1 General Comments

Activities scheduled for this week are those planned for the 43rd calendar week of 2015:

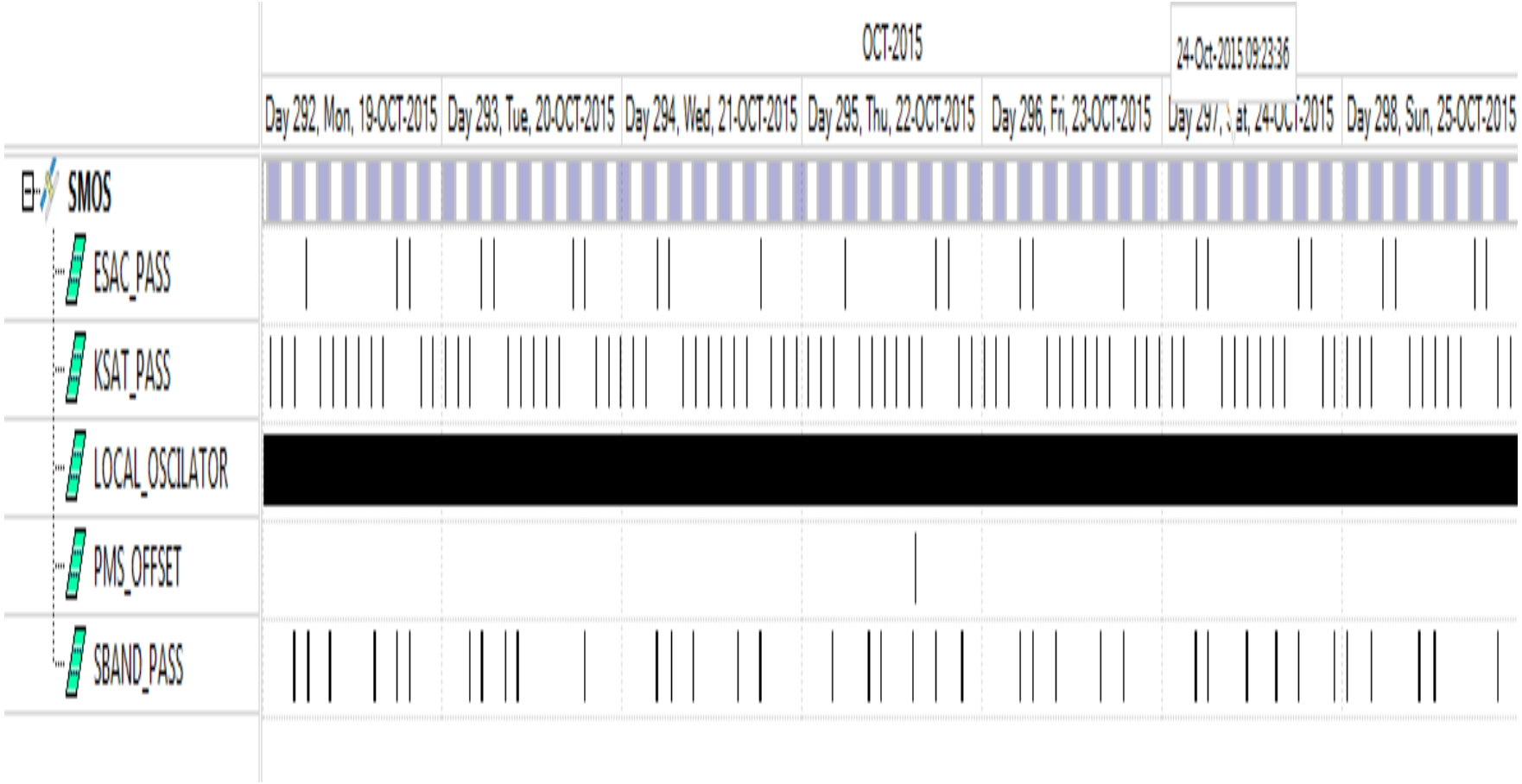
19 OCT 2015 to 26 OCT 2015 (DoYs 292 to 299).

The following routine activities were planned this week (see Gantt chart on next page and CRF 530):

- One PMS Offset on 22 OCT 2015 (DoY 295), including three Short Calibrations at 15:08:00.0z, 15:53:34.8z, and 15:54:09.6z (orbit 31376).
- Local Oscillator Calibrations every 10 minutes.
- *X* band Passes over ESAC and Svalbard.

2 Mission Planning Deviations

None.


OCT-2015
24-Oct-2015 09:23:36
Day 292, Mon, 19-OCT-2015
Day 293, Tue, 20-OCT-2015
Day 294, Wed, 21-OCT-2015
Day 295, Thu, 22-OCT-2015
Day 296, Fri, 23-OCT-2015
Day 298, Sun, 25-OCT-2015
SMOS
ESAC_PASS
KSAT_PASS
LOCAL_OSCILATOR
PMS_OFFSET
SBAND_PASS

3 TC Failures

None.

4 Unforeseen Out of Limits (OOLs)

Two Out of Limits in parameters DMASME01 and DMASME37 were received at the time of the Mass Memory latch up problem (See Appendix-A for further details)

5 On Board Anomalies

- A new Mass Memory Latch up in partition P11 happened on 2015-10-19T04:29:46.393z. This event was geolocated over the Artic Regions with the following coordinates:

  Longitude=3.287303
  Latitude=65.895150

  No science data should have been affected by this event since the latch up happened for a partition not used in operations but due to a unknown problem some data was lost. (see event below)) The recovery took place via CRF No. 531 on 2015-10-19T15:30:00z
- During the Mass Memory latch up that happened on 19 OCT 2015, at 04:29:46z, a strange behaviour on MIRAS instrument was noticed since the instrument was not generating and downloading any science telemetry for around 8 minutes and half. This has not been seen before and in that sense can be considered a new type of MIRAS anomaly.

  The MM latch-up happened in partition P11 few seconds after the start of a XBand pass over Svalbard at 04:29z. At the time the latch-up happened, the instrument stop generating and writing science telemetry on the Mass Memory and it only resumed nominal "science writing" operations at the end of the pass. Here below there is have a detail sequence of events:

  2015-10-19T04:29:12z Switch on of XBand transmitter
  2015-10-19T04:29:35z Start of data download
  2015-10-19T04:29:46z Latch up of MM partition P11.
  2015-10-19T04:29:46z The instrument stops writing/reading science telemetry, although the MM Write pointer still show increasing "nominal" values.
  2015-10-19T04:38:23z The instrument stop sending Xband data.
  2015-10-19T04:38:24z The instrument rejoins science telemetry writing.

2015-10-19T04:38:26z SDD LU Detected parameter, goes Out of limits (this is not normal since this parameter normally goes out of limits at the same time that the MM LU alarm)
2015-10-19T04:38:45z XBand transmitter went off

During the affected XBand pass, it was seen that the instrument only downloaded 38691 packets clearly less than normal (normal numbers are higher than 840.000). This corresponds with the time when the transmitter was really sending telemetry to ground i.e. from 04:29:35 to 04:29;46z. The data gap produced by this anomaly went from 04:29:46z to 04:38:24z i.e 8 minutes and 38 seconds. As clearly symptom of this anomaly, it was also seen that the read pointer that is always updated by the OBSW at the end of each pass, it did not update this time.. This parameter indicates to the OBSW what should be the first address to be read/download at the start of the following pass, to be more precise, the instrument always start downloading data from that position minus the current overlap to the current write position at the start of the pass.

At the following XBand pass over ESAC at 05:58z, we saw that the instrument in fact downloaded much more packets in order to compensate what it was not written/read during the previous pass and 1073196 packets were received that time. Looking at L0 processor level, DPGS team has seen that during the previous pass and at the time when the instrument was not written/reading data, the instrument downloaded data from the day before from 02:17:32z to 02:26:07z i.e around 26 hours less which is the time required to overwrite the mass memory. Then what clearly happened at the time of the MM Latch up and while the XBand pass was executed was:

1. The instrument stopped writing and reading telemetry (the write pointer was running but not in reality)
2. At the time the pass finished, the instrument started again to write data into the MM but starting from the latest Write position.
3. Between these two previous times nothing was written in such a way that the old data from the previous date remained untouched.
4. During the following pass the instrument downloaded the data available on the MM which contained past data from the day before. It is important that no warning or alarm packet was

received during that period of time i.e "apparently" the instrument behaved nominally.

The problem could be related with two main factors:

1. The anomaly happened in the last and non-used partition i.e. P11.
2. The latch-up happened during an XBand pass.
3. During the pass there was a wraparound on the read pointer, i.e. the pass start downloading data from the last partition P8 and then continue with P0 and P1.

The ingestion of the XBand files show similar results:

1. The affected pass it only contained data from 22:58:14z to 23;13:23z.
2. The following pass over ESAC contained old data from the day before from 2015.291.02.17.32 to 2015.02.26.07
3. One more thing to be noticed is the fact that in XBand channel both out of limits are received at the same time as it should be and this was not seen in SBand.
4. The temperature of the transmitter was higher than usual since the whole scheduled duration of the pass was in reality used. (see attached file)

An ARB telecom on this anomaly was held on the 23rd of October, as result of this and in order to check if any OBSW problem might happened, a download of the RAM Context area will be required on the 26th of October.

6 On Board Events Telemetry

The following RAM Single Bit Errors befell this week:

Event Description	Severity	Event Time	Parameters
RAM single Bit Error	WARN	2015.293.21.37.50.755	227341C
RAM single Bit Error	WARN	2015.291.22.44.37.090	21DDD7C

7 FOS Systems Status

All FOS Systems behaved nominally with the following exception:

- The PLPC Time Correlation task crashed on 2015-10-19T09:39:45.451z (Earth Reception Time), during the reception of TM for GS pass KRU-2 (GS pass from 09:06:10.096z to

09:21:41.922z). At the time of the anomaly the following error messages were issued by SCOS-PLPC system:

"SYSTEM CORBA::SystemException caught"

The problem was detected by the FOS Team around 2015-10-19T09:40z and procedure FCP-GRD-040 then executed. As part of this execution several attempts were made to have the TCO task restarted, unsuccessfully. Eventually the PLPC system was allowed to finish ingesting as best as it could, then restarted. The problem did not have any impact at MUST-SMTA level since no incorrectly tagged TM data had been transferred to the system. Nevertheless MUST data transfer *cronjobs* were disabled until the end of the PLPC cleanup procedure. HFA files were deleted for both Data Streams 1 and 4 from 2015.292.06.16.22.000z (generation time) onwards.
The following TM file was again reingested: SMOS_PLTM1_P_2015_10_19_09_07_17

8 Data Reception from CNES

All *S* Band Passes were correctly received from CNES and successfully processed by the FOS PLPC System, with the following exceptions:

9 *X* Band Data Reception in PXMF

None, all *S* Band Passes successfully received and processed.

10 Exceptional Activities

None.

11 AOB

None.

APPENDIX A: OOLs

The following two OOLs were received at the time of the Mass Memory latch up anomaly in partition P11. It is worth to mention, that in nominal conditions the two OOL should have received simultaneously but due to the anomaly reported in section 5 these two OOLs were received separately.

GS_TIME	OBTIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2015.292.06.44.47.270	2015.292.04.29.46.393	DMASME01	LU Switch P11	NOT-OK	O.K
2015.292.06.45.14.560	2015.292.04.38.26.001	DMASME37	SDD LU Detected	TRUE	FALSE