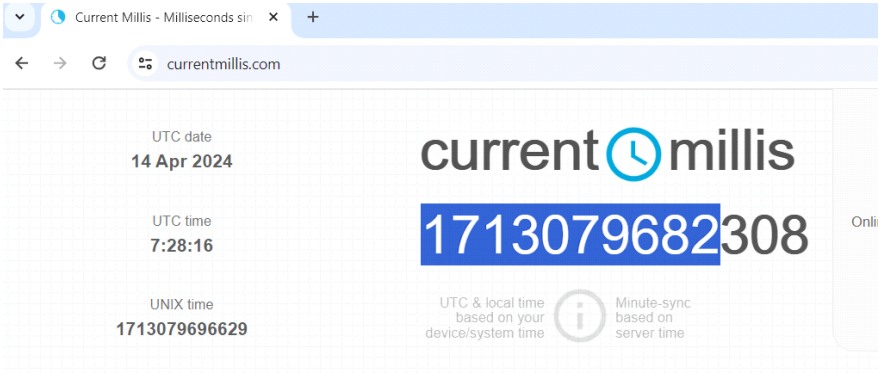
2024 FLIGHT

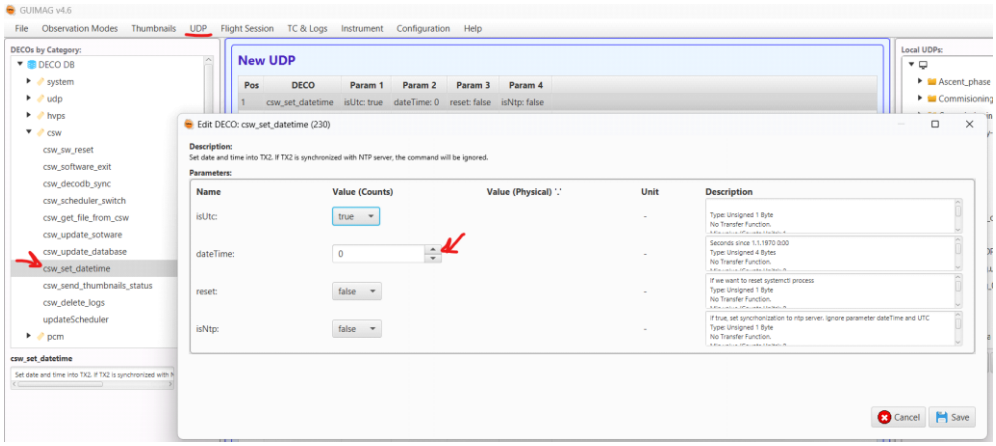
DO NOT MAKE

NOTE: In case that the date of the HK is not correct, we have to manually set the UTC time for the DPU. It is due to the time servers to which we are connected (provided by MPS) and it shall work properly in the flight. Each time that the instrument is electrically shut down, we have to do the following for the correct datetime:

- *In UDP tab, select the DECO: "csw_set_datetime"*
- *Search (internet) the current millis and copy the number (except the last 3 digits → we take just the seconds).*



- *Copy this number to the "datetime" parameter of the DECO, save and launch the UDP.*



- *Now we can see the HKs with the current datetime (UTC) in "Flight Session".*

09/04/24

- Expected Angel and Eduardo arrival at Kiruna

10/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón
- 08:30 – Daily briefing. Containers arrived on 09/04/24 and they are already in the Dome. Expected activities for today:
    - Hardware (MPS): Unpack and prepare the instruments near the telescope.
    - Optics: Telescope calibration (Achim).
    - SCIP and Tumag: Check and support the instrument works in the Dome. Functional test expected to be performed tomorrow (11/04/24). Connection directly with MPS switch.
    - IT (Dietmar and Tino): Test vpn with MPS
- 14:00 – Test connection to MPS IP range: 192.168.**145**.102 → OK
- 17:00 – Plug in the HV cable (Ángel). Just connection without tape.

- New range for IPs with vpn to MPS (Göttingen Operations Center):
    - Kiruna: 192.168.**144…**
    - Göttingen: 192.168.**145…**
    - The DDB is now **192.168.145.102**

11/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón
- 08:30 – Daily briefing. PFI already mounted in the top of the telescope. Expected activities for today:

    - Hardware (MPS): Finish the connections between telescope and E-Units
    - IT (Dietmar and Tino): Check the ICU once the connections are done. Check the Startlink communication if possible…
    - SCIP and Tumag: Check and support the instrument works in the Dome. Functional test expected to be performed after the ICU tests.
- 09:30 – Check the connections with SCIP and Tumag E-Units:
    - Ángel → Peque⇧o desperfecto en la carcasa del tope del pasamuros, no es importante ni afecta al rendimiento del conector pero ha tenido que tener un buen golpe porque falta parte del conector.
- 11:15 – ICU tests finished. Switch ON SCIP and TuMag
- 11:20 – Date manually changed from GUIMAG to UTC TIME!

From now on, the hour is in UTC (Start of functional tests).

Versions:

- Tumag E-Unit control SW: **2.4.4**
- AMHD FPGA firmware: **24.22**
- DPU FP FPGA: **framegrabber_fw_20220624_0x00211108_0x00220624**
- Cameras FPGA firmware: **2.0**
- GUIMag: **4.6**
- Database: **2.9.3**

Datetime not correct → Have to manually change in GUIMAG.

- 09:45 - Functional and electrical Test →OK.
- 11:00 - SCIP reports a problem with the bandwidth. They expected more bandwidth in the ICU. Solved by Tino by replacing their switch.
- *12:17 – Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - 13:03 – Code 31.
    - 13:15 – Connection lost with ICU. Reconnection at 14:47.
    - 15:20 – Code 31
    - ***SUMMARY: 2 errors in 1h30.***

- TEMP (17: 10 Hora local)

    HK (100) Optical Bench: 26.90 ºC

HK (6) SSD: 27.81 ºC

HK (92) Etalon: 35.01 ºC

HK (91) PMP: 35.02 ºC

HK (99) Cover 1: 26.87 ºC

HK (106) Cover 2: 28.22 ºC

12/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón
- 08:30 – Daily briefing. MPS will perform interferometer tests and they need us outside the DOME. The planning tests (temperatures and observing modes times) will be performed in the following days, during the weekend. Polarimetric tests planning:
    - Sunday → SUSI
    - Monday → SCIP
    - Tuesday → TuMag

13/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón
- 08:30 – Daily briefing. Yesterday MPS interferometer tests successfully. Polarimetric planning CHANGES → SCIP need a day for testing the new CSW and driver:
    - Sunday → SUSI
    - **Monday → TuMag**
    - **Tuesday → SCIP**
- 9:00 → TuMag and SCIP ON

Hours in UTC (TuMag):

- 7:02 → Problem with the ICU (both instruments SCIP and TuMag).
    - At first, not receiving HK → Solved by MPS (reconnect to DDB from GUIMAG and OK).
    - Cannot send TCs from GUISCIP/GUIMAG → DDB sends code ❽123❾ (not correct ACK) → MPS working on that⑤ Solved by MPS.

- 7:02 → Date changed manually by GUIMAG UDP.
- 7:20 → Science Mode in GUIMAG.
- 8:06 → *Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - NOTE: All systems ON → CWS, SUSI, SCIP, TUMAG, ICU
    - 11:38 → Test finished manually
    - *SUMMARY: 0 errors in 3h30.*

- 12:50 → Optic tests.
    - Configuration:
        - FW1 = F4
        - FW2 = 517.27 nm
        - V = -2800 V
    - Tests with first illumination inclination
        - Texp = 400 ms and 500 ms
            - Open
            - Darks
            - Grid
            - Random Dots
    - Tests with movement in illumination inclination by Achim
        - Texp = 200 ms, 300 ms, 400 ms and 500 ms
            - Open

Stored in Tumag external SSD → ❽Optic-Test❾

https://www.dropbox.com/scl/fi/2y002bnbzsazo6349ph5t/Optic-Test-Kiruna-13_04_24.rar?rlkey=21c1oyqgqb44zto4msumhwene HYPERLINK "https://www.dropbox.com/scl/fi/2y002bnbzsazo6349ph5t/Optic-Test-Kiruna-13_04_24.rar?rlkey=21c1oyqgqb44zto4msumhwene&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fi/2y002bnbzsazo6349ph5t/Optic-Test-Kiruna-13_04_24.rar?rlkey=21c1oyqgqb44zto4msumhwene&dl=0"dl=0

- 15:16 - *Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - 15:38 – Code 31.
    - 15:43 – Code 31.
    - 15:47 - Test finished manually.
    - *SUMMARY: 2 errors in 30min.*

14/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón
- 08:30 – No Daily briefing (Sunday). Today's activities:
    - SUSI → Polarimetric tests
    - SCIP and TuMag → Tests without MPS support.
- TuMag expected tests:
    - Temperatures monitorization (science)
    - Run observing modes prepared for timelines (from #37 to #42) → We change the number of repetitions from 5 to 2. Only for camera 1! NOTE: The "lambda_repeat" is set to 4 (in the excel "TIMES" it seems to be executed for "lambda_repeat" set to 1). Tests in external SSD "Imgs-ObservingModes-Timeline" folder:
        - Single modes (UTC):
            - 6:49 → #37 (Obs 1)
            - 6:59 → #38 (Obs 2.02)
            - 7:08 → #39 (Obs 2.06)
            - 7:15 → #40 (Obs 0s)
            - 7:21 → #41 (Obs 0p)
            - 7:27 → #42 (Obs 3.02)
            - 7:32 → #43 (Obs 3.06)
            - 7:36 → #44 (Obs 4)
            - 7:39 → #45 (Obs 5.02)
            - 7:41 → #46 (Obs 5.06)
        - Transitions → Folder structure created
    - Run HVPS test (code 31)

- 08:05 - *Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - *10:05* - Test finished manually.
    - *SUMMARY: 0 errors in 2h.*

15/04/24

- TuMag team in Kiruna: Ángel Tobaruela, Eduardo Bailón, Pablo Santamarina, Dani (INTA), Antonio (INTA).
- 08:30 – Daily briefing. Polarimetric planning CHANGES → SCIP need a day for testing the new CSW and driver:
    - Monday → SUSI (until 12:00). **Evening for TuMag Optic tests**
    - Tuesday → CWS (until 12:00). **Evening for TuMag Polarimetric tests**
    - Wednesday → SCIP polarimetric tests

- Error with csw versions in SCIP (launching multiple old instances of the csw…) → A. Sanchez propose a solution (grant privileges to new CSW version and delete the old ones). Testing by SCIP.
- Cannot connect to Kiruna network (192.168.**144**…) from the MPS network (connected through VPN from IAA → 192.168.**145**…). Ping tests to SCIP, TUMAG, and laptops in Kiruna do not response…
    - TUMAG: Need to change the gateway (default was 192.168.144.1):

      >> route -n → Check the gateway

      >> *route add -net 192.168.145.0/24 gw **192.168.144.2*** → *AFTER THAT, PING OK!*
    - SCIP: Need to change the gateway (default was 192.168.144.1):

      >> route -n → Check the gateway

      >> *route add -net 192.168.145.0/24 gw **192.168.144.2*** → *AFTER THAT, PING OK!*
    - Windows laptops:

      >> route print -4

      >> *route add 192.168.145.0 MASK 255.255.255.0 192.168.144.2* → NOT WORKING⑤ Maybe due to windows net configuration (cant even ping from the "144" subnet…)

- 07:12 - *Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - 07:55:25 – Code 31.
    - 07:55:58 – Code 31.
    - 07:57 – Code 31.

    - 10:05 - Test finished manually.
    - *SUMMARY: 3 errors in 3h.*
- Run UDPs for taking transition times between modes → Images to be analized by Pablo.
- 12:07 - *Start of HVPS tests (code 31). Run UDP: /TEST_ HVPS/15obs1p+202.udp*
    - *NOTE: SCIP not operating… SUSI vibration tests*
    - 12:21 – Code 31.
    - 12: 47- Test finished manually.
    - *SUMMARY: 1 errors in 40min.*
- 12:50 – Start of optical tests → 600 ms exposure time OK
    - Etalon motor move: (0 1)
        - 800 CCW → Stop in **754 steps** (1 0)
        - 695 CW → (0 1). Position 0 (incidencia normal)
        - 60 CW → (0 1)
        - FLIGHT POSITION!
    - Scan voltage in each filter
    - Take images with targets…
    - 14:10 - DOME door open in the middle of the tests!!

30/04/24

- TuMag team in Kiruna: -
- Functional tests in gondola – Controlling from IAA (via GOC)

Hour is in UTC (Start of functional tests).

Versions:

- Tumag E-Unit control SW: **2.4.4**
- AMHD FPGA firmware: **24.22**
- DPU FP FPGA: **framegrabber_fw_20220624_0x00211108_0x00220624**
- Cameras FPGA firmware: **2.0**
- GUIMag: **4.6**
- Database: **2.9.3**

Datetime not correct → Have to manually change in GUIMAG.

- 12:00 - Functional and electrical Test → OK.

06/05/24

- TuMag team in GOC: David O. José Miguel
- SCIP and SUSI are off
- David O. share a document how to connect to a PC in Kiruna that tumag team has access to storage data up to 7,5 TB
    - https://www.dropbox.com/work/Solar%20Physics%20Group/SUNRISE%20III%20TUMAG/Flight%202024?preview=README_KIRUNA_COMPUTER_ACCESS.rtf
- 13:40 Gottingen local time: switch on Tumag
- 14:20 Gottingen local time: creation of new monitoring plots
    - Running commissioning-UDPS
        - Photon_flux
        - Photon_flux_MgCore_1acc
    - We observe that the thumbnail reception is not ok. We receive only thumbnails of camera 1 and one of camera 2.
    - When we run the second time the udp, only two thumbnails are received and the crop is not correct
- 17:31Gottingen local time: switch off Tumag
- Logs stored in https://www.dropbox.com/scl/fo/k7m55mcvxpa3xtpb61enu/AHwILqhA2wC5Pip3XVwXVsY?rlkey=y7p5lv0ft6ti49i6er29j93q1 HYPERLINK "https://www.dropbox.com/scl/fo/k7m55mcvxpa3xtpb61enu/AHwILqhA2wC5Pip3XVwXVsY?rlkey=y7p5lv0ft6ti49i6er29j93q1&st=x442zq77&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/k7m55mcvxpa3xtpb61enu/AHwILqhA2wC5Pip3XVwXVsY?rlkey=y7p5lv0ft6ti49i6er29j93q1&st=x442zq77&dl=0"st=x442zq77 HYPERLINK "https://www.dropbox.com/scl/fo/k7m55mcvxpa3xtpb61enu/AHwILqhA2wC5Pip3XVwXVsY?rlkey=y7p5lv0ft6ti49i6er29j93q1&st=x442zq77&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/k7m55mcvxpa3xtpb61enu/AHwILqhA2wC5Pip3XVwXVsY?rlkey=y7p5lv0ft6ti49i6er29j93q1&st=x442zq77&dl=0"dl=0

07/05/24

- TuMag team in GOC: David O. José Miguel

- SCIP and SUSI are off
- NTP server for PC in GOC updated by José Miguel following the steps showed into the video https://www.youtube.com/watch?v=Fj_KvIYoESo
    - We set the time by order
        - 192.168.144.51
        - 192.168.144.100
        - 192.168.144.2
- We have been talkinig with Antonio S. regarding the problems due to the reception of the Thumbnails. We only receive data from camera 1 because csw is prepared to generate only thumbnails for camera 1.
- 09:25 Gottingen local time: switch on Tumag
- Modifications in Commisioning_UDP and Commissioning_NO_LOS folder of Guimag to create thumbnails only for camera 1 (before it was set to both cameras).
- All the thumbnails arrived.
- 14:12 Gottingen local time: start hvps test for code 31. It run for 1,5 hr without problems. At 15:32 we received 1 code 31 and ten minutes after the same error.
- 15:55 Gottingen local time: HVPS test finished.
- 16:00 GOC local time: Tumag switch off
- Data of the day is stored in: https://www.dropbox.com/scl/fo/n9273rxv36xk4wzm3c46g/AMA6D3tnUMdPtBnMHU_GhC0?rlkey=l17c38cbmj32iabje3zoz8laa HYPERLINK "https://www.dropbox.com/scl/fo/n9273rxv36xk4wzm3c46g/AMA6D3tnUMdPtBnMHU_GhC0?rlkey=l17c38cbmj32iabje3zoz8laa&st=7fpfck5b&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/n9273rxv36xk4wzm3c46g/AMA6D3tnUMdPtBnMHU_GhC0?rlkey=l17c38cbmj32iabje3zoz8laa&st=7fpfck5b&dl=0"st=7fpfck5b HYPERLINK "https://www.dropbox.com/scl/fo/n9273rxv36xk4wzm3c46g/AMA6D3tnUMdPtBnMHU_GhC0?rlkey=l17c38cbmj32iabje3zoz8laa&st=7fpfck5b&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/n9273rxv36xk4wzm3c46g/AMA6D3tnUMdPtBnMHU_GhC0?rlkey=l17c38cbmj32iabje3zoz8laa&st=7fpfck5b&dl=0"dl=0

08/05/24

- TuMag team in GOC: David O. José Miguel
- SCIP is on and SUSI is off
- 14:41 GOC local time: Tumag on

    - Run observing modes 1+2_02 to check the numbers of 31 and the problem in images that appears when the error is produced. It was discovered by Pablo and David
    - Test start at 12:54 UTC
        - 4 error with code 31 produced
    - Test end at 14:36 UTC
    - Switch off tumag at 18:00 GOC local time
- Guimag session stored in: https://www.dropbox.com/scl/fo/bzrywc9u4r0eu3nff0hj1/AAEI8QJXGWAbWXUVSidjLoY?rlkey=krs24ept5d1e43h2fjp98jthq HYPERLINK "https://www.dropbox.com/scl/fo/bzrywc9u4r0eu3nff0hj1/AAEI8QJXGWAbWXUVSidjLoY?rlkey=krs24ept5d1e43h2fjp98jthq&st=jemlubro&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/bzrywc9u4r0eu3nff0hj1/AAEI8QJXGWAbWXUVSidjLoY?rlkey=krs24ept5d1e43h2fjp98jthq&st=jemlubro&dl=0"st=jemlubro HYPERLINK "https://www.dropbox.com/scl/fo/bzrywc9u4r0eu3nff0hj1/AAEI8QJXGWAbWXUVSidjLoY?rlkey=krs24ept5d1e43h2fjp98jthq&st=jemlubro&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/bzrywc9u4r0eu3nff0hj1/AAEI8QJXGWAbWXUVSidjLoY?rlkey=krs24ept5d1e43h2fjp98jthq&st=jemlubro&dl=0"dl=0

09/05/24

- TuMag team in GOC: David O. José Miguel
- SCIP and SUSI are off
- 09:21 UTC: Tumag on
    - Analysing data we have discovered that some images received on 08/05/24 by camera 0 were corrupted. Antonio created a contigency to solve the problem if the problem appear during the flight.
    - Also we discovered differences in image timestamp and timestamp_start in the image header. This is due to a late synchronization of the dates and timeseed in the FG. Also Antonio creates a contigency to solve the problem.
    - The new contigencies are stored in: new-contingencies-2024 - HYPERLINK "https://docs.google.com/document/d/1bxaBTWSjzgHai025FykBZr27nVwQhCXSGoxUjB7KYHQ/edit?invite=CNLE160P"Documentos HYPERLINK "https://docs.google.com/document/d/1bxaBTWSjzgHai025FykBZr27nVwQhCXSGoxUjB7KYHQ/edit?invite=CNLE160P" de Google
- 14:26 UTC: Tumag off

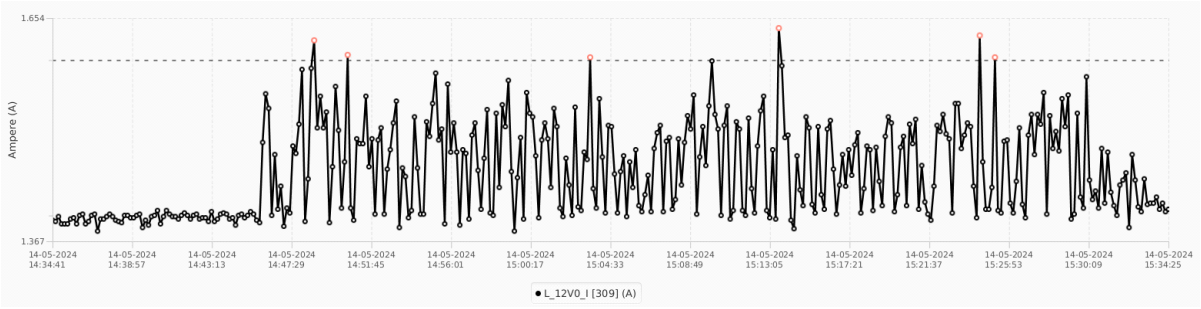
- Guimag session stored in: https://www.dropbox.com/scl/fo/35tb6bllct1p433m4a19q/AE4v-rYDoGpG2ji6qOJAPhE?rlkey=5xl1hlnbhf7da78pntnk3e1rh HYPERLINK "https://www.dropbox.com/scl/fo/35tb6bllct1p433m4a19q/AE4v-rYDoGpG2ji6qOJAPhE?rlkey=5xl1hlnbhf7da78pntnk3e1rh&st=fnaf3hgu&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/35tb6bllct1p433m4a19q/AE4v-rYDoGpG2ji6qOJAPhE?rlkey=5xl1hlnbhf7da78pntnk3e1rh&st=fnaf3hgu&dl=0"st=fnaf3hgu HYPERLINK "https://www.dropbox.com/scl/fo/35tb6bllct1p433m4a19q/AE4v-rYDoGpG2ji6qOJAPhE?rlkey=5xl1hlnbhf7da78pntnk3e1rh&st=fnaf3hgu&dl=0"& HYPERLINK "https://www.dropbox.com/scl/fo/35tb6bllct1p433m4a19q/AE4v-rYDoGpG2ji6qOJAPhE?rlkey=5xl1hlnbhf7da78pntnk3e1rh&st=fnaf3hgu&dl=0"dl=0

13/05/24

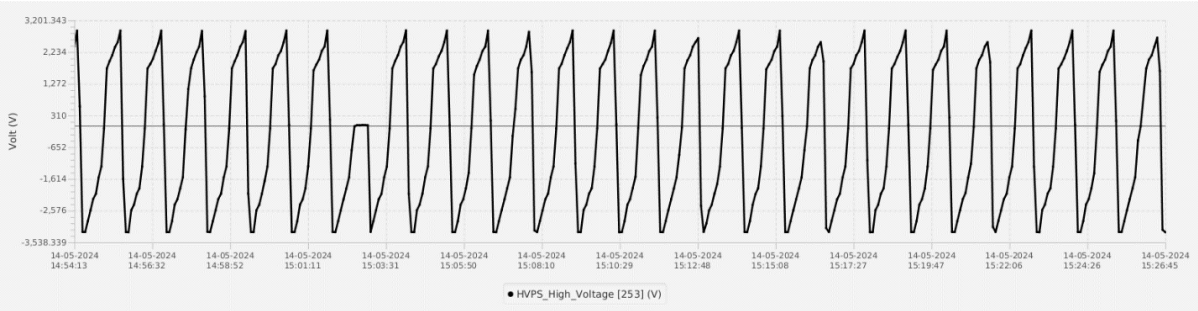
- TuMag team at GOC: Antonio SG, Pablo, Jose Carlos
- Meeting with David by Zoom to set the week tasks and schedule.
- System EGSE's training session for Dani and Jose Carlos.
- Besides a general review of most procedures, observation modes, and commissioning UDPs, a trial of the longitudinal mode calibration UDP has been carried out.
    - In UDPs long_mode_cal_LCVR2_2186 y 4723, we have changed thumbnail configuration from binning to cropping (64 x 64) on the image center.
    - We have repeated the two UDPs and an error has been found during the second pair. Antonio suspects that it's an error induced by the ICU that cannot manage the thumbnail's traffic. It declines receiving thumbnails.
    - Antonio's tentative suggestion of separating the two UDPs does not always work. We think there's no problem insofar we carefully check the results right after the UDPs have run. Whenever some thumbnails are missing, we must decide whether to repeat the observation.
    - A bug has also been found because the use of the so-called test mode for getting the images. This mode has not been properly checked and, indeed, it produces wrong headers. A change to calibration mode has been carried out. Additionally, instead of using LCVR_Set_Voltage, we now use fg_set_lcvr_volt_list UDP. In the end, new UDPs have been written: long_mode_cal_lcvr2_2186(4723)_perobien.udp.
- A new version of CSW has been written by Antonio to deal with some synchronization problem with the NTP servers.

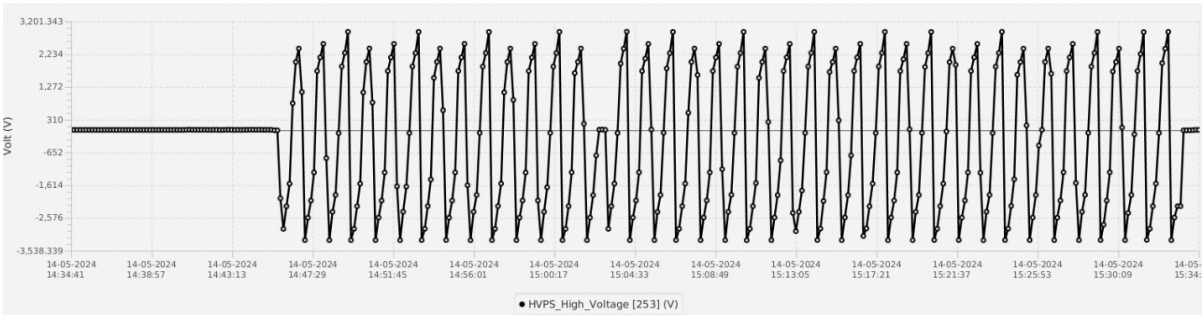
14/05/24

- TuMag team at GOC: Antonio SG, Pablo, and Jose Carlos
- TuMag team at Kiruna: Ángel, and Edu
- Zoom with David and Dani.
- CSW update by Antonio in the real instrument after yesterday's tests in Granada model.
- Trial of the QSDC_HC timeline with sunlight.
    - Description of 55.cs and 25.cs are missing in Gitlab.
    - According to Julián (thank you, Julián, for the explanation), polarimetric calibrations in this timeline are not correct yet. Voltages for LCVRs are set to zero. We therefore must make sure that the proper UDPs are included.
    - It seems that a problem in the execution of one of the cs procedures in the timeline has failed. Nevertheless, it might be that our list of commands in QSDC_HC timeline is not updated. We are going to check later.
- Trial of the new longitudinal polarization calibration. Some editing of the exposure time has been necessary to adapt the procedure to the available (laser) light.
- Edu and Ángel have updated the frame grabber firmware.
- Ángel has wrapped (vulcanized first) the HV connectors with Kapton.
- Functional tests successfully passed after the above operations to the system.
- 15obs1p+202.udp run in order to check the behavior of the HVPS.
    - A few occurrences found of current excess of L_12V0_I (HK 309).



    - First #31 error at 15:02:40 UTC (17 min approx. after execution starting point).
    - No more errors after half an hour from that one.





15/05/24

- TuMag team at GOC: Antonio SG, Pablo, and Jose Carlos
- The update of CSW have fixed an undesired synchronization effect due to the different behavior of the three seeds for timestamps.
- Trial of Obs_302 and Obs_4 (longitudinal modulation) for checking the update of the F/W.
- Antonio has found a bug that explains the unusual behavior of yesterday's procedure on QSDC_HC.
- Pablo has prepared a program to properly isolate the images of the various micropolarizers in order to get them ready for analyzing the longitudinal calibration data.
- QSDC_HC has been repeated just for us and everything was fine this time. The bugs were properly detected and corrected.

16/05/24

- TuMag team at GOC: Antonio SG, Pablo, and Jose Carlos.
- Antonio has been debugging/polishing some code, partly in combination with José Miguel (in Granada).
- Pablo has been writing programs to display average spectral profiles for the lines after full scans due for calibration in flight. The results after using the programs with data gathered on 1 May with the real system are fine.
- These results have been stored in the Dropbox's calibration_material folder.
- Antonio is creating UDPs corresponding to the 35 and 55 timeline commands, to have them prepared in case it's necessary to run them separately.

17/05/24

- TuMag team at GOC: Antonio SG, Pablo, and Jose Carlos.
- We have been switched on at 08:39 UTC.
- The gondola starts moving at 08:40 UTC.
- From 08:46 on, power consumption has stabilized.
- Science mode on at 09:26.
- While on, we have been monitoring the system and realized that the camera heater temperatures have been increasing to much higher values than their setpoints. After discussing with David, we have concluded that this temperature rise obeys to the regular dissipation through the cameras of the heat generated in the system. In fact, the cover 2 heater has been heating for long and it seems to be the root cause for the camera heater temperatures increase. As soon as the cover 2 heater has started to modulate around its setpoint, the camera heater temperatures increase rate has significantly decreased.
- As soon as they moved the telescope and the Sun hit differently the instrument, the camera heater temperatures started to raise again.
- We have switched off the cameras and their power and the temperatures (case lids) have started to decrease.
- Antonio and Jose Carlos leave GOC at 14:00. José Miguel and David take over.
- From 13:59 UTC to 14:01 UTC no TMs received due to disconnection of Sunrise from all networks

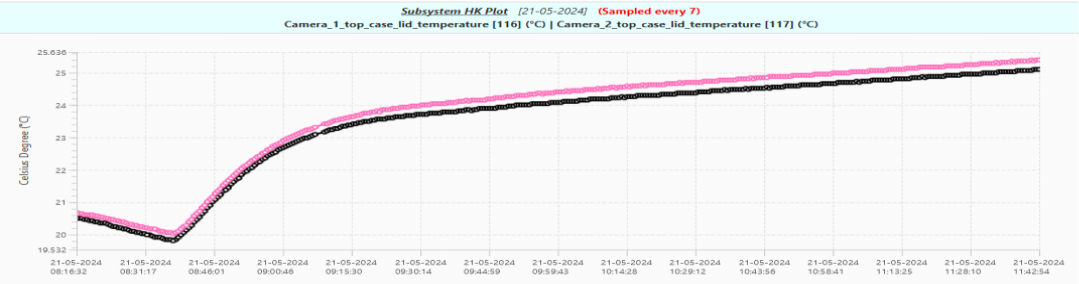
- 15:38UTC cams on. We ran some test modes with 5 images per cam to check that we receive single thumbnails. After that we send UDP TM_Rate_Test.udp (15:49:06 UTC). This UDP ran a lot of calibration modes to check that thumbnails are working properly and check the HVPS with a couple of modes 1+2.02. Everything worked smoothly. No errors received.
- 16:02:38 UTC ran again TM_Rate_Test.udp. At 16:03 UTC we received error code 99 from Camera 2. We performed a power-cycle of the cameras and start again with the same UDP. After a couple of minutes from the GOC asked us to abort the observation mode and go to safe mode because the tests finished.
- 16:10 UTC safe mode and 16:12 UTC power off the instrument.
- TODO task: Download the log of csw next time TuMag switch on.

21/05/24

- TuMag team at GOC: Julian and Hanna
- Joined remote by Edu to start setting up things
- Downloaded csw log of Friday 17/05/2024 and saved it to Flight 2024/GUIMAG-sessions/
- Ethernet connection is not working initially. The connection by Wifi is super slow, such that commands need to be send several times – better use Ethernet – unplugging and plugging the dock solved the issue
- Updated modes 35, added voltages for LCVRs (similar as done previously for 34)
- Checked duration of 34 and 35, which contain all three lines, and 36 (pinhole): 34 and 35 take approx. 31 secs, 36 needs approx. 24 secs --> As all three lines fit in time almost into the 30 secs for modes 34 and 35, while mode 36 needs less than 30 secs (but currently 30 secs are assigned)
  To discuss: Should we always run them, so only use modes 34 and 35 and discard 61, 66, 67, 68, and 69?
- **Test** cadence (1s) of 55 (FE5250.2 snapshot) for 120 secs: According to HK read out 2 images are received. After a bit of time all images are in filezilla, the cadence is around 1s (most slightly below with some individual jumps above 1s) according to the timestamp in the filename of the images [image folder: 55_Cadence_1s]
  Note: Etalon will be at 2400 V for 10 minutes --> To discuss: Should be no issue according to discussion with Jose Carlos and David on 22/05
- **Test** cadence (5s) of 25 (Singlemode for Obs3.02, longitudinal, 6 accumulations): Takes around 7s, instead of the expected 5s --> To discuss [image folder: 25_Cadence_5s]
- **Test**: Exposure time 28 ms and change cropping: h/v_offset = 768 and h/v_size = 1280: **Overview of values see TIMES_2024.xls in Flight 2024-dropbox folder** [image folder: Short_texp]

- 11_0s+2.02 duration (0s + transition + 2.02 + transition): 12.4 s + 4.0 s + 21.6 s + 13.3 s
- 12_0s+2.06 duration (0s + trans + 2.06 + trans): 12.3 s + 5.5 s + 21.2 s + 4.5 s
- 13_0p+2.02 duration (0p + trans + 2.02 + trans): 37.2 s + 4.5 s + 21.6 s + 13.3 s
- 14_0p+2.06 duration (0p + trans + 2.06 + trans): 37.2 s + 5.9 s + 21.2 s + 4.4 s
- 15_1+2.02 duration (1 + trans + 2.02 + trans): 28.9 s + 4.5 s + 21.6 s + 12.8 s
- 16_1+2.06 duration (1 + trans + 2.06 + trans): 28.9 s + 5.9 s + 21.2 s + 4.4 s
- 17_0s+3.02 duration (0s + trans + 3.02 + trans): 12.3 s + 4.3 s + 8.8 s + 13.5 s
- 18_0s+3.06 duration (0s + trans + 3.02 + trans): 12.4 s + 5.2 s + 9.4 s + 4.8 s

- Temperature variation of the cameras during the day. Temperatures at Esrange where rather low, Andreas talked about -5ºC in the early morning. They opened the dome (for XL-Calibur) around 10:15 h:



22/05/24

- TuMag team at GOC: Julian and Hanna
- Zoom with David and Jose Carlos to discuss results of the previous day and set up tasks for the following days:
    - Cadence of mode 55 (FE5250.2 snapshot) should be more stable – to be run again with switching off the “waiting time” for the voltage ✓
    - Cadence of mode 25 (Singlemode for Obs3.02, longitudinal): Check with engineers whether polarization states are taken two times (old IMaX mode) and test with different accumulations ✓

- Run timeline(s) completely through and check “free times” note them down as those might be valuable during the flight
- Finalize checking of exposure times for science observations modes. The exposure times/accumulations of the calibration modes/settings should not be changed.

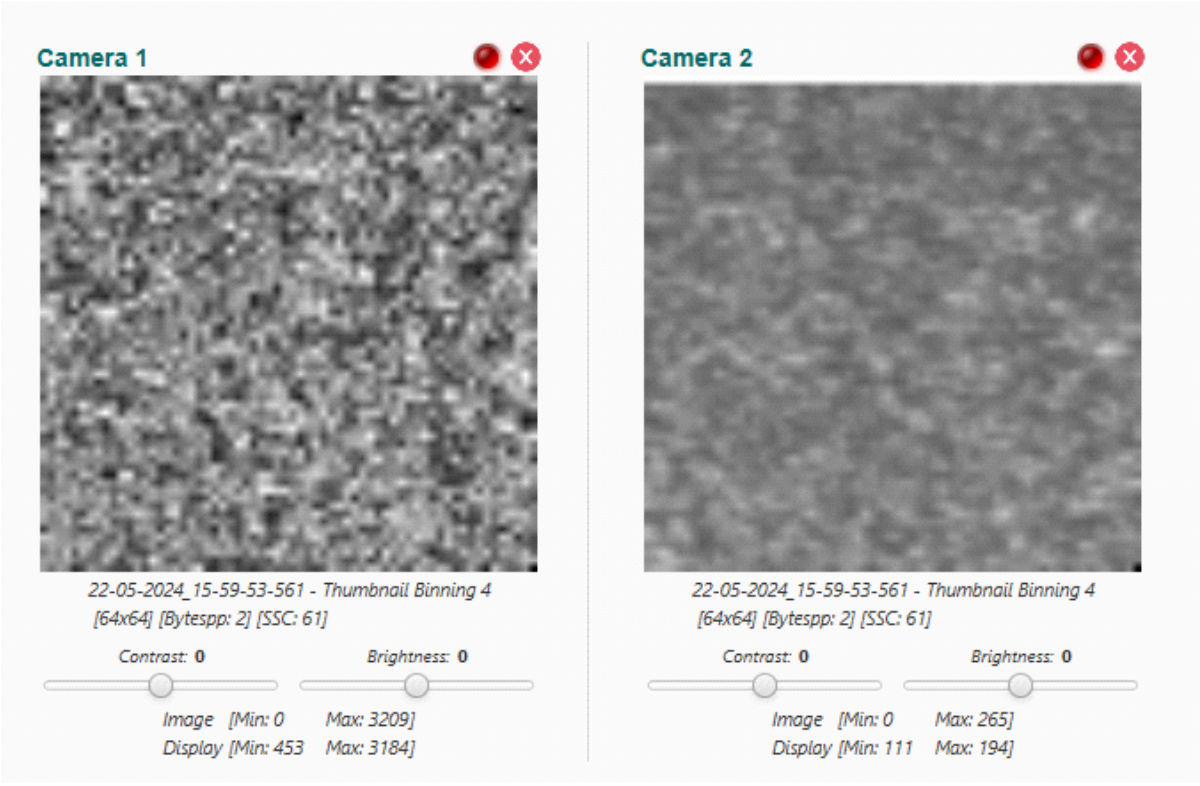
- **Test** cadence (1s) of 55 (FE5250.2 snapshot) for 120 secs again – new settings: For the first dataset wait until the voltage is reached, then skip the check for the remaining ones. --> Stability of the cadence is not improved [image folder: 55_Cadence_1s_nowait]
- **Test** cadence(5s) of 25 (Singlemode for Obs3.02, longitudinal) – new settings: 3 accumulations --> New cadence: 4.35 - 4.36 secs (more regular) [image folder: 25_Cadence_5s_3acc]
  Note: It is still not clear whether the pol. cycle is run through two times (Informed engineers by mail)
- **Test (continued) from 21/05 with exposure time 28 ms** and change cropping: h/v_offset = 768 and h/v_size = 1280; change h/v_size to 256 from mode 23 onwards [image folder: Short_texp]:
  - 19_4+5.02 duration (4 + trans + 5.02 + trans): 45.7 s + 8.5 s + 45.8 s + 10.4 s
  - 20_4+5.06 duration (4 + trans + 5.06 + trans): 45.7 s + 4.2 s + 44.8 s + 4.2 s
  - 21_2.02 duration (2.02 + trans): 21.6 s + 2 s
  - 22_2.06 duration (2.06 + trans): 21.2 s + 3.2 s
  - 23_4 duration (4 + trans): 45.7 s + 1.8 s
  - 24_2.02+2.06 duration (2.02 + trans + 2.06 + trans): 21.6 s + 12.2 s + 21.2 s + 7.6
  - 25_3.02_6acc: 4.86 s + 1.4 (not in TIMES_2024.xls as acc deviate from the others)
- **Test with LED and varying accumulations, Overview of values see TIMES_2024.xls in Flight 2024-dropbox folder** [image folder: Short_texp]**:**
  - 15_1+2.02 with 28 ms exposure time and 16 acc
  - 15_1+2.02 with 42 ms exposure time and 16 acc - duration: 35.7 + 4.5 + 27.1 + 12.9
  - 15_1+2.02 with 42 ms exposure time and 20 acc - duration: 42.3 s + 4.6 s + 32.3 s + 13 s
  - 11_0s+2.02 - 42 ms exp. time; 4* + 20 acc – duration: 13.5 s + 4 s + 32.2 s + 13.5 s

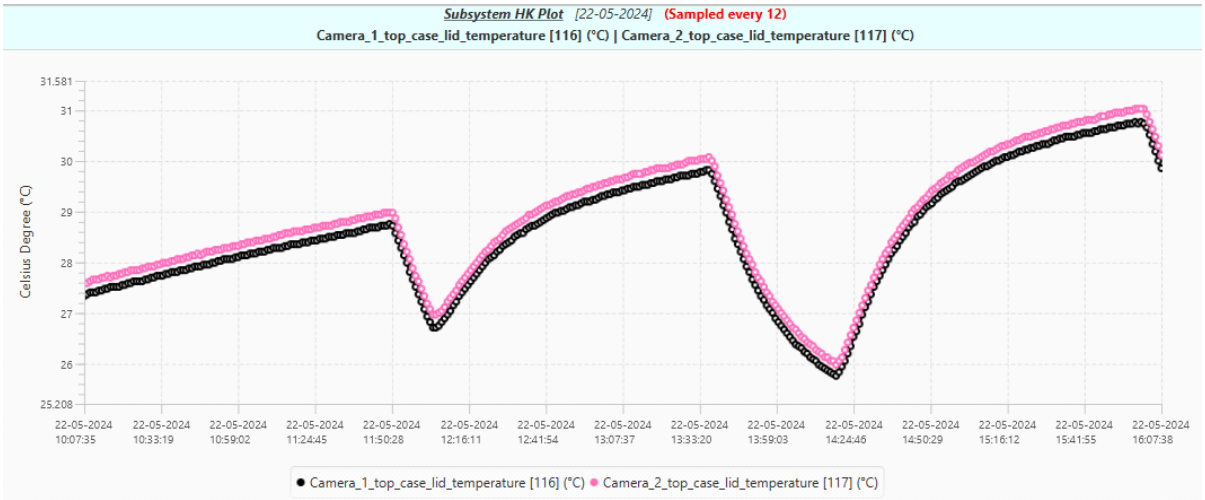
    0s does not deviate much from the 12.2 s with 16 acc and 28 ms but deviates a lot from the values in TIMES.xls from 2022, which is 27.316 s --> double check 0s for 16 acc and 42 ms exp time
  - 12_0s+2.06 - 42 ms exp. time; 4* + 20 acc – duration: 13.5 s + 5.5 s + 32.3 s + 4.6 s

- 13_0p+2.02 - 42 ms exp. time; 20 acc – duration: 53.3 s + 4.6 s + 32.3 s + 13.5 s
- 14_0p+2.06 - 42 ms exp. time; 20 acc – duration: 53.5 s + 6.0 s + 31.9 s + 4.6 s
- 16_1+2.06 - 42 ms exp. time; 20 acc – duration: 42.3 s + 6.2 s + 31.9 + 4.5 s
- 17_0s+3.02 - 42 ms exp. time; 4*+ 25**acc – duration: 13.5 s + 4.2 s + 12.7 s + 13.7 s
- 18_0s+3.06 - 42 ms exp. time; 4*+ 25**acc – duration: 13.5 s + 5.2 s +13.2 s + 4.8 s
- 19_4+5.02 - 42 ms exp. time; 13***acc – duration: 74.4 s + 8.7 s + 74.6 s + 10.2 s
  Camera1 has max values of more than 4000
  Taking some test images shows that Camera1 is by a factor 10 more saturated than Camera2. Both Cameras have reached a temperature of more than 31ºC at the end of the observations. We had switched them off two times during the day to allow them to cool down.

* 0s has 2 accumulations in general, increase to 4
* 3.02 has 20 accumulations in general, increase to 25

*** 4 and 5.06 have 10 accumulations in general, increase to 13





23/05/24

- TuMag team at GOC: Julian and Hanna
- **Continue Test with LED and varying accumulations**
    - 20_4+5.06 - 42 ms exp. time; 13*** acc – duration: 74.4 s + 4.3 s + 73.5 s + 4.3 s
    - 21_2.02 - 42 ms exp. time; 20 acc – duration: 32.3 s + 2.3 s
    - 22_2.06 - 42 ms exp. time; 20 acc – duration: 31.9 s + 3.4 s
    - 23_4 - 42 ms exp. time; 13*** acc – duration: 74.4 s + 2 s
    - 24_2.02+2.06 - 42 ms exp. time; 20 acc – duration: 32.3 s + 12.6 s + 31.9 s + 8.2 s
    - 25_3.02 not tested, as the cadence should be short, if we would have to increase the accumulations (exposure time) than this is no longer fulfilling the purpose of the science idea)
- Connect with Antonio remote to check the stability of the cadence for the 55 (FE5250.2 snapshot) and run several tests
    - In the nominal mode the “nscan” in the settings defines the number of scan repetitions, this however does not exist for the calibration modes, such the repetition is defined as an outside loop where the cadence depends on “outside parameters”, e.g., the CPU load, memory etc.
    - Addition in calibration mode the size of the frame influences the cadence with a size of 256x256 we got a cadence below 0.5 ms

--> Contacted David to get his opinion on how stable the mode needs to be run for the scientific purpose

- Checked the usage of the 66 and 68 modes in the timelines (in gitlab) --> For the majority only mode 34 and 35 are used
    - SP1 and QS_HC use modes 66 and 68
    - Check in detail in gitlab reveals that there 34 and 35 contain only two lines – discrepancy between the .upds and the commanding for the timelines
- Started check of duration of all modes with "nominal" values for FOV, accumulations and exposure time – see tab "duration of modes" in TIMES_2024.xls

24/05/24

- TuMag team at GOC: Julian and Hanna
- Julian updated in gitlab the voltages for the LCVR for modes 34, 35 and 61 and changed 34 and 35 such that all three lines are taken
- Continue check of duration of all modes with "nominal" values for FOV, accumulations and exposure time – see tab "duration of modes" in TIMES_2024.xls
- Synchronize time to get the time in the header of the thumbnails correct(done on the previous day together with Antonio, better do daily): In DECO --> framegrapper --> fg_update_send_fg_amhd
- **Timeline test of QSDC_HC**
    - Data can be found in folder: Desktop/TEST_QSDC_HC/
    - Really long waiting time after flat field (mode 42), which takes around 2 min, but the time assigned is 17 min
    - Camera 1 shows again problems, starting 12:01:01, with max values with a factor of 15 higher than Camera 2. Then recovers itself at 12:21:16, with a strange image before head, at 12:30:16. Problem back at 12:33:24, with another strange image at 12:40:14 and 12:41:1. Then fixes itself at 12:45:15. Problem back for the last two thumbnails at 12:48:18 and 12:48:49. Switch off cameras directly afterwards as timeline ended.
        - Temperatures of cameras have exceeded 30ºC.

25/05/24

- TuMag team at GOC: Julian and Hanna

- Run Synchronize time to get the time in the header of the thumbnails correct(done on the previous day together with Antonio, better do daily): In DECO --> framegrapper --> fg_update_send_fg_amhd
- Continue check of duration of all modes with “nominal” values for FOV, accumulations and exposure time – see tab “duration of modes” in TIMES_2024.xls
- Cleaned up .udps in GUIMAG: Moved all the old, which appear with the same number as an updated (in use) one to a separate folder
    - Updated accumulation numbers for PDs
- Julian updated the commands in the gitlab:
    - Moved old unused ones to a separate folder
    - Added the LCVR voltages to mode 69

28/05/24 - 29/05/24

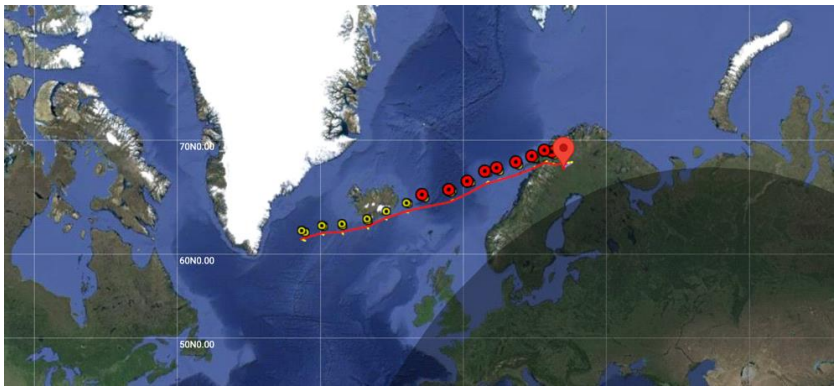
- TuMag team at GOC: Hanna plus Jose Carlos, Julian, Dani, Edu, José Miguel, María online
    - Remote access to main computer with GUI by Edu
- Deleted remaining images on TuMag /images/
- Julian has updated a few more things on the webpage
    - Added duration for the individual modes
    - Updated 34 and 35 descriptions
    - Added calibration timelines as sperate lists

Switch on TuMag 22:13 UT

- Run Synchronize time to get the time in the header of the thumbnails correct(done on the previous day together with Antonio, better do daily): In DECO --> framegrapper --> fg_update_send_fg_amhd
- Run in SR3-IMAXP-PR-AV600-006_1_F Pre_Flight_Ascent_Commisioning_Procedure_As_Run.docx the TuMag Preflight Tests
- Flight cancelled at around 01:25 --> Go to safe mode
- **NOTE: Running the time synchronisation with framegrapper --> fg_update_send_fg_amhd switches off the heaters. Going to safe and to science again switches the heaters back on but leads again to the time synchronisation issue.**

31/05/24

- Science meeting starts at 7:00 pm

- No flight today
- Trajectory too far to the south.
- 

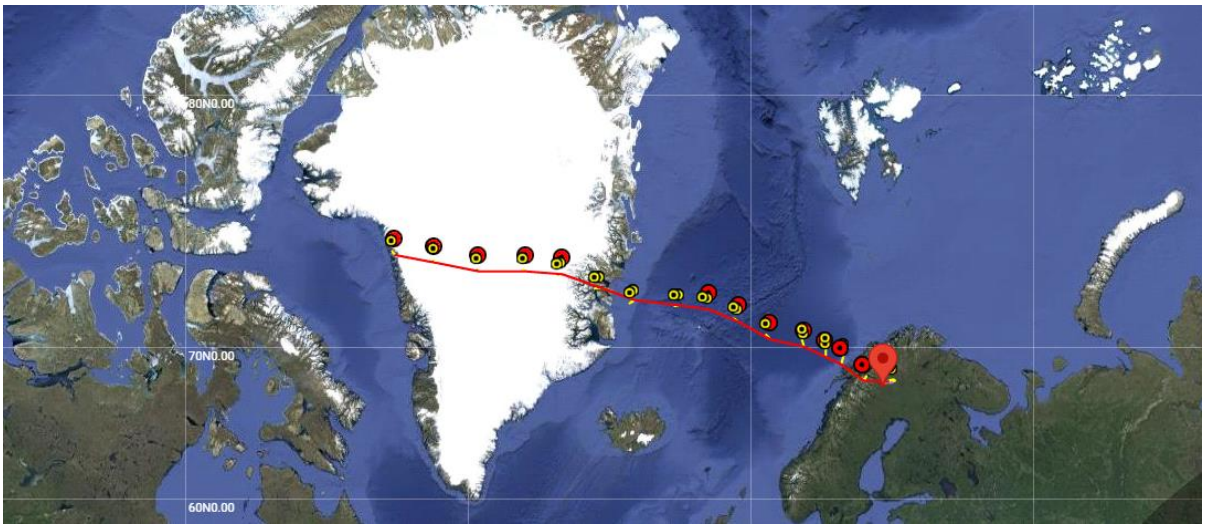
  -

01/06/24

- Science meeting starts at 7:00 pm
- Trajectory forecast for Sunrise improved… although it continues to shift somewhat to the south
- No flight today due to bad weather conditions at Kiruna

02/06/24

- Science meeting starts at 6:30 pm
- Nice trajectory forecast for Sunrise



- Launch opportunity at 03/06/2024 2:00am
- 19:00 - TuMag team at GOC (shift 1 + Jose Carlos & David): Jose Carlos & David, Hanna, Julian, Edu (Dani online)
- 20:00 – TUMAG Switch ON (17ºc)
- 21:00 – **TUMAG PreFlight tests has been passed!**
    - The OB heater has been switched OFF (camera temperatures increasing too much). **It has to be switch ON on ascent phase!**
    - The time difference between HK datetime and thumbnail timestamp is around 36s
- 00:30 – Flight cancelled…

18/06/24

- TuMag team at IAA: A. Sánchez, E. Bailón, J.M. Morales, JC del Toro, Luis Bellot, Dani Álvarez
- ***Sunrise Surprise Showtime Test!***
    - 13:30 – Tumag switch ON and Functional Tests OK
    - 14:20 – Tumag switch OFF

10/07/24

- TuMag team at IAA: JC del Toro, Dani Álvarez
- *Team at COG: Hanna, Jose Miguel*
    - 04:21 – successful flight
    - TuMag heaters to ascent phase mode
    - We are flying with all mechanisms off
    - Temperatures during ascent seem nominal
- At 8 am, change to Pablo and Julian at COG. David and Antonio S. at IAA.
- 9:25 set science temperatures set point manually (UDP)
- 9:29 we setup the cameras temperature to 15 degree (for the moment). Science will be at 20 but we want to see if the heat from the instruments is enough to heat up the cameras above 15 degree.
- **WARNING**: We have detected that Guimag temperature values of the cameras oscillate in the program interface giving the impression that the temperature is oscillating as well as the set-point. It's not real. Cameras temp are fine.
- 9:37: Start the instrument tests without checking / moving mechanisms. Waiting further instructions from GOC.
- 9:59 still checking the h/k. At some point we switched on the FW and apparently the Gondola saw the movement of the filter wheel. I do not think so (orozco) but that was said by Achim.
- 11:20 Still waiting. Optimization of telescope pointing and CWS have been performed. Now, working on limb detection. Some problem from pointing detected, high disturbance, made curtain go to closed mode. They are going to try again (maybe change some thresholds).
- 12:00 starts the FW calibration
- First light!!!!
- Around 14:00 we started the commissioning of the instruments. The communications are a bit messy at the GOC. Lot of noise.
- Filter scans:
  10:30 Scan 517.3, 12:30 Scan 525.02, 12:41 Scan 525.06. They look fine. Just a bit shifted in voltage and a bit more flat (less inclination between continuums, etc). Not clear why, maybe effect of different F# that widens the prefilter.
- **12:50: Run comm_4 (autofocus).** Timeline running but no thumbnail arriving. Problem with the thumbnail creation configuration, need less time between thumbnails

- **13:14: Run comm_1 (minimum success).** Antonio investigates thumbnail problem and fixes it forcing less obligatory time between thumbnails. Photon flux seems to be fine, 30k with 16 accumulations at disk center = 2k / acc.
- 14:13: Repeat photon_flux, now at disk center. From Pablo's analysis 42 ms would have aprox 1200 counts per accumulation instead of the older 1600.
- 14:21: Repeat prefilter scans, 14:25 525.02
- …
- 16:24 Run comm_2 with CWS autolock
- Thumbnails a montón

- **17:05 EMF_1, -55 -215 region Cartesian**
    - Issue with thumbnail image vs voltage supposed position:
        - 16:41:25, Count 415, -2238 V should be core looks like core fine
        - 17:13:08, Count 439, -2233 V should be core looks like continuum
    - 18:17 Timeline stopped at the beginning of actual observation (i.e. after calibration) bc pointing lost. Probably during flat field lost pointing. Re-pointing and then we will re-start where it stopped.
    - **02_line_repeated_thumbnails.udp** created to acquire thumbnails every 25 s for finepointing.
    - 18:54 Still stopped waiting for pointing. Ping received (HK Alive) while doing nothing, no reason for it. Maybe some TM dis-/re-connecting? SCIP received also similar one 10 minutes before TuMag.
    - 19:13 Re-start timeline in the observing mode
    - We have just determined that Cam 2 is NOT flipped, in relation with HMI. Use cam 2 thumbnails for the 02_line_repeated_thumbnails udp
    - 20:34:58 (for us, 20:35:05 from CWS): jump in pointing of some 50 pix? Not clear what happened, if pointing or CWS, under investigation.
        - 21:07 For short calibration, we go to disk center for SUSI flats but automatic command from pointing does not work, needs to be commaned manually
    - 21:25 continue with the timeline after going back to the previous position after flats

- 23:32 cameras heater temp around 17 degrees

157	Camera_1_Heater_Temperature	16.7	°C	19.5	25.0	camera1	fgdpu
158	Camera_2_Heater_Temperature	16.08	°C	19.5	25.0	camera2	fgdpu

- 23:28 stop the timeline for command correction of CWS
- 23:41 continue with the timeline
- 23:43 starts the long calibration of the timeline
- 23:46 GSENSE cam1 is lower than the minimum value set in the range of the HK

369	TuMag_Camera_1_Internal_GSENSE_Temp	18.87	°C	19.0	33.0	camera1	fgdpu
370	TuMag_Camera_2_Internal_GSENSE_Temp	19.22	°C	19.0	33.0	camera2	fgdpu

- In the PD calibration cam1 send an image of a dark. Cam2 works fine

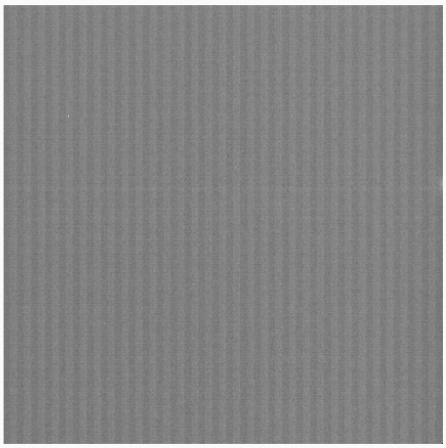


Image Struct Size: 61 Bytes

Camera ID	Observation Mode	Img Size (Bytes)
Camera 1	Calib Phase Diversity	8128512
Image Type	**Img Index**	**TimeStamp Start**
Thumbnail Binning 4	2501	10-07-2024_23-47-39-572
nAcc	**Img Index End**	**TimeStamp End**
40	2500	10-07-2024_23-44-58-022
ROI X Size	**ROI X Offset**	**Pipeline Config**
2016	16	All Blocks DISABLED
ROI Y Size	**ROI Y Offset**	**OM Counter**
2016	16	10

FW1 Pos	LCVR1 Volt (V)	Etalon Volt (V)
P.D. P.D.	2.29 2.29	2884.65 2890.11
FW2 Pos	**LCVR2 Volt (V)**	
W0-525.02 W0-525.02	2.37 2.37	

Commanded | Real

Image Display Info (Counts)				
	Min	Max	Mean	SD
Image (real)	0	235	130	4
Display	116	144		

11/07/24

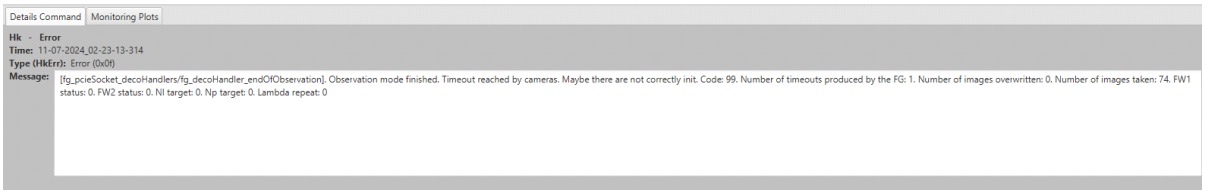
- 00:04 Time zone for the master PC again changed to UTC+2 due to a problem with the reception of HK (thanks to Pablo and Julian experiments XD). Now everything works fine.
- 00:29 We have lost the LOS

- 00:41 EMF_1 finished

- 01:07 Thumbnails to check the position of the pointing system
- 01:15 Problems with the limb finding of the pointing system
- 01:25 power cycle of the CWS
- 02:06 limb sensor found by the gondola and CWS
- 02:10 fine-pointing

- **02:20 SP_4, large leading spot of AR 13738**

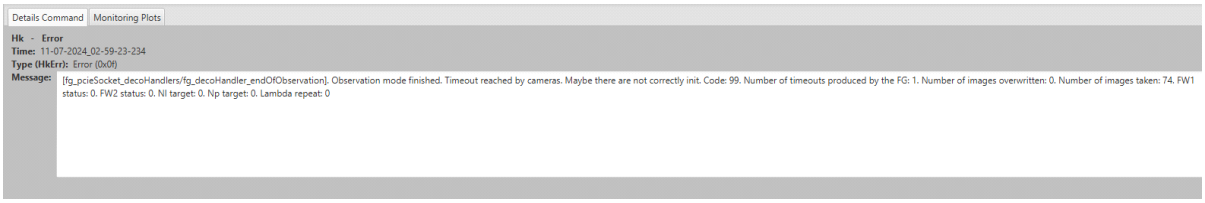
  - **02:23 error code 99 by cameras in timeline. 5 times. This error is recovered automatically by the CSW**



  - **02:35 power cycle of the cameras**
  - **02:34 SP_4 finished (1)**

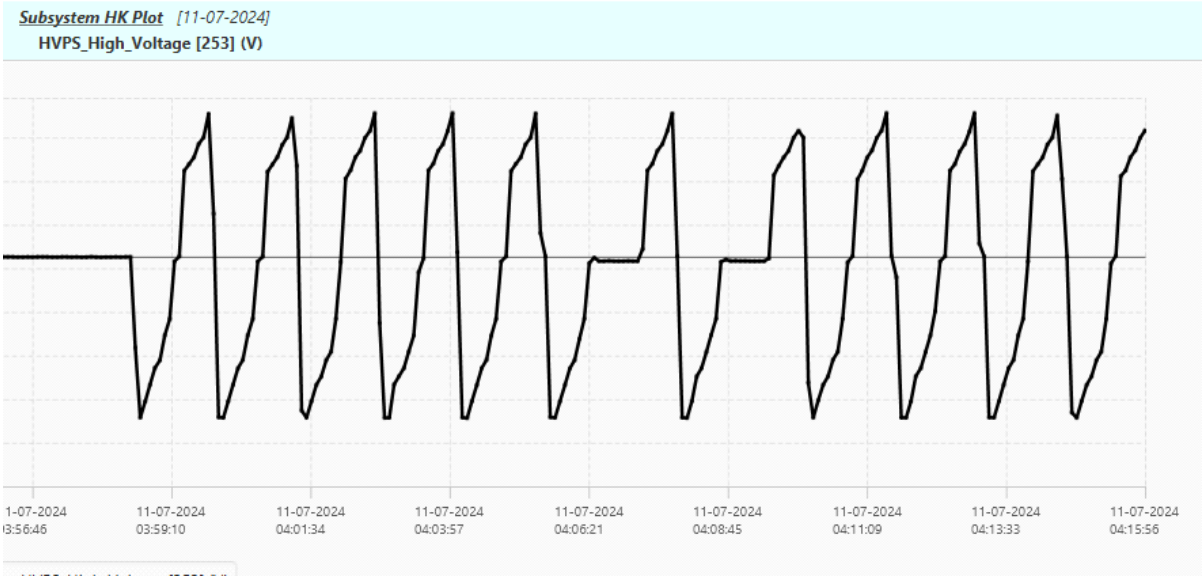
- **02:42 QSDC1**

  - **02:59 start again the error 99 in cameras during the flats. The problem appears in the last step of the obs-1 with lambda=4**



  - **We continued with the timeline**

- **Error 99 during the obs+obs2.02**



- Thumbnails generated by command 51 at 6:30 and 8:55 are corrupted.
- Relaunched QS8 manually by launching command 15 with an offset of -100V for Obs Mode 1. At 9:05
    - During flats of QSDC_1, same procedure for flats of mode 1, abort the commanded mode and run the flat udp with the voltage offset to calibrate the previous observations
- 11:38:05 launch manually extra flats for mode 1 with offset voltage because there is a 5 minutes time while the rest of the timeline finishes. 3 complete scans have entered, the last one almost but no. Continue timeline.
- **11:52 QSDC_1 timeline finished!**

- Looooooong pointing search. Veeeeery long. Offset between HMI and CWS is in Y direction approx. 50”? Long search comparing in the sunspot of SP_4

- **12:40 FS_1 full spectral scan**
    - 12:51:26 Thumbnails from PD arrived, one looks fine the other like a dark. Is it thumbnail or something else?
    - 14:46 Spectral scan commissioning getting thumbnails, for 525.02

- 14:49 Launching 0s+2.02 for testing
- 15:16 Continue timeline after calibrations
- 16:11 CWS unlocked – 16:16 CWS recovered
- 20:45:50 Pointing lost. So much lost that there is no Sun (closed curtain?) – 20:48:52 recovered pointing and CWS locked
- 21:03 Cover 1 filterwheel temperature drop to 24.67 and keeps dropping
- Timeline is longer than planned. SUSI had an issue that required stopping their timeline while TuMag and SCIP continued, and they restarted after some 25 minutes. When the planned observation end arrived, we continue observing while SUSI catches up and then we did the calibrations all together.
- 22:19 Observations from timeline stops finally! Continue with calibrations
- 22:27 PD set: thumbnails received show, as previous times, one camera fine (here, cam 2) the other as dark (cam 1). Are those first images fine and is only in thumbnails?
- 23:23 The night has catched up with us. Hopefully we are used to living the night.
- 23:35 Using a 40-minutes gap in our timeline, we manually take flats of mode 1 with the voltage offset introduced this morning to test to solve the 99 problem. Udp used:

  71off_flats…_offset.udp
- 23:51 Repeating the same flats mode 1 with offset

12/07/24

- 00:16 Take flats mode 0p 5 repetitions, 00:29 ends
- 00:46 FS_1 finished!!

- Until 01:18 Find center and check pointing Still no perfect pointing but too far south and a bit too much to the west. Fine pointing will be done after the calibration block. Coma correction for CWS.

- **<u>01:30 AR_1</u>**

- 01:36 Stopped TL because SUSI is having problems finding the line, including interruption from starlink
- 01:41 Restart and Start of calibration block with the PD showing again a “dark-thumbnail”
- 02:00 Curtain closed and 02: 01 pause of TL in the middle of flat field Obs1
- From 2:02 until 02:20 NO HK received, only thumbnails, as the instrument had continued in the flat field mode
- 02:20 Perform a Software reset, after abortion (to make sure the flat field mode is stopped)
- Set Cameras and optical bench to set pint of 15 C
- Very fast drop of the temperatures of the optical bench and the cover 1
- STOP TL completely at 02:24 and decide to restart the whole TL
- Starlink connection unstable around 02:29
- Gondola is having issues and cannot be moved while the FF mode is working
- We are getting less power from the solar panels, not clear how long we will be able to run the instruments
- 02:50 Restart of AR_1
    - 02:57 enter calibration block; PD thumbnail with the same issue as before, second one dark
- **Abort TL at 03:28**

- 03:31 Run reduced_power_mode.udp to move into reduced power mode (originally prepared for the night case)
- 03:40 Switch off heaters of cameras and PMP duty cycle to 25 –> non-operational power mode
- 4:03 Switched off cameras with SCIP
- 04:15 Put instrument into safe mode and switch off
- 04:33 Power on TuMag – HK at 04:34:

    - SSD heater at -18 C
    - Put set points of cameras to 15 C, temperature of E-unit approx. -24C
- 04:37 Loss of HK until 05:24
- 05:24 We are still not receiving HK, but are on Power cycle – on at 05:26
- 05:28 HK received, go to science mode – back in science mode at 05:30
- 05:33 – 05:38 no HK
- 05:42 Curtain open
- 06:00 Run Obs 15 for 2 repetitions.
    - First thumbnails are blank in both cameras
    - Error 99 at -90V for the second repetition
- 06:12 Run Obs 15 for 5 repetitions to test for occurrence of 99 and check the camera, done at 06:18
- 06:45 Run Obs 15 for 5 repetitions to test for occurrence of 99 and check the camera, done at 06:52
    - Error 99 during the first repetition at last two voltage steps (lost 4 images)
- 06:45 Run limb finding routine
- 06:55 Run Obs 15 for 5 repetitions to test for occurrence of 99 and check the camera, done at 06:58

- **07:02 AR_1, leading spot of AR13743**
    - 7:17-8 Error 99 during straylight calibration. Afterwards, all fine again.
    - 7:53 Tried to send two or three udps and not arriving. Martin did some magic and received again
    - 7:59 Flats for 3.02 launched using a timeline gap after usual flats. Only taken 3
    - 8:01 Tried again more flats but again ignoring TCs sent. Maybe blocked unless specifically asked
    - Buscando la region active y el punto exacto más de una hora…

- 9:22 PD launched taking a free moment
- …
- CWS has bug and does small jumps from time to time
- 11:35-11:40 Timeline paused while CWS corrects bug
- PD commands for timeline (33, 64, 65) updated into ICU to change number of images from 40 to 32 to fix problem of losing images and/or image memory permanence (see issues with dark-PD thumbnails previously)
- 12:37 restart timeline (still in AR_1, remember) into next observation block after bug, pointing, pointing, pointing,…
- 13:28-13:29 CWS lost -13:39 CWS back, different position. Changing a bit positions during scan
- 13:42 CWS lost again – 13:44 CWS back. Change a bit position during scan
- 14:01 CWS lost again – 14:04 CWS back.
- 14:25-14:26 CWS lost? At least big jump. Back at 14:29? More and more jumps of the AR towards the edge of the FOV

High elevation leads to worst quality, more unstable, roll tries to correct and generates high frequency vibrations. Also, more unstable tip-tilt mirror today, makes more jumps.

- 14:38 starting calibration block. At the same position, we will pause and go disk center for flats? Went to disk center-flat field region for PD, flats, etc. PD and Stray light missed in the timeline, need to do it manually later.
- 15:44 Extra PD to compensate for missing one
- **15:46 AR_1 timeline finished**

- **16:04 cal_pd run but CWS missed**
- **16:28 -16:30 cal_pd timeline**
- **16:35 -16:36 cal_pd timeline** with increased thumbnail cadence

- 16:40-45? ICU lost communication – Recovered around 17:10-20. But TuMag could not communicate with ICU and it interpreted we were dead. It was stuck the communication and needed a power cycle. Back around 17:15.
    - Around 17:30, instead of setting the setpoint for camera heaters, they were set off. Optical bench heaters were set to 15 correctly
- 17:41 Spectral scan commissioning 2.02
- 17:42 Flats 2.06, just for heating up
- 17:58 PD 2.02+Mg 32 images. Not locked
- 18:3? Spectral scan commissioning 2.02 cropped
- 18:3? Spectral scan commissioning 2.02 binned

- **18:35 QSDC_HC**
    - PD still with problem seen in thumbnails, one camera is dark the other is correct image. Change to 32 images not worked
    - Flat aborted after aprox. 1 mode and restart by udp with the offset voltage created to compensate the line shift for QSDC_HC
    - 18:59 Error 99, missed half of fisrt flat
    - 19:03 Another flat series 3.02 with offset
    - 19:07 Another flat series 3.02 with offset
    - 19:10 Another flat series 3.02 with offset
    - 19:16 Mode 25 aborted after aprox. 1 mode and restart by udp with the offset voltage created to compensate the line shift for QSDC_HC
    - Last observation run has 6s cadence (according to saved datasets filename), expected had been 5 s
    - **19:49 QSDC_HC finished**

- **20:04 AR_HC**
    - Jumps in lock point during prefilter scan

- 20:19 Hardware reset to reset framegrapper after dark, before PD Successful: No dark thumbnail in PD
- 20:29 Flat aborted and restarted with shift
- 20:33 Second flat series
- 20:37 Third flat field
- 20:46 Pause TL for fine pointing Restart 20:57
- 20: 58 Abort and start Udp 25 manually with 6 accumulation and voltage shift (7 secs cadence)
- 21:09 Abort and start high cadence snapshot with offset manually, loss of HK, causing the offset case to be started around 3 min delayed
- 21:20 Abort and start Udp 25 manually with 6 accumulation and voltage shift (7 secs cadence)
- 21:32 AR_HC ended

- 21:33 Take high resolution thumbnail of large sunspot
- 21:35 Cameras heaters switch on (see 17:30 issue) with 15C set-point

- **21:54 SP_1**
  - Hardware rest for PD after darks
  - **Abort TL 22:11**, as CWS lost lock point and PD could not be performed

- **22:33 SP_1, leading spot of AR13743**
  - Hardware rest for PD after darks (22:44) PD fine
  - 23:26 Run additional udp. 42 with offset for HC TL
  - 23:39 Stop TL for fine pointing to Sunspot, ICU crashed, Curtain closed… waiting… drop ballast after loss in height…waiting…finding lock point in sunspot at south eastern umbra-penumbra boundary

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- 00:58 Continuation of TL
- 01:02 TL stopped, as SUSI did not understand which observation mode they were, abort observation manually
- 1:09 Restart TL by starting into the observation block
- Drop of ballast causes loss of lock point 01:19 Smeared thumbnail OCs: 211
- Spot is no longer centered, but they prefer to continue the observations as more drops of ballast might happen
- Observations are unstable for locking most likely because of seeing, as we are pointing downwards through the atmosphere
- Around 01:27 next drop of ballast (last for the night) – balloon starts rising again afterwards --- Really unstable conditions while we are crossing from the Ocean to land
- After 01:27 stop receiving thumbnails
- 01:53 Abort
- 01:54 Go to safe mode
- 01: 54 Perform SW reset
- 01:56 go to science mode – set camera heaters set point and optical bench to 15C, filter wheel calibration
- Test thumbnail acquisition fine
- 01:59 start udp. 16 manually and join observations
- We received the following error running the SP1 timeline command 16:
  2024-07-13T01:25:25 - [error] - ICU Error. Details: While sending thumbnail to the ICU. [Size/Sent]: 254582 / 0 bytes... Returned by the ICU [code/text]: [2] / [Cannot write to data channel] - [Thread: 31878 - Icu_IF.cpp:3688]
  2024-07-13T01:25:25 - [error] - ICU Error. Details: While sending thumbnail (Image: /mnt/data/images/2024_07_13_01_25_24_279_1_15281.thm) to the ICU. Size of thumbnail queue: 1 - [Thread: 31878 - ThumbnailManager.cpp:606]
  After that, we did not receive thumbnails and the CSW generate the next one:
  2024-07-13T01:28:38 - [error] - Error Opening File. Details: While Opening File /mnt/data/images/2024_07_12_17_28_55_554_1_0.img. - [Thread: 2376 -

Util.cpp:2712]
2024-07-13T01:29:14 - [error] - Error Opening File. Details: While Opening File /mnt/data/images/2024_07_12_17_28_55_554_1_0.img. - [Thread: 31876 - FgImageManager.cpp:93]
2024-07-13T01:31:09 - [error] - Error Opening File. Details: While Opening File /mnt/data/images/2024_07_12_17_28_55_554_1_0.img. - [Thread: 31876 - FgImageManager.cpp:93]
2024-07-13T01:32:37 - [error] - Error Opening File. Details: While Opening File /mnt/data/images/2024_07_12_17_28_55_554_0_0.img. - [Thread: 31876 - FgImageManager.cpp:93]
2024-07-13T01:32:58 - [error] - Error Opening File. Details: While Opening File /mnt/data/images/2024_07_12_17_28_55_554_0_0.img. - [Thread: 31876 - FgImageManager.cpp:93]
We tried to solve the problem reseting the ICU interface (I think that the problem was not there) and trying to disable/enable the generation of thumbnail, but nothing worked, so we performed a SW_reset. After the SW reset everything is working fine and continue in the timeline.

- Local midnight passed at around 02:57: Everything is rather cold, seeing is still not good
- Stop TL for fine pointing after stop within first calib block before last thumbnail
- 03:45 Continue TL after fine pointing
- 03:56 Stop TL for fine pointing (before last Thumbnail in calib block)
- 03:58 Continue TL
- 04:08 Abort all due to several errors 99 in a row – switch off cameras + switch off HVPS and wait 1 minute, then Hardware reset
  Change off lock point for SUSI in between
- 04:12 Continue with udp. 17 commanded manually
- 04:40 Pointing lost
- 04:46 Locked again, lock point shifted north
- 05:18 Loss of Lock point
- 05:22 Locked again similar
- In between 0:26 and 4:26 the temperature of the filterwheel has decrease from 34C to 22C

    - 06:21 Stop TL for fine pointing after small calibration block
    - 06:25 New lock point selected, TL continues
    - 06:56 Lost lock point
    - 06:58 Stopped TL
    - 07:05 Locked again
    - 07:18 Lock point lost
    - 07:25 Locked again
    - 08:45 SP_1 ends

- 09:08 ICS had to be reset and then the housekeeping from pointing system was lost, had to be restarted

- **09:13 FS_1 (modified), AR13743 following flux emerging region**, started after 3 tries (it was starting in some middle point)
    - 9:23 Abort PD to run a different PD(64comm) but not clear when arrived as the TM was bad and had to be sent from the 2nd egse; or if the new PD was run. Some PD arrived but…?
    - 9:28 flats from 0p aborted and flats for 2.06 started with 14 repetitions
    - 9:57 more flats for 2.06 launched
    - 11:08 flats mode 1 with -100 V offset (see first day)
    - 11:19 Prefilter scan .06+Mg
    - 11:26 Prefilter scan .02+.06
    - 11:42 Abort timeline command for 2.02 obs, run PD for .06+Mg
    - 11:44 Run 1+.06 obs
    - Around 12:29:34 (for example), M-class flare seen beautifully in Mg. Happiness and clapping all around. Missing real beer for cheering.
    - 12:56 CWS lost, recovered soon with small jump in FOV losing a bit of sunspot.

- 13:01 CWS lost again… recovered. Adjusting pointing during closed loop.
- 13:53 CWS lost. Some dataset with it locked but at different position. Searching for the original one
- 14:26 CWS lost.
- 14:33 Abort timeline + PD Mg+.6 at spot position
- 14:37 Calibration call_1. CWS lock lost at last part of PD (hopefully here and not in the one before). 15:03 Flats 0s run, 7 repetitions.
- 15:10 FS_1 stopped

- **15:30 FL_1, AR13743 following flux emerging region**, same region as before, originally planned CLV_1 is moved to try find another flare
  - 15:42 or before aborted timeline not clear the last observations if were taken moving or what. Go for CLV_1 timeline

- 15:45 While taking thumbnails for searching for CLV_1, error in thumbnails, the one that happened days ago of saturated-corrupted part of the image. Performed power cycle of cameras and fixed the error.

- **15:50 CLV_1**
  - Stopped a bit at 16:56 for… slits alignment? Pointing? Complete loss of focus
  - 17:31 Line scan before re-entering the TL
  - 17:33 Continue TL with science observation block
  - 17:36 Loss of lock-point – 17:43
  - 19:31 Stop of TL after first observation block in CALS_1

- **20:00 PL_1, south (western) pole**
  - 20:14 Stopped for a minute because of issues with the data storage

- 20:52 Extra flat: Flat PD, aborted, as scan through voltage range is super-fast, started seond
- 21:08 Stop TL for pointing to the limb
- 21:32 Run voltage scan at the northern pole – add an offset of -200 V to upd 23: Obs4_-200volts_offset.udp
- 22:06 Run voltage scan at the southern pole as pointing was too unstable at the northern pole – add an offset of -150 V to upd 23: Obs4_-150volts_offset.udp
- The gondola is moving a lot, most likely because we are reaching land and the direction is changing
- 22:12 Continuation of TL with Obs Mod 4
    - 23:13 Code 99
    - 23:27 CWS lost, recovered after 1 min. Slight change of position.

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- 0: 00:20 Timeline finished. Flipping, 2 hours of limb with only one small mistake of CWS :O

- **00:30 SP_4, leading spot of AR13743**
    - 00:33 Code 99. It appeared when CWS lost lock, like it happened during yesterday night several times. And in days before also?
    - 00:34 Abort: CWS was jumping and we search better CWS lock

- **00:39 SP_4, leading spot of AR13743**
    - 00:40 CWS lost lock again so repeat process. No code 99 though.

- **00:45 SP_4, leading spot of AR13743**
    - Maybe there was a CWS jump or large jittering, nobody sure
    - 0:58 SP_4 finished (2)

- 00:59 Flats for PD using PD_flat_fields (created today)
- 01:04 Flats for mode 1 with -150V offset using 37_FlatObs1_-150volts_offset.udp (for using with pole timeline)

- **01:16 AR_3, Plage region AR13742**
    - 01:28 Framegrabber reset after dark before PD – fine
    - 01:56 Stop of Tl for pointing to sunspot
    - 02:24 Continuation of TL
    - 02:29 Loss of pointing until 02:36
    - 02:33 Loss of HK until 02:52 but receiving thumbnails. We perform some reset ICU interface but nothing happens. Tino said that the ICU is distributing data without any problem. At this point we perform a reset of the scheduler and it works.
    - Error 99 at 03:06, 03:19
    - 04:04 start of losing the lock point, very unstable in the following time unit xx:xx with very strong seeing and low light level as we pass local midnight (Predicted was 04:36 based on old flight pass), error 99 at 04:09, 04:19, and 04while the CWS tries to re-lock
    - 04:46 Hardware reset
    - 05:04 **AR_3** ended

- **05:07 CALL3** (the Ping thing)
    - Run different flat and PD udps manually

- **08:24 East Limb scans (north)**, mode 1 run manually
    - 08:25 Code 99. First (or few firsts) scan not good due to 99
    - 08:27 Code 99
    - 08:31 CWS lock lost, re-locked on the fly, similar position.

- 08:57 CWS lock lost, re-locked on the fly, similar position but even less limb, almost nothing.
- 09:01 Stopped and finish this “timeline”

- **09:10 CLV_1 short, at AR plage region at eastern limb at 0.7mu**
  - 9:19 Typical problem with thumbnails not arriving, blocked by ICU or whatever.
  - 10:08 We perform software reset to try fix the thumbnails thing. After wake up, go to science, re-calibrar las ruedas, optical bench & camera1 & camera2 setpoints to 15, switch everything off,… And it is fixed, we get thumbnails!
  - 10:48 Continue timeline with the observations
  - First dataset at 10:50 maybe flat? Strange
  - Comma aberration is high and gets a bit higher towards 11:40 but correction is still ok
  - 12:46 CLV_1 short stopped after short calibration (flats done at 0”,0” instead of +50”,0” but ok)

- **12:53 CalPD timeline run**
  - Only received one thumbnail because it was not changed the configuration

- **13:00 FS_1 timeline short version2** (second half = start with call1 and then the observation)
  - 13:25 PD flats in the space after calibration flats
  - 13:30 Flats mode 4 (issue with no FG reset? Don’t think so but check)
  - 13:51 Started manually mode 21 because timeline was in the middle so our command was at the beginning and nobody thought of considering this
  - 14:05 SUSI not working. Timeline has to be re-started. Since it is in the middle and we are not going to receive any command either way, we left TuMag running to win the race
  - 17:3? PD taken during calibration without CWS in autolock
  - 17:39 PD flats extra

- 17:45 Flats 2.06 extra
- 18:22 Flats 1 with -150V offset extra
- 18:48 Flats 0p 14rep extra
- 19:36 PD flats extra
- 19:57 PD manually with CWS locked
- 19:57 FS_1 timeline short version2 stopped

- **20:01 SP_2 modified with both iron lines, running udp 24 manually, AR13744**
  - Prefilter scan for Mg+.02 instead of .02+.06, correct late
  - PD for Mg+.02 instead of .02+.06, correct later
  - 20:24 Flats mode 1 aborted, substituted by Flats mode 2.06
  - 20:59 Manual prefilter with udp 63: 02+06. 2.06 not finished, the abort came before finishing
  - 21:21 PD for 02+06
  - 21:26 Abort original run of science mode, restart with mode 02+06
    - Error 99: 21:27
  - FG reset after Darks

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- 00:54 Flats mode 1 aborted, substituted by Flats mode 2.06
- 01:22 Manual prefilter with udp 63: 02+06
- 01:38 SP_2 finished (w/o issues) nice evolution of AR

- **01:48 PL_2, north pole** [no voltage offset applied]
  - 02:00 FG reset after dark
  - 02:28 Pause TL for pointing to the limb

    - 02:40 Continuation of TL with science observations
    - 02:57 and 03:28 Interruption of locking
    - 04:24 Run additional flat for 3.02 upd42
    - 04:31 PL_2 finished

- 04:35 Break in the observations as we are looking through the atmosphere which leads to horrible seeing. As the data storage is reaching its limits it does not make sense to continue observing

- **08:41 SP_4, leading spot of AR13743, now close to the West limb**, no voltage offset correction.
    - Filterwheels a degree or so colder than usual
    - 08:55 SP_4 finished (3)

- 08:56 Prefilter scan 1+.02
- 09:17 Call_1 timeline started
    - 09:40 Extra flats mode 1 5 repetitions, because call_1 only included 2.02 flats
    - NOTE: During these flats there was some activity around, sometimes a pore enters the flat in the upper part. Careful with this flats, select only specific ones or discard
    - In the Mg thumbnail at the end of the calibration block, cam1 show corrupted image. Perform power cycle of cameras

- **10:04 Manual long time series running 4 hours Modes 1+.02, emerging region 210",115"**
    - Prefilter scan 1+.02 run at 10:04
    - 10:08 start real scan, go go go!
    - At some point, between 10 and 11, battery of SUNRISE started discharging (98% at 11:00 UT). Drop in temperatures seen in some TuMag parameters (cover2, DPU SSD,…) at that time, aprox. 10:12-15. Drop in temps but stable later.

    - 14:04 “timeline” stopped
    - 14:04 Prefilter scan 1+.02
    - 14:08 Mode 0p with 5 lambda repetitions at the same position of emergence
    - 14:11 Stopped

- 14:13 Call_1 timeline started
    - 14:38 flats obs 1 5 rep launched. 3 full modes and partial
- 14:47 Going to safe and switch off. Battery 21%
- 15:00 Switch back on after battery seen charging, 23%

- **15:42 AR_3,**
    - 16:45 Observation block starts
    - 17:08 CWS lost.
    - 19:24 AR_3 finished

- 19:51 Prefilter scan Mg+.02
- **19:55 Deep mode 0p with ten lambda rep. + normal 2.02**
    - 20:02 PD for 02+06

- **20:03 QS_HC special case** with 2.02 vectorial and snapshot of 2.02 at 80mA, no calibrations
    - 20:19 Loss of pointing due to gondola movement until 20:21 then continued with new lock point
    - Abort snapshots at 20:42 – should be 20 min w/o interruption in the second part
    - 20:43 End of TL

- **20:45 AR_5, Filament of AR 13743 in between the east most pores crossing N-S**
    - 22:04 Continue TL with obs block
    - 22:43 AR_5 finished

- **22:57 QSDC_2 on coronal hole**
    - 23:10 Hardware reset for FG after darks

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- 00:29 Continue observations after fine pointing including find center determination
- 00:32 Lost lock point for a minute
- 04:04 Lost Sun, gondola had a hard time to re-find it, Curtain closed, the rotation of the gondola causes a heat up of the E-unit
- 04:23 Abort currently running mode as we are only acquiring a whole lot of darks
- 04:43 Sun is back, curtain open
- 04:45 Dark thumbnail with stripes – power cycle of the cameras
- 04:47 Continue with observations
- 05:47 FG reset before PD
- 05:39 Aborted after QS5a
- Run CALL_1 block instead of CALL_2
- 06:14 QSDC_2 finished

- 6:18 Flats mode 1 5 rep
- 6:29 PD flats
- 6:34 Flats mode 0p 5 rep
- 6:48 Flats 2.06 5 rep
- 6:58 Flats 3.02 5 rep

- 7:01 Flats 5.02 5rep
- 7:04 Flats mode 1 with -150V offset

- **7:38 Manual mode 15 at the East limb sunspot.** Target of opportunity, seems there is a flare
    - Terrible seeing, wavy images
    - 7:52-7:53 CWS lost. When recovered, pointing shifted and losing the upper part of the sunspot, probably the upper flare also. Re-adjusted to a position with more limb.
    - 8:02 CWS lost again. Recovered around 8:05-06, different pointing, sunspot a bit higher hopefully still catching upper flare
    - 8:30 stopped obs
    - 8:31 PD 1+2.02 at sunspot
    - 8:33 Prefilter scan 1+2.02 at sunspot
    - 8:37 Cals at disk center

- 8:49 Test of 1+2.02 with 4 lambda repeat, for measuring time

- **9:34 EW_1 modified timeline running**
    - Flat mod 1 aborted. 09:57 Started flat mode 1 with voltage offset -150volts, for E limb.
    - 9:48 PD mode not received TM, only confirmation of last mode. But confirmed that it went through, just TM-receiving problem
    - 11:21 Continue obs block modified: Obs1 with 3 lambda rep and -150volts offset. Position at E limb around -870",310" higher than an appearing sunspot
        - First scans are a bit CWS unstable. Better from 11:22
        - 11:34 CWS lost, abort obs mode, try to re-lock
        - 11:37 Re-started and aborted in less than one scan. Waiting
        - 11:40 Re-started, aborted in less than one scan
        - 12:18 Re-started timeline so abort and run mode 1 – 3lamb and -150volts off

        - 12:33-34 CWS lost for a moment but recovered automatically same position
        - Aprox. 12:20 battery started discharging. At 12:43, batt. 97% Around the time of start discharging, curve drop in Cover_2_temp_1 [105], in Vprim,… At 13:17, battery at 90%
        - 13:27 CWS lost until aprox. 13:29-30. 13:32 Battery at 84%
        - 13:40 EW_1 Stopped, abort obs
- 13:42 Prefilter scan 1+2.02
- 14:01 Call_1 timeline running
    - 14:12 Battery at 70%
    - 14:15 Abort flats .02, flats 1 5 rep with -100volts offset run + PD flats 14:27
    - 14:34 PD 1+.02 with 40 images and USAF
    - 14:36 PD .06+Mg with USAF
- 14:39 Call_3 timeline running. We are just going to see life passing by
    - Several PDs with different targets
    - 15:00 Aborted
- 15:02 Closure of the curtain

15:05 Switch off of instruments