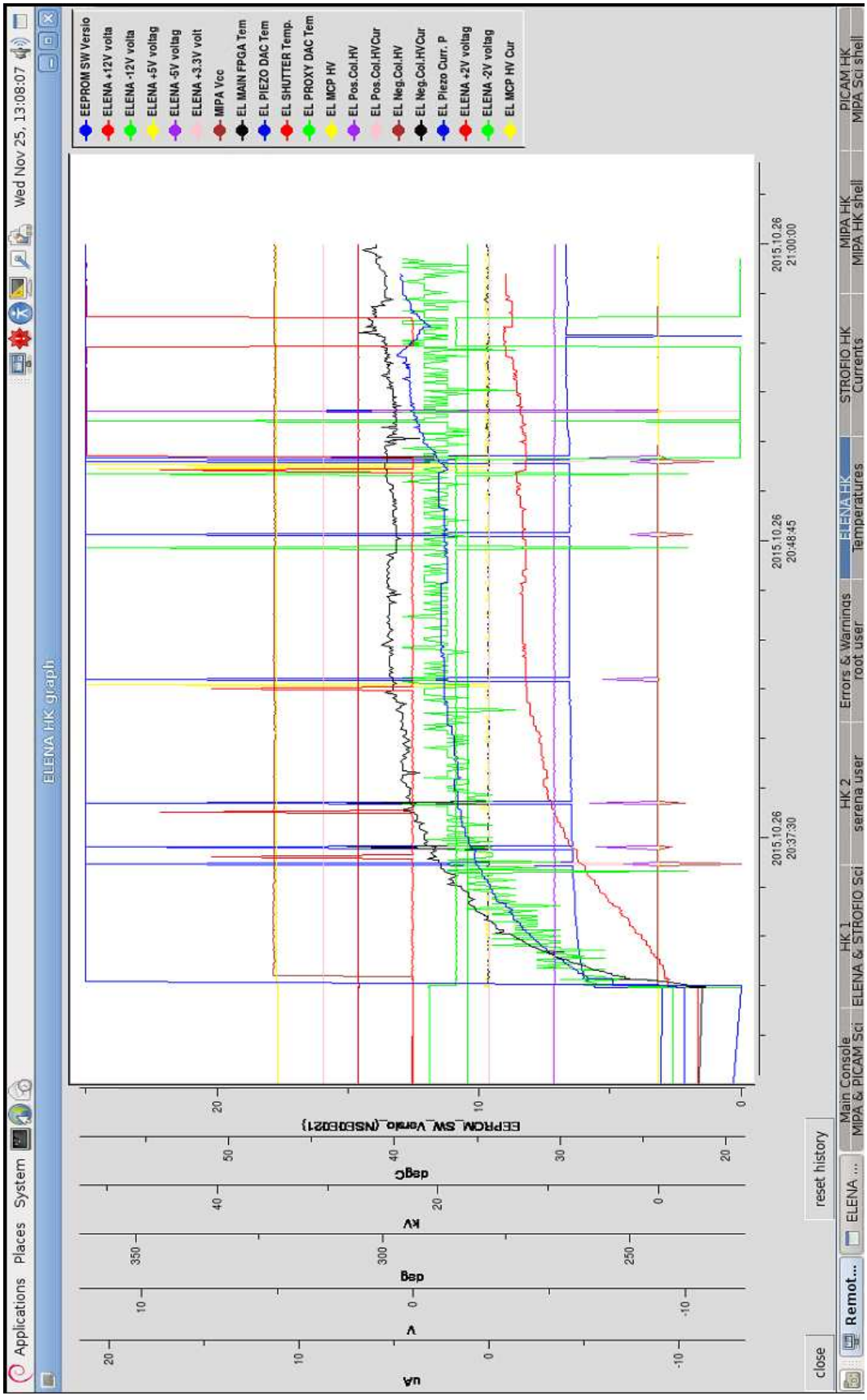
Test 1 Start Date: 2015-10-26 11:40, Test End Date: 2015-10-26 21:00 UTC

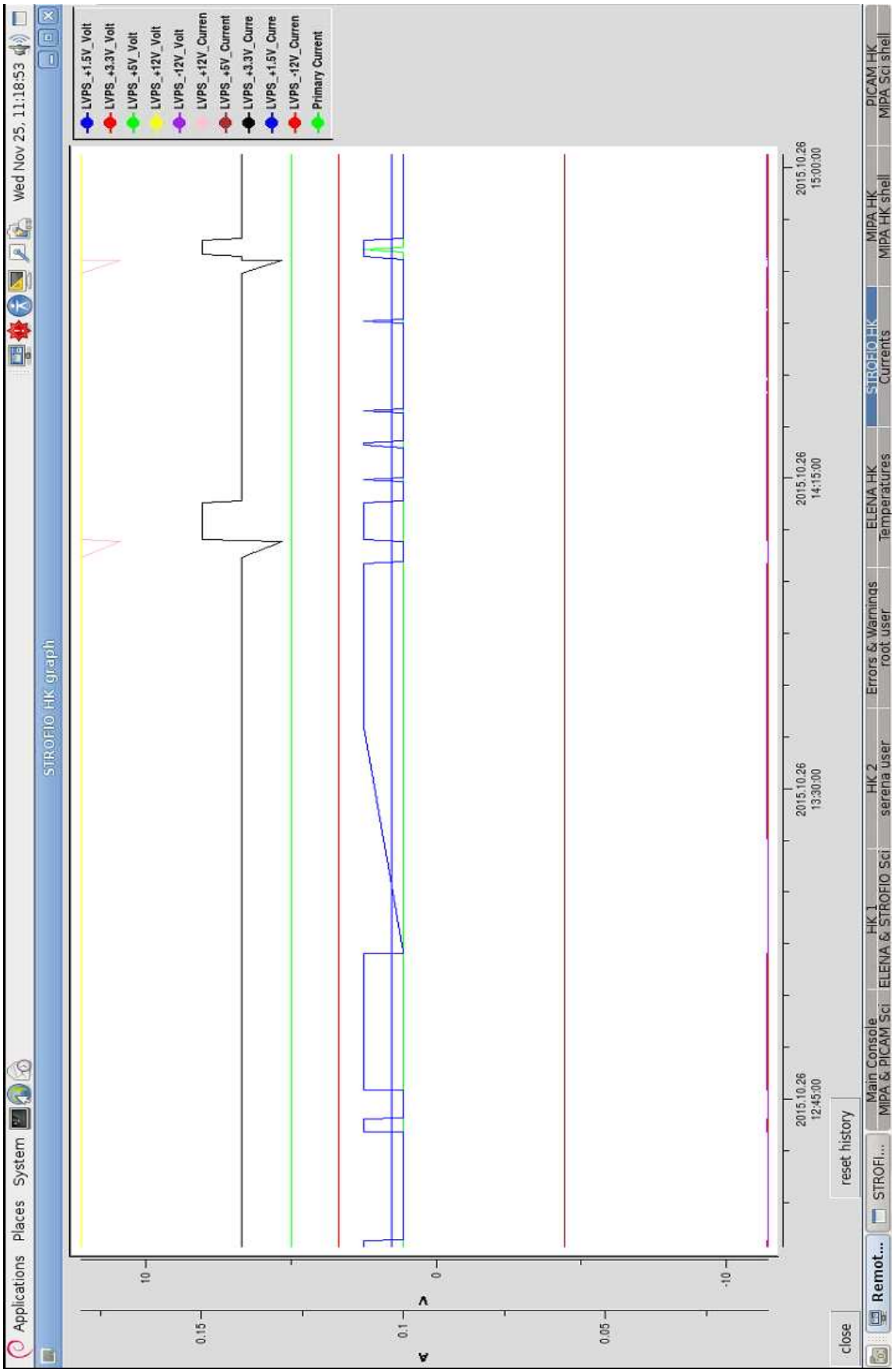
Test 2 Start Date: 2015-11-02 09:28, Test End Date: 2015-11-02 16:06 UTC

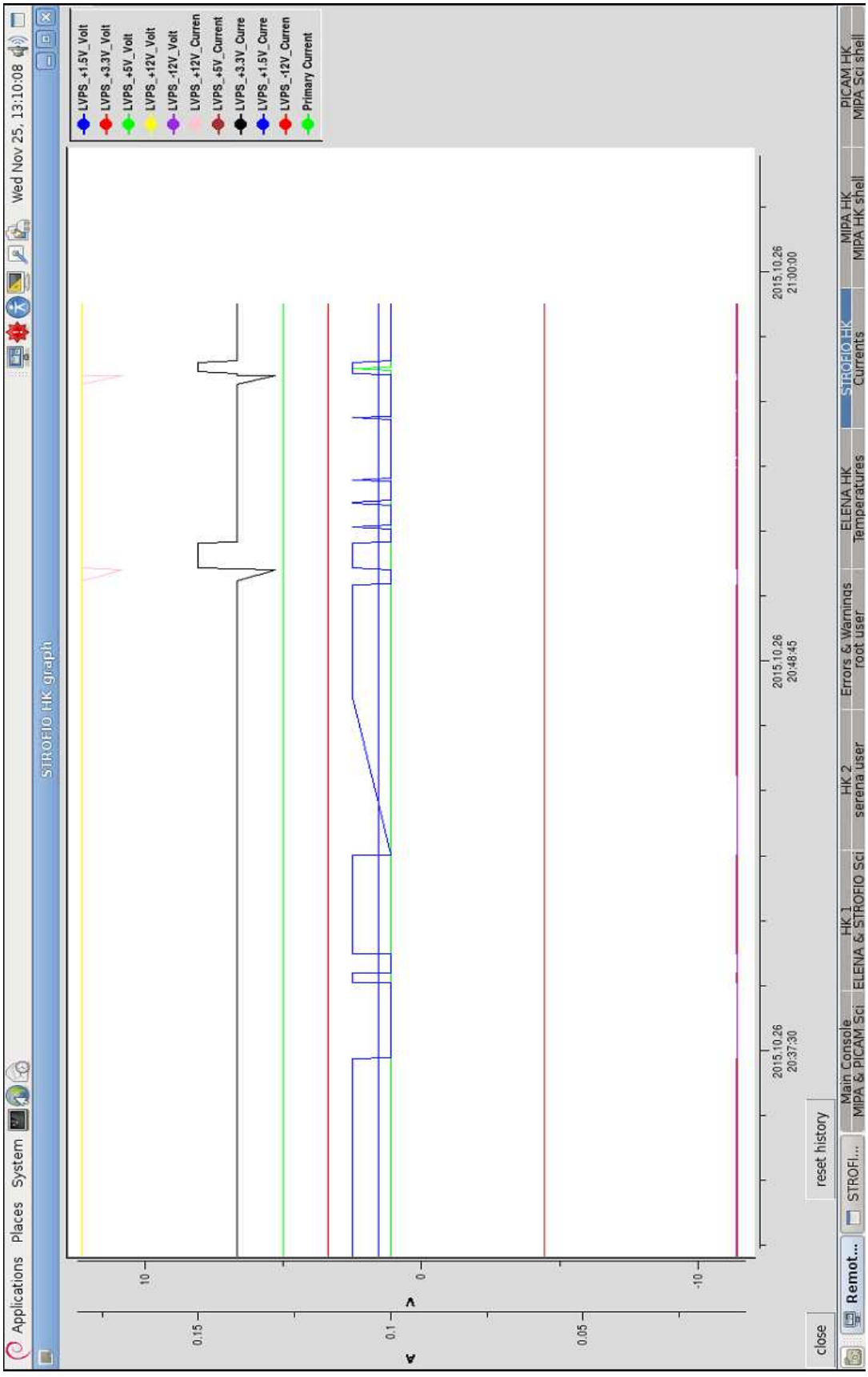
9 Appendix A Graphs Collection

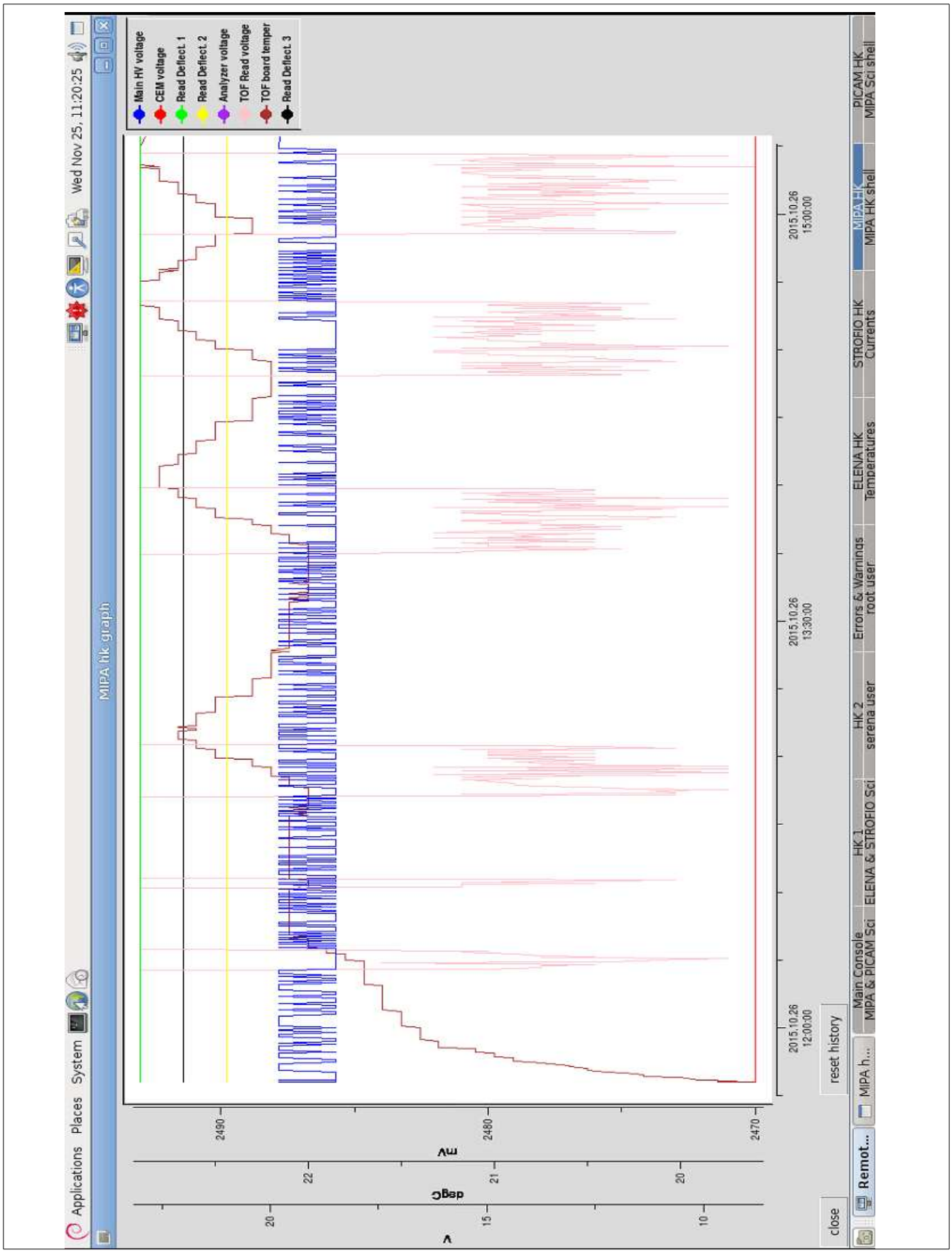

Applications Places System
Wed Nov 25, 14:57:50
serena@serena-gse2: ~
Edit View Terminal Help
24 19:45 erlang.log.7
24 19:48 erlang.log.8
24 19:51 erlang.log.9
24 19:54 erlang.log.1
24 19:57 erlang.log.2
24 19:58 2015-11-24_12-03-55.
25 11:15 erlang.log.3
25 12:07 2015-11-25_10-42-31.
25 13:37 run_erl.log
25 13:37 .
25 13:41 2015-11-25_13-37-23.
25 14:53 erlang.log.4
Nov 25 14:57:47 CET 2015
BepiColombo EGSE 1.8.37
File Edit HK Graphs Debug Help
Setup
Packets
Stats
Parameters
TC
LOG
TOPE
OOL
LABJACK
ELENA
MIPA
PICAM
STROFIO
BepiColombo EGSE 1.8.37: LOG
Bell on error
Tear on error
Main Console
HK 1
HK 2
Errors & Warnings
ELENA HK
STROFIO HK
MIPA HK
PICAM HK
MIPA & PICAM Sci
ELENA & STROFIO Sci
serena user
root user
Temperatures
Currents
MIPA HK shell
MIPA Sci shell

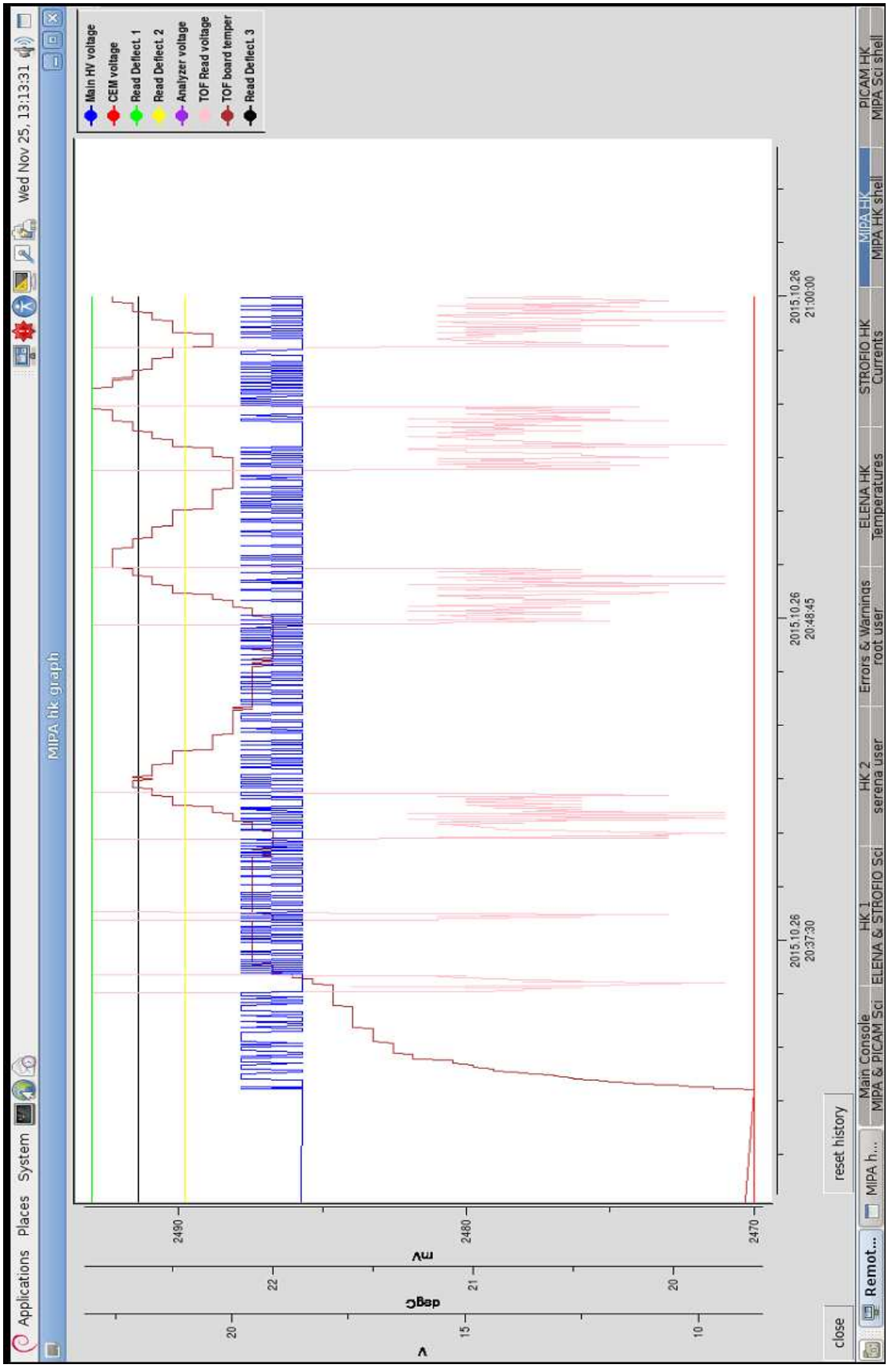

ELENA HK graph
Wed Nov 25, 11:17:14
EEPROM SW Versio
ELENA +12V volta
ELENA -12V volta
ELENA +5V voltag
ELENA -5V voltag
ELENA +3.3V volt
MIPA Vcc
EL MAIN FPGA Tem
EL PIEZO DAC Tem
EL SHUTTER Temp.
EL PROXY DAC Tem
EL MCP HV
EL Pos.Col.HV
EL Pos.Col.HV/Cur
EL Neg.Col.HV
EL Neg.Col.HV/Cur
EL Piezo Curr. P
ELENA +2V voltag
ELENA -2V voltag
EL MCP HV Cur
2015.10.26 15:00:00
2015.10.26 13:30:00
2015.10.26 12:00:00
EEPROM_SW_Versio_(NSE0E021)
degC
kV
deg
V
uA
reset history
close
Applications
Places
System
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
HK 1
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell
ELENA ...
Remot...

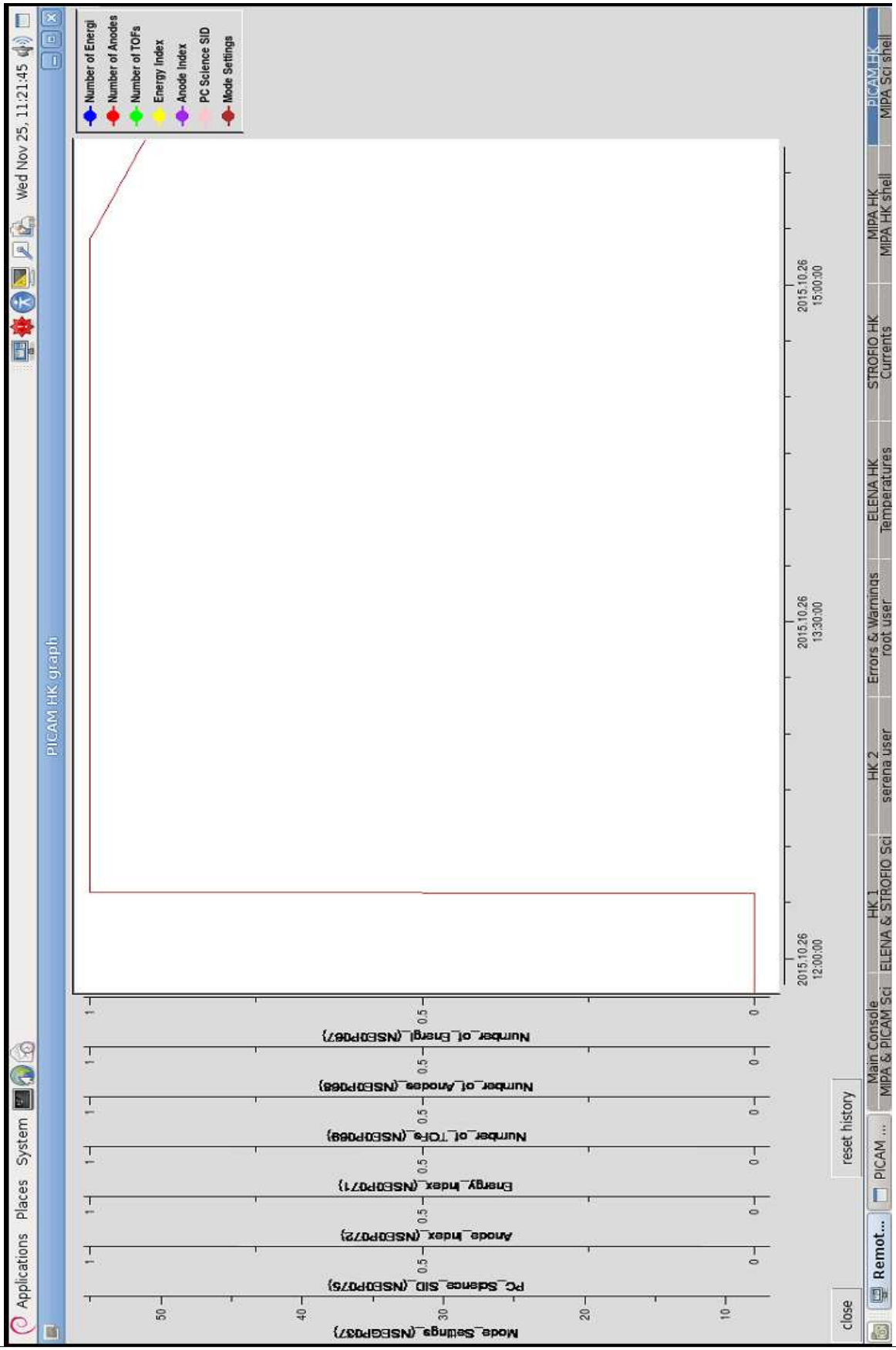

ELENA HK graph
Wed Nov 25, 13:08:07
Applications Places System
EEPROM SW Versio
ELENA +12V volta
ELENA -12V volta
ELENA +5V voltag
ELENA -5V voltag
ELENA +3.3V volt
MIPA Vcc
EL MAIN FPGA Tem
EL PIEZO DAC Tem
EL SHUTTER Temp.
EL PROXY DAC Tem
EL MCP HV
EL Pos.Col.HV
EL Pos.Col.HVCur
EL Neg.Col.HV
EL Neg.Col.HVCur
EL Piezo Curr. P
ELENA +2V voltag
ELENA -2V voltag
EL MCP HV Cur
2015.10.26 21:00:00
2015.10.26 20:48:45
2015.10.26 20:37:30
EEPROM_SW_Versio_(NSEH021)
degC
kV
deg
V
uA
reset history
close
Main Console MIPA & PICAM Sci
ELENA ... HK 1 ELENA & STROFIO Sci
HK 2 serena user
Errors & Warnings root user
ELENA HK Temperatures
STROFIO HK Currents
MIPA HK MIPA HK shell
PICAM HK MIPA Sci shell
Remot...

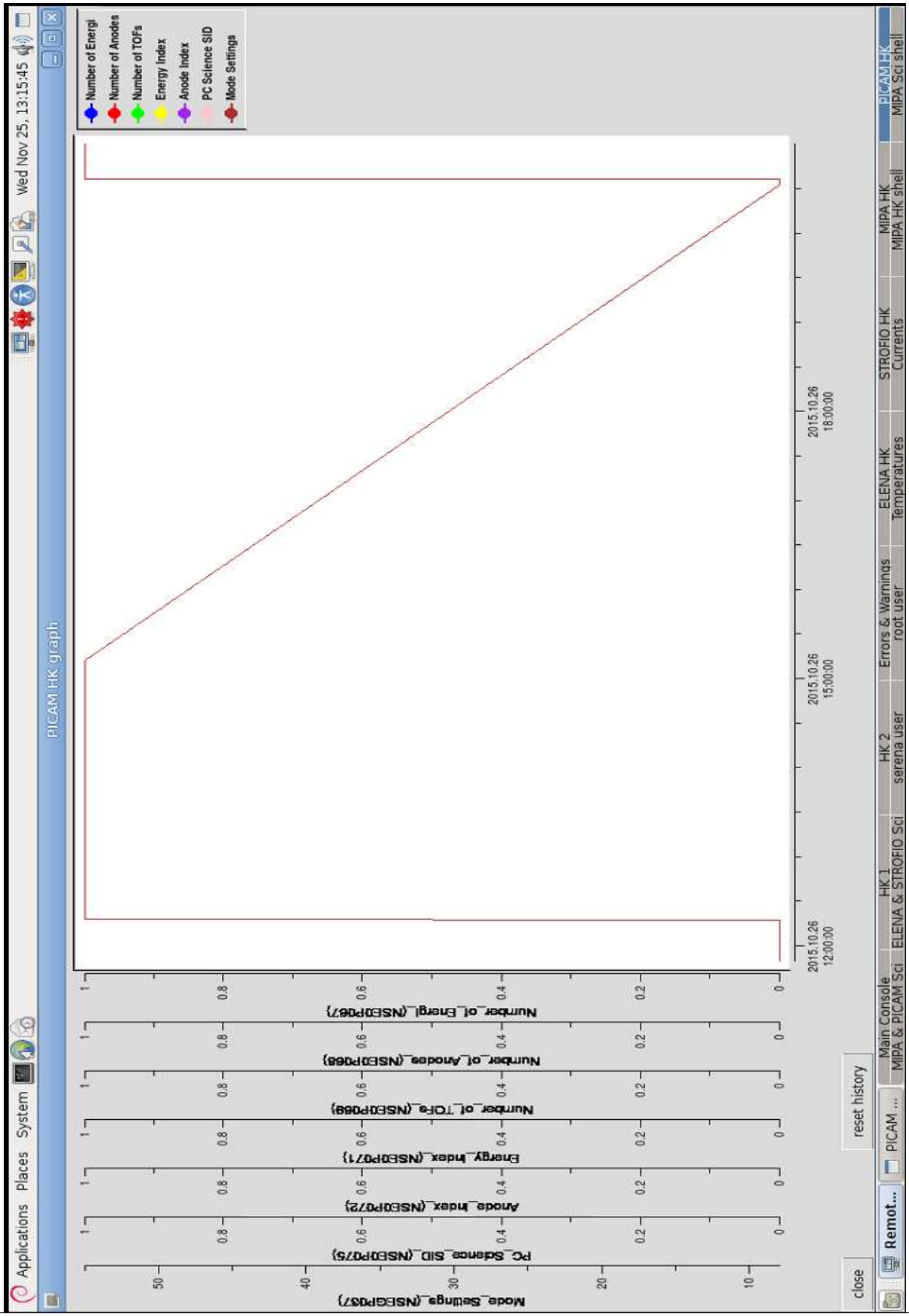

Applications Places System
Wed Nov 25, 11:18:53
STROFIO HK graph
LVPS_+1.5V_Volt
LVPS_+3.3V_Volt
LVPS_+5V_Volt
LVPS_+12V_Volt
LVPS_-12V_Volt
LVPS_+12V_Curren
LVPS_+5V_Current
LVPS_+3.3V_Curre
LVPS_+1.5V_Curre
LVPS_-12V_Curren
Primary Current
2015.10.26 12:45:00
2015.10.26 13:30:00
2015.10.26 14:15:00
2015.10.26 15:00:00
V
A
close
reset history
Remot...
STROFI...
Main Console MIPA & PICAM Sci
HK 1 ELENA & STROFIO Sci
HK 2 serena user
Errors & Warnings root user
ELENA HK Temperatures
STROFIO HK Currents
MIPA HK MIPA HK shell
PICAM HK MIPA Sci shell

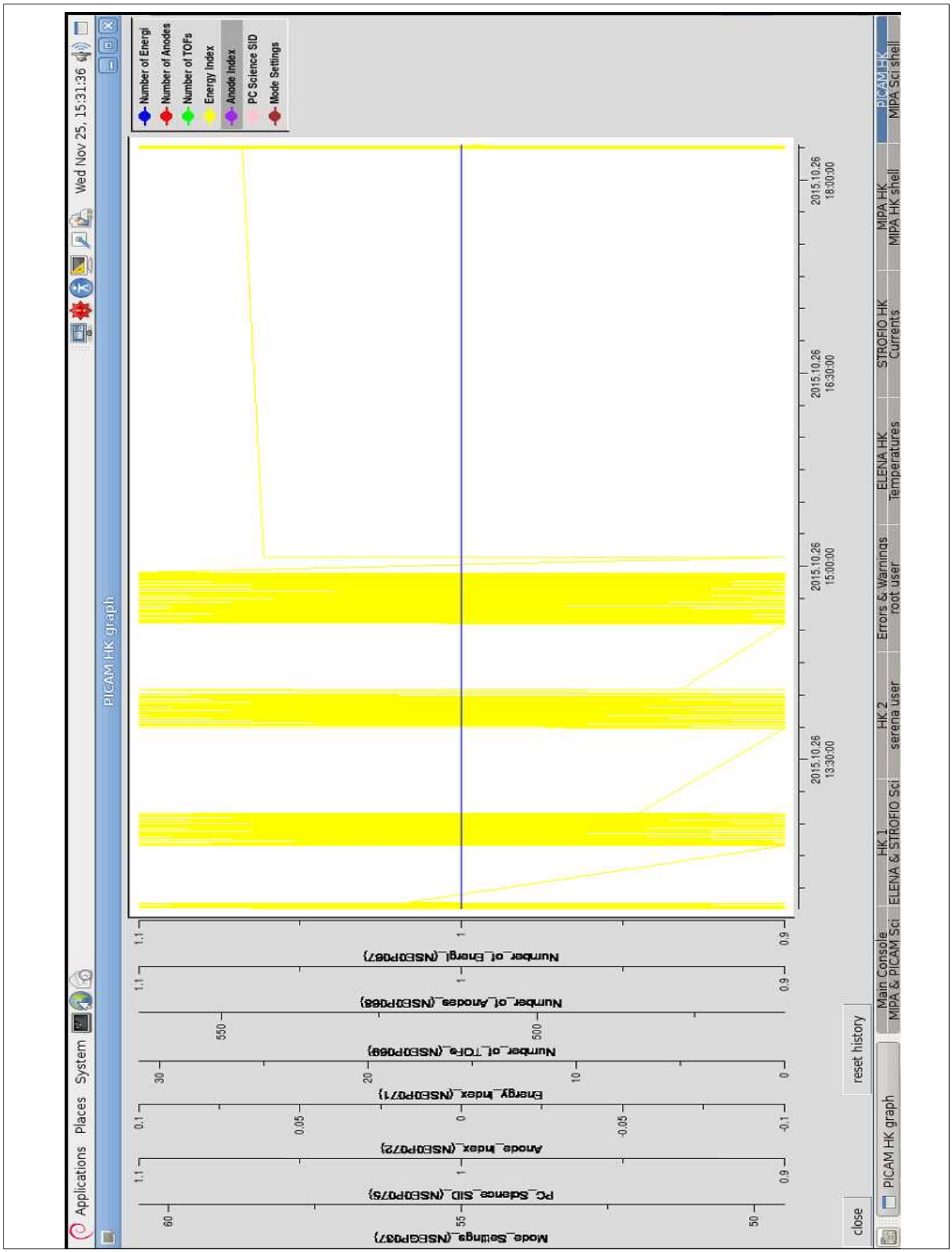

LVPS_+1.5V_Volt
LVPS_+3.3V_Volt
LVPS_+5V_Volt
LVPS_+12V_Volt
LVPS_-12V_Volt
LVPS_+12V_Curren
LVPS_+5V_Current
LVPS_+3.3V_Curre
LVPS_+1.5V_Curre
LVPS_-12V_Curren
Primary Current
Wed Nov 25, 13:10:08
STROFIO HK graph
Applications
Places
System
2015.10.26 20:37:30
2015.10.26 20:48:45
2015.10.26 21:00:00
reset history
close
Main Console MIPA & PICAM Sci
HK 1 ELENA & STROFIO Sci
HK 2 serena user
Errors & Warnings root user
ELENA HK Temperaturas
STROFIO HK Currents
MIPA HK MIPA HK shell
PICAM HK MIPA Sci shell
STROFI...
Remot...
A
V

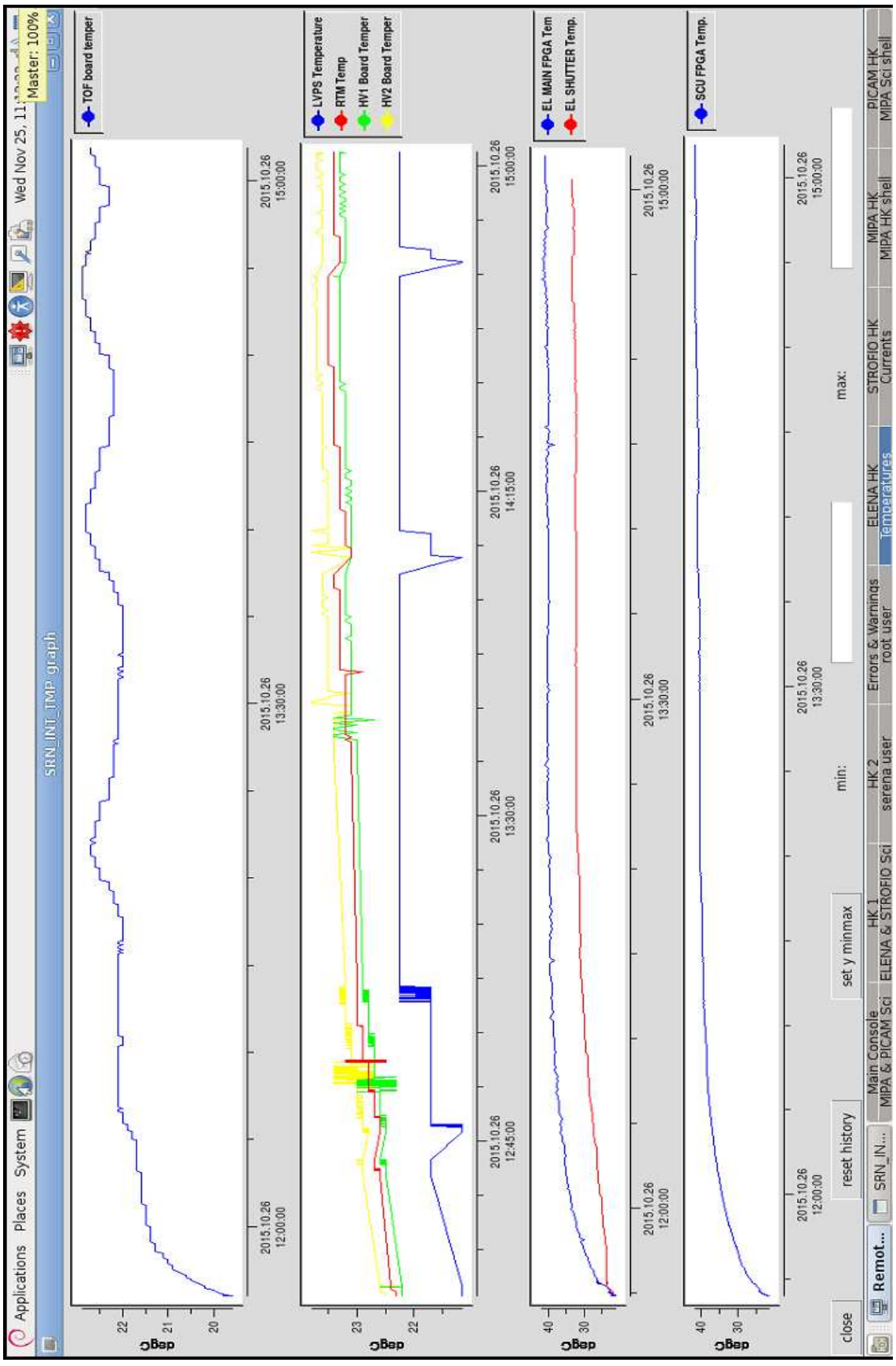

Applications
Places
System
Wed Nov 25, 11:20:25
MIPA hk graph
Main HV voltage
CEM voltage
Read Deflect. 1
Read Deflect. 2
Analyzer voltage
TOF Read voltage
TOF board temper
Read Deflect. 3
2015.10.26 12:00:00
2015.10.26 13:30:00
2015.10.26 15:00:00
mV
degC
V
reset history
close
Remot...
MIPA h...
Main Console MIPA & PICAM Sci
HK 1 ELENA & STROFIO Sci
HK 2 serena user
Errors & Warnings root user
ELENA HK Temperatures
STROFIO HK Currents
MIPA HK MIPA HK shell
PICAM HK MIPA Sci shell

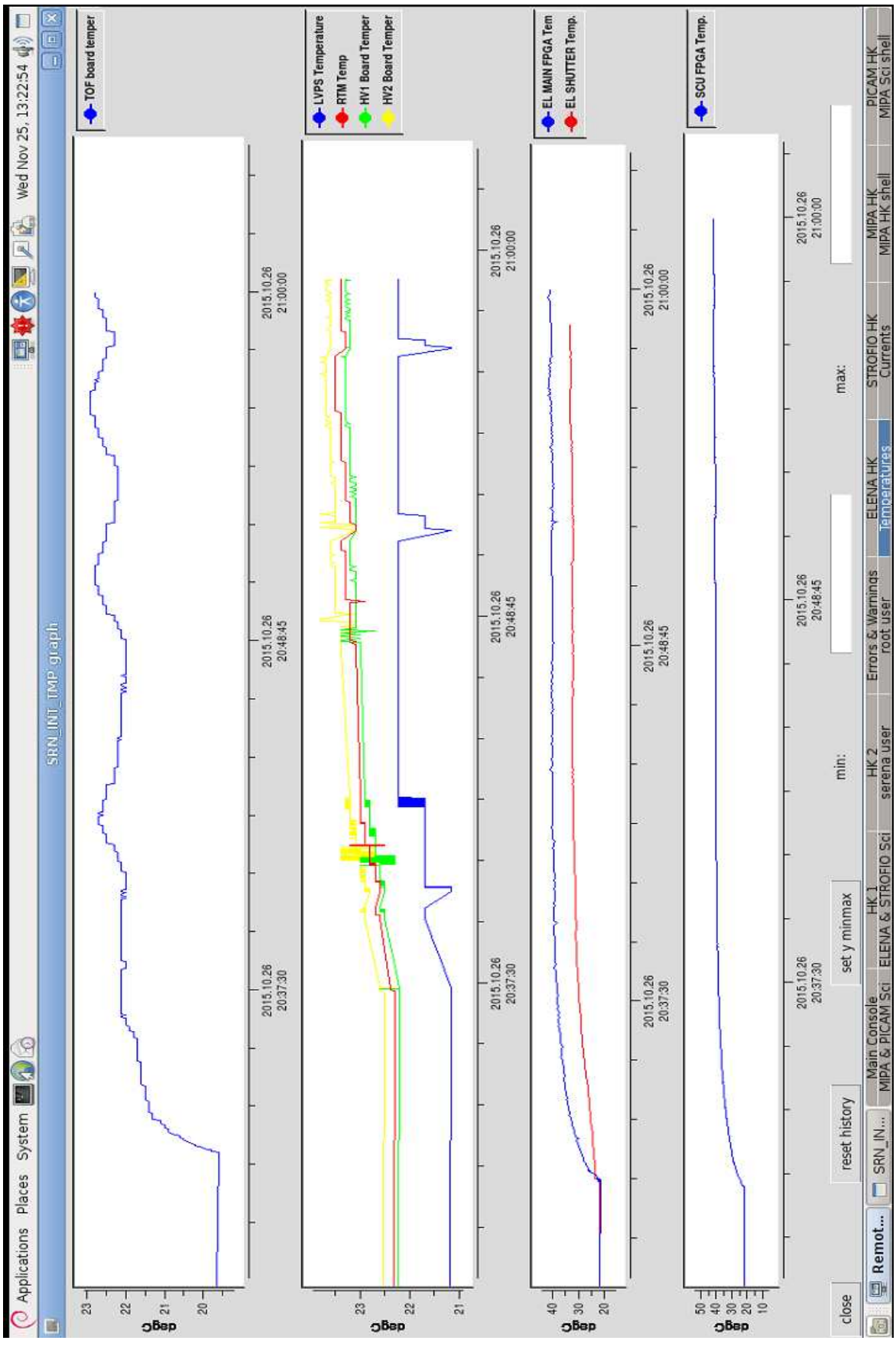

Main HV voltage
CEM voltage
Read Deflect. 1
Read Deflect. 2
Analyzer voltage
TOF Read voltage
TOF board temper
Read Deflect. 3
MIPA hk graph
2015.10.26 21:00:00
2015.10.26 20:48:45
2015.10.26 20:37:30
2490
2480
2470
mV
22
21
20
degC
20
15
10
V
reset history
close
Applications Places System
Wed Nov 25, 13:13:31
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
HK 1
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell
MIPA h...
Remot...

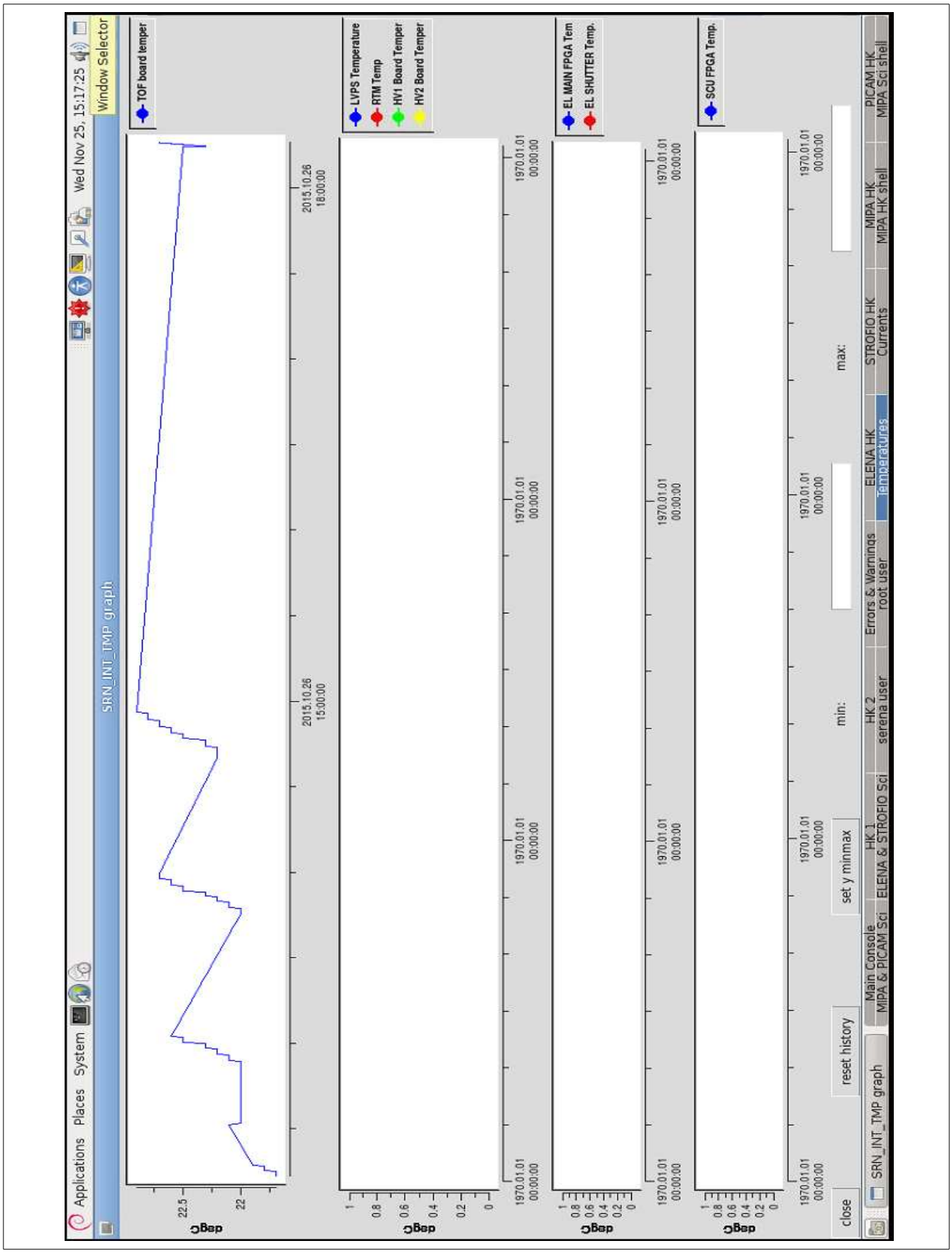

Wed Nov 25, 11:21:45
Applications Places System
PICAM HK graph
Number of Energi
Number of Anodes
Number of TOFs
Energy Index
Anode Index
PC Science SID
Mode Settings
2015.10.26 12:00:00
2015.10.26 13:30:00
2015.10.26 15:00:00
Mode_Settings_(NSEGP037)
PC_Science_SID_(NSEGP075)
Anode_Index_(NSEGP072)
Energy_Index_(NSEGP071)
Number_of_TOFs_(NSEGP069)
Number_of_Anodes_(NSEGP068)
Number_of_Energi_(NSEGP067)
reset history
close
Main Console
MIPA & PICAM Sci
HK 1
ELENA & STROFIO Sci
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell
Remot...
PICAM ...

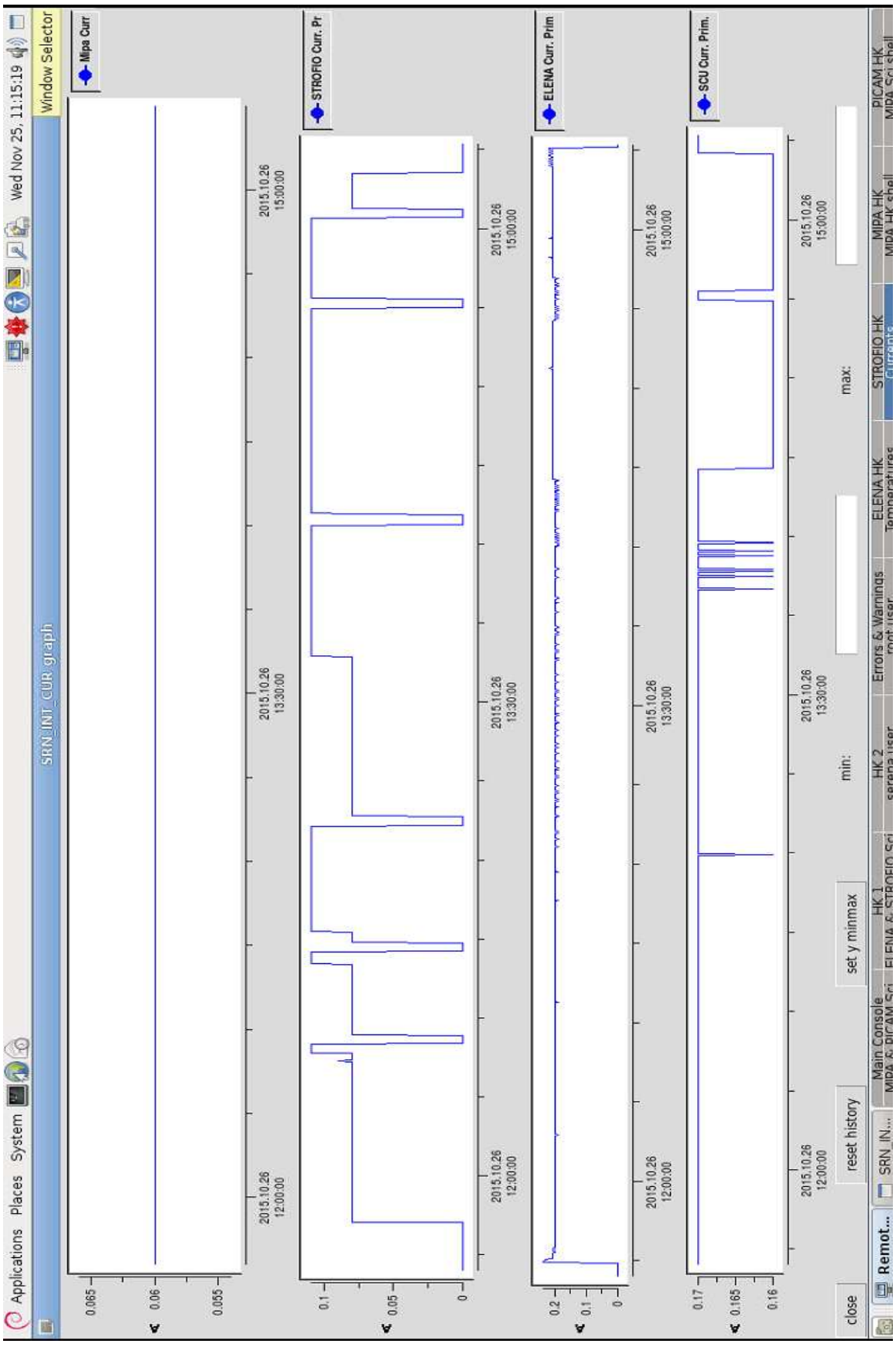

Number of Energi
Number of Anodes
Number of TOFs
Energy Index
Anode Index
PC Science SID
Mode Settings
PICAM HK graph
Wed Nov 25, 13:15:45
Applications
Places
System
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
HK 1
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
MIPA Sci shell
PICAM HK
2015.10.26 12:00:00
2015.10.26 15:00:00
2015.10.26 18:00:00
Mode_Settings_(NSEOP037)
PC_Science_SID_(NSEOP075)
Anode_Index_(NSEOP072)
Energy_Index_(NSEOP071)
Number_of_TOFs_(NSEOP069)
Number_of_Anodes_(NSEOP068)
Number_of_Energi_(NSEOP067)
reset history
close
PICAM ...
Remot...

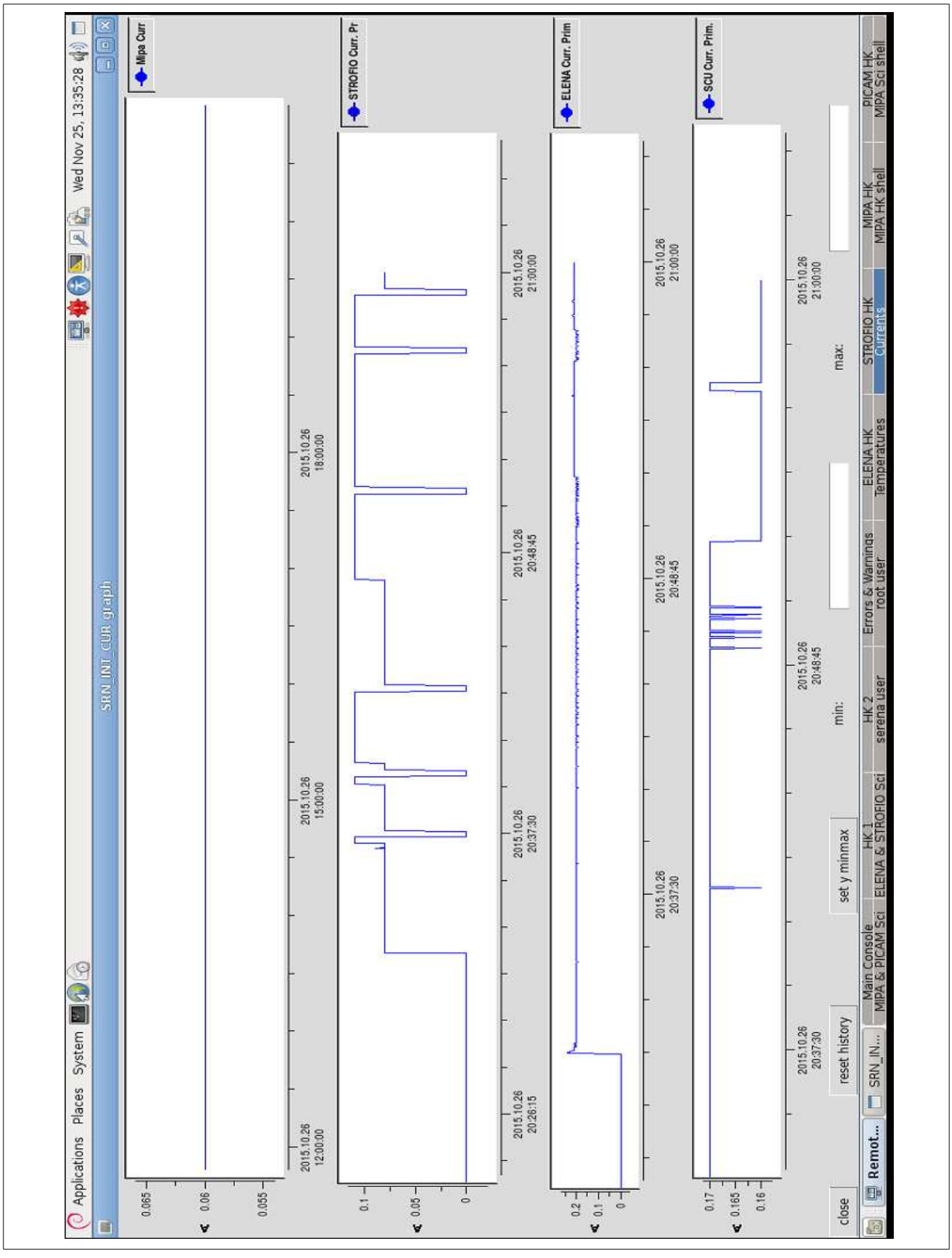

Number of Energi
Number of Anodes
Number of TOFs
Energy Index
Anode Index
PC Science SID
Mode Settings
Wed Nov 25, 15:31:36
PICAM HK graph
2015.10.26 13:30:00
2015.10.26 15:30:00
2015.10.26 16:30:00
2015.10.26 18:30:00
Number_of_Energi_(NSEOP067)
Number_of_Anodes_(NSEOP068)
Number_of_TOFs_(NSEOP069)
Energy_Index_(NSEOP071)
Anode_Index_(NSEOP072)
PC_Science_SID_(NSEOP075)
Mode_Settings_(NSEGP037)
reset history
close
Applications
Places
System
Main Console
MIPA & PICAM Sci
HK 1
ELENA & STROFIO Sci
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell
PICAM HK graph

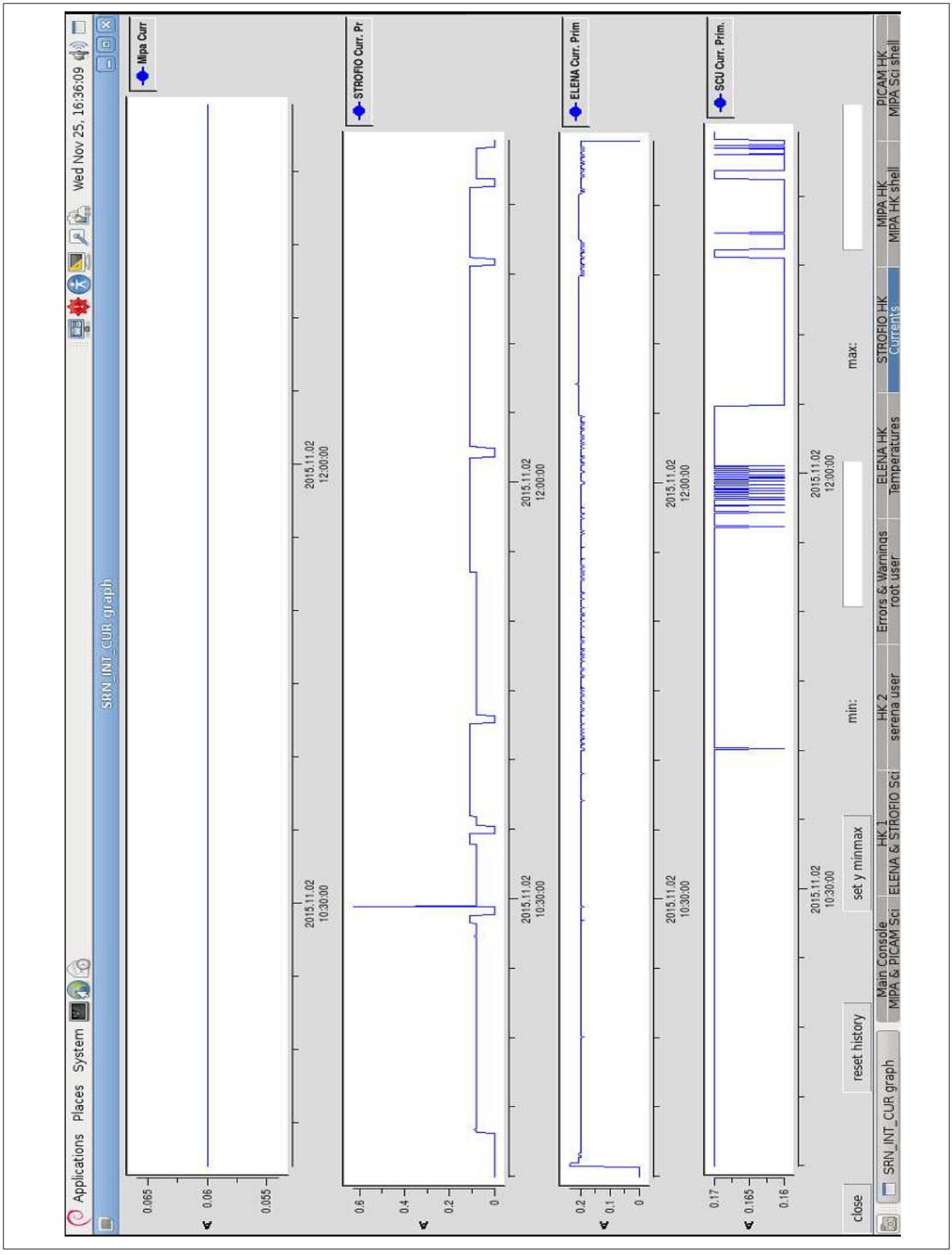

Applications Places System
Wed Nov 25, 11:
Master: 100%
SRN_INT_TMP graph
TOF board temper
LVPS Temperature
RTM Temp
HV1 Board Temper
HV2 Board Temper
EL MAIN FPGA Tem
EL SHUTTER Temp.
SCU FPGA Temp.
deg C
2015.10.26 12:00:00
2015.10.26 12:45:00
2015.10.26 13:30:00
2015.10.26 14:15:00
2015.10.26 15:00:00
min:
max:
set y minmax
reset history
close
Remot...
SRN_IN...
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
HK 1
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell

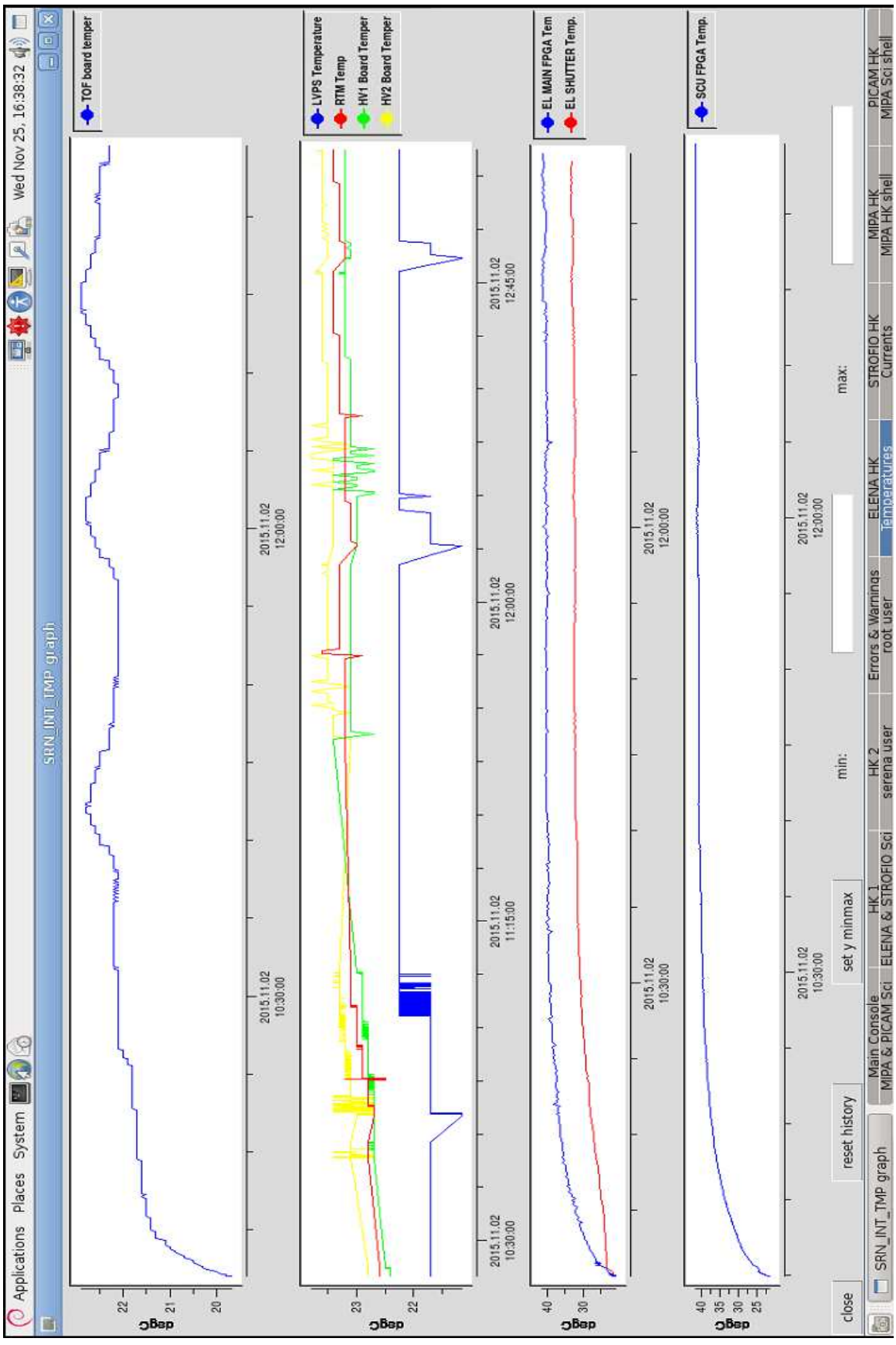

Applications Places System
Wed Nov 25, 13:22:54
SRN_INT_TMP_graph
TOF board temper
LVPS Temperature
RTM Temp
HV1 Board Temper
HV2 Board Temper
EL MAIN FPGA Tem
EL SHUTTER Temp.
SCU FPGA Temp.
deg C
2015.10.26 20:37:30
2015.10.26 20:48:45
2015.10.26 21:00:00
min:
max:
set y minmax
reset history
close
Remot...
SRN_IN...
Main Console
MIPA & PICAM Sci
HK 1
ELENA & STROFIO Sci
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell


Window Selector
Wed Nov 25, 15:17:25
Applications Places System
SRN_INT_TMP graph
TOF board temper
LVPS Temperature
RTM Temp
HV1 Board Temper
HV2 Board Temper
EL MAIN FPGA Tem
EL SHUTTER Temp.
SCU FPGA Temp.
deg C
2015.10.26 18:00:00
2015.10.26 15:00:00
1970.01.01 00:00:00
close
reset history
set y minmax
min:
max:
HK 1
HK 2
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell


Applications Places System
Wed Nov 25, 11:15:19
Window Selector
SRN_INT_CUR_graph
Mipa Curr
STROFIO Curr. Pr
ELENA Curr. Prim
SCU Curr. Prim.
2015.10.26 12:00:00
2015.10.26 13:30:00
2015.10.26 15:00:00
min:
max:
set y minmax
reset history
close
Main Console
HK 1
HK 2
Errors & Warnings
ELENA HK
STROFIO HK
MIPA HK
PICAM HK


Applications Places System
Wed Nov 25, 13:35:28
SRN_INT_CUR graph
Mipa Curr
STROFIO Curr. Pr
ELENA Curr. Prim
SCU Curr. Prim.
close
reset history
set y minmax
min:
max:
Main Console
MIPA & PICAM Sci
ELENA & STROFIO Sci
HK 1
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell


Applications Places System
Wed Nov 25, 16:36:09
SRN_INT_CUR graph
Mipa Curr
STROFIO Curr. Pr
ELENA Curr. Prim
SCU Curr. Prim.
2015.11.02 12:00:00
2015.11.02 10:30:00
close
reset history
set y minmax
min:
max:
SRN_INT_CUR graph
Main Console
MIPA & PICAM Sci
HK 1
ELENA & STROFIO Sci
HK 2
serena user
Errors & Warnings
root user
ELENA HK
Temperatures
STROFIO HK
Currents
MIPA HK
MIPA HK shell
PICAM HK
MIPA Sci shell



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