1 General Comments

Activities scheduled for this week are those planned for the 10th calendar week of 2018:

05 MAR 2018 to 12 MAR 2018 (DOYs 064 to 071).

The following routine activities were planned this week (see Gantt chart on next page and CRF 722).

- One Warm NIR Calibration on 07 MAR 2018 (DOY 066) with ETO 04:06:19z (orbit 43845; DESCENDING : thermally UNSTABLE) and with the following expected calibration values:

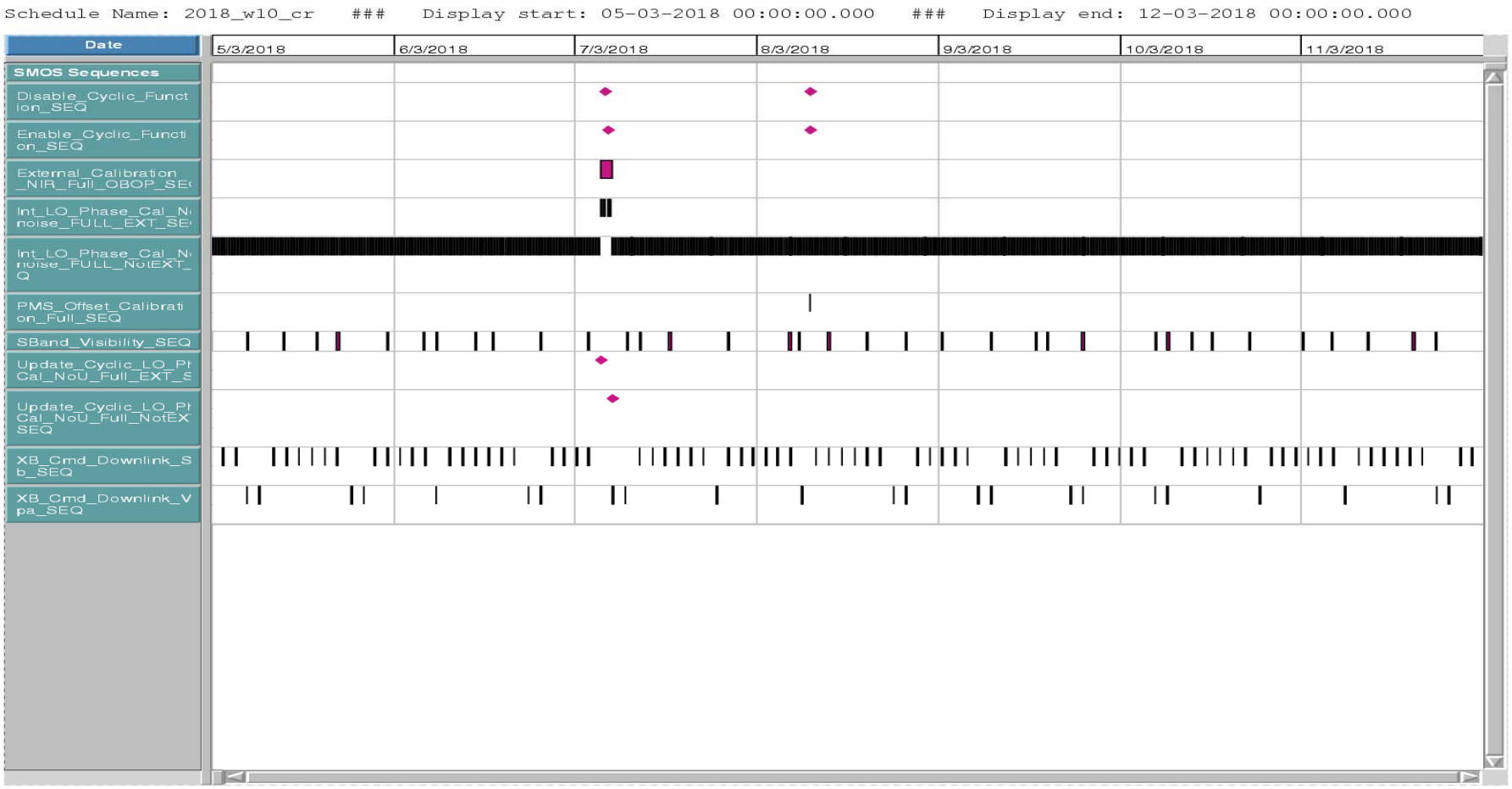
```
B.T.            =     3.76º
R.M.S.          =     0.15
Sun elevation   =     9.99º
Moon elevation  =   -39.32º
R.A.            =    68.92º
DEC.            =   -35.20º
```

- One PMS Offset on 08 MAR 2018 (DOY 067), including three Short Calibrations at 07:00:30.0z, 07:01:04.8z, and 07:01:39.6z (orbit 43861).
- Local Oscillator Calibrations every 10 minutes.
- *X* band Passes over ESAC and Svalbard.

2 Mission Planning Deviations

Due to the CCU reset that took place on the 9th of March 2018, the following X-Band passes were not acquired at ground station level (further details can be found in section 4 of this document):

Station	AOS	LOS	Duration
ESAC	2018-03-08T19:42:39	2018-03-08T19:48:57	377
SVAL	2018-03-08T21:09:32	2018-03-08T21:19:53	621
SVAL	2018-03-08T22:48:18	2018-03-08T22:58:34	615
SVAL	2018-03-09T00:26:57	2018-03-09T00:37:18	620
SVAL	2018-03-09T02:05:49	2018-03-09T02:16:17	627
SVAL	2018-03-09T03:45:16	2018-03-09T03:55:31	614
ESAC	2018-03-09T06:56:57	2018-03-09T07:02:07	309
SVAL	2018-03-09T08:49:14	2018-03-09T08:54:36	321
SVAL	2018-03-09T10:31:40	2018-03-09T10:35:15	215
SVAL	2018-03-09T12:12:58	2018-03-09T12:17:13	254
SVAL	2018-03-09T13:53:12	2018-03-09T13:59:43	391


Schedule Name: 2018_w10_cr ### Display start: 05-03-2018 00:00:00.000 ### Display end: 12-03-2018 00:00:00.000
Date
5/3/2018
6/3/2018
7/3/2018
8/3/2018
9/3/2018
10/3/2018
11/3/2018
SMOS Sequences
Disable_Cyclic_Function_SEQ
Enable_Cyclic_Function_SEQ
External_Calibration_NIR_Full_OBOP_SE
Int_LO_Phase_Cal_Noise_FULL_EXT_SE
Int_LO_Phase_Cal_Noise_FULL_NotEXT_Q
PMS_Offset_Calibration_Full_SEQ
SBand_Visibility_SEQ
Update_Cyclic_LO_PhCal_NoU_Full_EXT_S
Update_Cyclic_LO_PhCal_NoU_Full_NotEXSEQ
XB_Cmd_Downlink_Sb_SEQ
XB_Cmd_Downlink_Vpa_SEQ

3 TC Failures

None.

4 On Board Anomalies

- The MIRAS instrument CCU unit, reset on 2018-03-08T16:12:56.556z (DOY 067). First suspicious of the reset were noticed by the DPGS on shift engineer that verified that the number of TM packets received for the Svalbard pass with AOS at 16:11:46z, were significantly less than the ones expected for that pass. The CCU reset was finally confirmed around 20:30z by a phone call from CNES to FOS and upon reception of the S-band pass (ASX-7, AOS=19:38:30z, LOS=19:51:13z). Few minutes later, around 20:45z, FOS oncall engineer contacted KSAT operator informing them that no X-band passes would be received until the following day at 15:30z. The last TM packet received before the reset was time stamped at 2018-03-08T16:12:56.556z. As detailed on the instrument boot report packet, issued immediately after the reset, the cause of the anomaly was, as in all previous cases, a Task Overrun error. After the usual onboard events at the start of the pass:

  2018.067.16.12.05.845 725 NORM XBand Powered On
  2018.067.16.12.29.845 695 NORM MM Full Dump Start

  the following Alarm packets were issued by the instrument:

On board time	ID	Severity	Packet Description
2018.067.16.12.56.246	*690*	*ALARM*	*MM_Scrub_Frequency_Acquisition_Failure*
2018.067.16.12.56.286	*684*	*ALARM*	*MM_Address_Acquistion_Failure*
2018.067.16.12.56.356	*692*	*ALARM*	*MM_Science_Write_Failure*
2018.067.16.12.56.456	*692*	*ALARM*	*MM_Science_Write_Failure*
2018.067.16.12.56.556	*692*	*ALARM*	*MM_Science_Write_Failure*

  and then immediately after the reset took place. As it happened in previous few occasions, the on board reset took a little bit longer than usual and for few seconds the instrument was out of time sync with the PROTEUS platform. As result of that, the following two error TM packets with an incorrect time stamp were received from the instrument:

On board time	ID	Severity	Packet Description
2018.067.20.12.30.975	*652*	*ERROR*	*Time_Correlator_Unexpected_UTC*
2018.067.20.12.30.975	*653*	*ERROR*	*Time_Correlator_Unexpected_PPS*

Immediately after, the instrument became synchronised with the platform and MIRAS TM packets were stamped with the correct time correlation. MIRAS re-planning was prepared by FOS in the morning of the 9th of March and included as part of CRF No. 726. That replanning together with the CCU recovery procedure, was uploaded by CNES using two S-Band passes (KER -5, AOS= 12:45:36z, LOS=13:00:28z) and (HBX-6, AOS= 14:22:55z, LOS=14:33:35z). As per this re-planning, nominal MIRAS X band GS dumps were resumed at, 2018-03-09T15:33:18z (Svalbard XBand pass). Due to the fact that the instrument recovery was performed 11.6 after the reset, the faulty chip 6 of MM partition P3 was overwritten and some science data got corrupted. As result of the reset and since the anomaly happened at the start of an X-Band pass 6045 seconds of data got lost, from 2018-03-09T14:32:45z to 2018-03-09T16:13:30z.

- The MIRAS instrument CMN, unit C3, unlocked on 2018-03-07T10:41:35.629z (DOY 066). This anomaly was geolocated over the north west coast of Australia:

  Latitude = -17.47°
  Longitude = 107.23°

  Only locking status SPM22167, went out of limits in the FOS PLPC system. The anomaly recovered by itself after in 2 Epochs.

- The MIRAS instrument MM, partition P1, latched up on 2018-03-06T21:51:47.154z (DOY 065). The following parameters went out of limits in the PLPC system:

  2018.065.21.51.47.154z DMASME11 LU Switch P1
  2018.065.21.51.47.154z DMASME37 SDD LU Detected

  This anomaly was geolocated over the Antarctic ocean between the coast of Australia and Antarctic continent :

  Latitude = -51.24°
  Longitude = 132.94°

  There were no science data losses associated with this anomaly because it affected partition P1, while the Read and Write pointers were in partitions P4 and P5 respectively. Recovery was planned to take place on 9th March 2018, at 13:30:00z (CRF No. 724). At the time of the anomaly the position of the MM pointers were as follows:

  READ = 2139466 (partition P4)
  WRITE = 2300770 (partition P5)

5 On Board Events Telemetry

At the time of the MIRAS CCU reset on the 9th of March, the following MIRAS Alarm and Error packets were received on the PLPC system:

Event Description	Packet ID	Severity	Event Time	Parameters
MM_Scrub_Frequency_Acquisition_Failure	690	ALARM	2018-03-08T16:12:56	No
MM_Address_Acquistion_Failure	684	ALARM	2018-03-08T16:12:56	No
MM_Science_Write_Failure	692	ALARM	2018-03-08T16:12:56	Link
MM_Science_Write_Failure	692	ALARM	2018-03-08T16:12:56	Link
MM_Science_Write_Failure	692	ALARM	2018-03-08T16:12:56	Link
Time_Correlator_Unexpected_UTC	652	ERROR	2018-03-08T20:12:30	PPS
Time_Correlator_Unexpected_PPS	653	ERROR	2018-03-08T20:12:30	Idle

The following RAM Single Bit errors befell this week:

Event Description	Packet ID	Severity	Event Time	Parameters
RAM single Bit Error	730	WARN	2018-03-08T20:12:30	217444C

6 FOS Systems Status

- In order to remove the SPGF conflict resolution constraint for the Long Calibration observations, the *FlexPlan* MEP database was modified in all SPGF machines at the same time.
- In preparation for the power outage that will take place on the 16th of March, a test exercise was performed on the 7th of March between 10:30z and 11:30z. The test and the real exercise consist to power down the redundant power unit of the SMOS communication rack in order to reconnect a new UPS unit to that line. The test on the 7th of March was successfully executed and CNES could connect without any problem to the FOS machines. Also DPGS connectivity with the outside world went fine.

7 Data Reception from CNES

All *S* band passes were correctly received from CNES and successfully processed by the FOS PLPC system.

8 *X* Band Data Reception in PXMF

None, all *S* band passes successfully received and processed.

9 Exceptional Activities

- In preparation for the changes on the CCU recovery procedure, where every OBOP patched will have a single TC_GROUP, an upload and checksum test on the new TC_GROUPS was performed

on the 7 of March 2018. The test was specified in CRF 723 and the following TC_groups uploaded:

SMO_TC_PLPC_PUS_TC_589_2018_03_01_09_36_21 for OBOP 29 version 2
SMO_TC_PLPC_PUS_TC_590_2018_03_01_09_39_47 for OBOP 28 version 2
SMO_TC_PLPC_PUS_TC_591_2018_03_01_09_42_34 for OBOP 16 version 3
SMO_TC_PLPC_PUS_TC_592_2018_03_01_09_47_48 for OBOP 15 version 3
SMO_TC_PLPC_PUS_TC_593_2018_03_01_09_53_30 for OBOP 42 version 2

Following that upload the next TC groups were uploaded to perform the checksum of each individual OBOP:

SMO_TC_MANUAL_PLPC_PUS_TC_733_2018_02_01_14_26_06, OBOP 29
SMO_TC_MANUAL_PLPC_PUS_TC_732_2018_02_01_14_23_45, OBOP 28
SMO_TC_MANUAL_PLPC_PUS_TC_731_2018_02_01_14_19_27, OBOP 16
SMO_TC_MANUAL_PLPC_PUS_TC_730_2018_02_01_14_11_58, OBOP 15
SMO_TC_MANUAL_PLPC_PUS_TC_734_2018_02_01_14_31_24, OBOP 42

Checksum results were the expected ones and here below included:

Checksum OBOP 29= 3558, (x3558)
Checksum OBOP 28= 55007, (xD6DF)
Checksum OBOP 16=10863, (x2A6F)
Checksum OBOP 15= 26612, (x67F4)
Checksum OBOP 42= 55031, (xD6F7)

- Due to the CCU reset on the 9th of March, a dedicated CRF number 726 containing the replanning for weeks 10 and 11 was prepared by FOS and sent to CNES for its further upload.

10 AOB

None.

APPENDIX A: OOLs

During the execution of the MIRAS CCU recovery procedure, the following temporal and expected OOL was received on the FOS PLPC system indicating that the MIRAS ITL became disable:

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2018-03-09T14:49:26	2018-03-09T12:47:53	NTLHK022	ITL Ena State	Disabled	Enabled

At the time of the MIRAS CCU reset the following MIRAS TM parameters went out of limits on the FOS PLPC system. It is worth to mention that due to the PPS Error flag and the fact that the instrument was not synchronised with the platform for few seconds, the onboard time for these parameters was not well correlated and that time appear the same as the ground reception time.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2018-03-08T20:12:31	2018-03-08T16:13:31	TCO_FLAG	TCO Restart flag	NOT-OK	OK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM22167	C3 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM21167	C2 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM20167	C1 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM19167	B3 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM18167	B2 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM17167	B1 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM16167	A3 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM15167	A2 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM14167	A1 LO_Locking	UNLOCK	LOCK

2018-03-08T20:12:31	2018-03-08T20:12:30	SPM13167	H3 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM12172	H2 LO_locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPM11167	H1 LO_Locking	UNLOCK	LOCK
2018-03-08T20:12:31	2018-03-08T20:12:30	SPC10107	PPS_ERROR_FLAG	Unexp PPS	valid
2018-03-08T20:12:31	2018-03-08T20:12:30	SPC02106	Instrument_Mode	Inst Init	Any
2018-03-08T20:12:31	2018-03-08T20:12:30	XNIRABST	NIR AB VALID ST	NOT-OK	OK
2018-03-08T20:12:31	2018-03-08T20:12:30	XNIRBCST	NIR BC VALID ST	NOT-OK	OK
2018-03-08T20:12:31	2018-03-08T20:12:30	XNIRCAST	NIR CA VALID ST	NOT-OK	OK

At the time of the CMN unlock on the 7th of March, the following TM parameter went temporary out of limits on the FOS PLPC system.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2018-03-07T13:03:35	2018-03-07T10:41:35	SPM22167	C3 LO_Locking	UNLOCK	LOCK

The following two MIRAS TM parameters went out of limits on the PLPC system at the time of the MM latch up that happened on the 6th of March.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2018-03-07T02:17:25	2018-03-06T21:51:47	DMASME37	SDD LU Detected	FALSE	TRUE
2018-03-07T02:17:25	2018-03-06T21:51:47	DMASME11	LU Switch P1	OFF	ON