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**Title** : IDEAS+ – SMOS Public Monthly Report - April 2016

**Abstract** : This document provides a summary of the status and performance of SMOS over the course of the reporting month.

**Author** : IDEAS SMOS QC Team      **Accepted** : R. Crapolicchio on behalf of  
ESA EOP-GMQ

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**Telespazio Vega UK Ltd.**  
**350 Capability Green, Luton, Bedfordshire, LU1 3LU, United Kingdom**  
**Tel: +44 (0)1582 399 000 Fax: +44 (0)1582 728 686**  
**www.vegaspaces.com**



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## **AMENDMENT POLICY**

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

### **AMENDMENT RECORD SHEET**

<b>ISSUE</b>	<b>DATE</b>	<b>DCI No</b>	<b>REASON</b>
1	20 May 2016	N/A	First release



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## **1. EXECUTIVE SUMMARY**

This is the routine Soil Moisture and Ocean Salinity (**SMOS**) Monthly Public Report containing a summary of the instrument health, product quality status and updates to SMOS processing and AUX files during April 2016.

The instrument health during April was found to be nominal. There were six unavailabilities reported during the reporting period that translate into time intervals with data loss. The list of unavailabilities is included in the section 3.2.

The data quality during April was found to be nominal, with the exceptions listed in section 4.5. These degraded periods have been induced either by instrument anomalies or unavailability of dynamic auxiliary files.



## 2. INTRODUCTION

### 2.1 Structure of the Document

After this introduction, the document is divided into a number of major sections that are briefly described below:

1        Executive summary

The executive summary covers the main findings from the report.

2        Introduction

A list of referenced documents and definitions of terms are available.

3        Instrument status

This section covers the instrument health and unavailabilities from this reporting period.

4        Data Summary

This section covers reprocessing, updates to processors and aux files as well as a data coverage summary.

5        Long Term Analysis

Long-term analysis of the instrument calibration and data quality are provided in this section.

### 2.2 Definitions of Terms

The following terms have been used in this report with the meanings shown.

Term	Definition
CMN	Control and Monitoring Node, responsible for commanding the receivers, reading their physical temperatures and telemetry and the generation of the synchronization signal (local oscillator tone) among receivers.
CCU	Correlator and Control unit, instrument computer on-board
DPGS	Data Processing Ground Segment
ESL	Expert Science Laboratory
IC4EC	Internal Calibration for External calibration. Calibration sequences for the instrument monitoring and calibration of science data acquired in external target pointing.
IDEAS+	Instrument Data quality Evaluation and Analysis Service, reporting to the ESA Data Quality and Algorithms



Management Office (EOP-GQ), responsible for quality of data provided to users including the data calibration and validation, the data processing algorithms, and the routine instrument and processing chain performances.

IPF	Instrument Processor Facility
L2SM	Level 2 Soil Moisture
MM	Mass Memory
OCM	Orbit Correction Manoeuvre
PMS	Power Measurement System
RFI	Radio Frequency Interference
N/A	Not applicable



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### 3. INSTRUMENT STATUS

#### 3.1 Instrument health

The current instrument status is that all the **instrument** subsystems are working correctly. The current configuration of the instrument is that the arm A and the arm B are working in nominal side and arm C is in the redundant side.

**Table 3-1 History of instrument problems and mode changes**

Start	Stop	Description
11 January 2010 12:07z Orbit 1013	N/A	Arm A changes from redundant to nominal side. That operation is to avoid the malfunction of one of the redundant CMNs of the arm.
12 January 2011 09:15z Orbit 6278	N/A	Arm B changes from redundant to nominal side. That operation is to avoid the malfunction of one of the redundant CMNs of the arm.

#### 3.2 Instrument unavailabilities and anomalies

The unavailabilities and anomalies listed in Table 3-2 occurred during the reporting period. A full list of unavailabilities can be found in the Mission Status section on the SMOS Earthnet website accessible [here](#)

During these unavailabilities and anomalies the instrument may have either not collected data or may have collected corrupt data which may not have been processed to higher levels. Table 4-5, Table 4-6 and Table 4-7 provide details of the data which has been affected by gaps and quality degradation respectively.

**Table 3-2 SMOS unavailability list**

Start Time	Stop Time	Unavailability Report Reference	Planned	Description
01/04/2016 14:14	01/04/2016 14:17	FOS-1319	No	CCU Reset
06/04/2016 20:07	06/04/2016 20:17	FOS-1332	No	CMN Unlock
20/04/2016 15:20	20/04/2016 15:30	FOS-1335	No	CMN Unlock



25/04/2016 11:29	25/04/2016 11:29	FOS-1365	No	MM Latch-Up
25/04/2016 15:56	25/04/2016 17:02	FOS-1366	No	CCU Reset
27/04/2016 22:56	27/04/2016 22:56	FOS-1371	No	MM Latch-Up



## 4. DATA SUMMARY

### 4.1 Reprocessing activities

The information regarding to data reprocessing activities (REPR data type) during the reporting period are:

- 1) None

The information regarding to the data regeneration activities (OPER data type) during the reporting period are:

- 1) None

The information regarding to past version 62x data reprocessing activities (REPR data type) are:

- 1) Level 2 sea surface salinity and soil moisture reprocessing finished the 31<sup>st</sup> December 2015. The reprocessed dataset has been delivered to the user on 4 March 2016. Sensing time of the reprocessed data goes from 12<sup>th</sup> January 2010 to 14<sup>th</sup> July 2015. For more details see the SMOS news [here](#). The SMOS users are strongly encouraged to consult the level 2 read-me-first notes before using the SMOS data. The level 2 read-me-first note for sea surface salinity product is available [here](#), the level 2 read-me-first note for soil moisture product is available [here](#).
- 2) The second SMOS mission reprocessing for L1 v62x finished the 25<sup>th</sup> June 2015. Sensing time of the reprocessed data goes from 12<sup>th</sup> January 2010 to 05<sup>th</sup> May 2015. Data set is available for the SMOS user community since 25<sup>th</sup> June 2015 (see the SMOS news [here](#)). The SMOS data users are strongly encouraged to consult the level 1 read-me-first note before using the SMOS data. The level 1 read-me-first note is available [here](https://earth.esa.int/documents/10174/1854503/SMOS_L1OPv620_release_note): [https://earth.esa.int/documents/10174/1854503/SMOS\\_L1OPv620\\_release\\_note](https://earth.esa.int/documents/10174/1854503/SMOS_L1OPv620_release_note)

The information regarding to the past version V62x data regeneration activities (OPER data type) are:

- 1) On December 2015, the next periods were regenerated from L1C to L2 due to VTEC\_P delay: the period from 20151206T005504 to 20151206T041830 and the period from 20150719T005448 to 20150720T024908.
- 2) On 15<sup>th</sup> of August 2015 a hardware anomaly caused a TLM\_MIRA1A order to fail due to timeout. Therefore, a gap in science and in calibration (CSTD1A) was introduced. The next data types and periods has been regenerated: TLM\_MIRA1A at 20150815T031323, CSTD1A files with times between 20150815T003625 and 20150815T214626, affected science (MIR\_SC\_F1A, MIR\_SC\_F1B, MIR\_SCLF1C, MIR\_SCSF1C, MIR\_BWLF1C and MIR\_BWSF1C) between 20150815T023400 and 20150815T050753.
- 3) Due to an anomaly in the NIR calibration on the 3<sup>rd</sup> of June 2015, the next data types has been regenerated from 2015-06-03 06:43z to 2015-06-12 08:14z: MIR\_SC\_F1A, MIR\_SC\_F1B, MIR\_SCLF1C, MIR\_SCSF1C, MIR\_BWLF1C and MIR\_BWSF1C.
- 4) A hardware anomaly in DPGS systems introduced a large delay in the production. As a consequence some CSTD1A orders were dropped due time-out. This introduced bad-consolidated calibration in the system, with some LO gaps, which has impacted the quality of the data severely (no local oscillator calibration). Data from



20150713T194909z until 20150714T032238z is affected. All data was regenerated successfully from L0 up to L1C; L2 data was reprocessed and now available as REPR data type.

- 5) Period from 29 May 2015 to 31 May 2015 have been regenerated since one of the DPGS processing nodes (PWF-5) induced several science and calibration gaps for the reported period. L2 data was reprocessed and now available as REPR data type

The information regarding the past version V5xx data regeneration and reprocessing activities (OPER and REPR data type) are available in the monthly report of April 2015.

## 4.2 Processing changes

### 4.2.1 Processor updates

No processor updates have been conducted during the reporting period.

### 4.2.2 Processor Status

At the end of the reporting period, the Processing Facility is using the following processors:

**Table 4-1 Instrument Processors status**

Processor	Version
L1OP	620 (L1a/L1c/NIRCAL) 621 (L1b/CAL_1A)
L2OS	622
L2SM	620

**Table 4-2 Pre- and Post-processors status**

Processor	Version
ECMWFP	318
VTECGN	311
LAI pre-processor	307
OSCOTT	624
L2 Post-processors	510



### 4.2.3 Schema updates

No schema changes have been conducted during the reporting period.

### 4.2.4 Schema status

At the end of the reporting period, the schema version of the datablock of the products generated and distributed through SMOS dissemination service is:

**Table 4-3 Schema version status**

Product type	Version
MIR_SC_F1B	400
MIR_SCSF1C	400
MIR_SCLF1C	400
MIR_BWSF1C	400
MIR_BWLF1C	400
MIR_SMUDP2	400
MIR_OSUDP2	400
AUX_ECMWF_	300

The schema packages are available from the SMOS Global Mapping Tool (GMT) webpage:

[https://earth.esa.int/web/guest/software-tools/-/asset\\_publisher/P2xs/content/gmt-smos-global-mapping-tool](https://earth.esa.int/web/guest/software-tools/-/asset_publisher/P2xs/content/gmt-smos-global-mapping-tool)

Further information about the product format is available in the level 1 and level 2 Product specification documents available [here](#)

### 4.2.5 Aux file updates

The following quasi-static AUX files were disseminated to the processing stations this reporting period. The status of the quasi-static AUX files at the end of the reporting period is in the section 7.

**SM\_OPER\_AUX\_BULL\_B\_20160202T000000\_20160301T235959\_120\_001\_3**

Start sensing time at L1 processor: N/A

Justification: Bulletin Update including values from February 2016 and the prediction for March 2016. Its usage is intended for reprocessing.

**SM\_OPER\_AUX\_BULL\_B\_20160202T000000\_20500101T000000\_120\_001\_3**



Start sensing time at L1 processor: 2016-04-04 10:34:33z

Justification: Bulletin Update including values from February 2016 and the prediction for March 2016. Its usage is intended for the nominal production.

### 4.3 Calibration Events Summary

The following table summarizes the major calibration activities conducted during the reporting period. The Local Oscillator calibration is not included in the table since occurs periodically every 10 minutes. The short calibrations are acquired weekly since 2011-03-24 and they are currently used in the nominal processing chain.

**Table 4-4 Calibration summary**

Date	Start Time	Stop Time	Calibration	Comments
06/04/2016	00:47:31z	02:09:44z	NIR-Warm	<p>FAILED the SPQC checks due to <math>Tp7 &lt; 0</math>. This is expected because the proximity of the equinox.</p> <p>Brightness temperature: 3.8775 K RMS: 0.6017 K Moon Elevation: -14.5612 Sun Elevation: 1.167118 Right Ascension: 101.76 Declination: -18.26</p>
07/04/2016	11:08:00z	11:09:44z	Short	Nominal
14/04/2016	18:18:00z	18:19:44z	Short	Nominal
20/04/2016	04:46:07z	06:08:20z	NIR-Warm	<p>FAILED the SPQC checks due to <math>Tp7 &lt; 0</math>. This is expected because the proximity of the equinox.</p> <p>Brightness temperature: 3.6923 K RMS: 0.3971 K Moon Elevation: 17.9052 Sun Elevation: 1.913486 Right Ascension: 125.81 Declination: 40.88</p>
21/04/2016	10:23:00z	10:24:44z	Short	Nominal
28/04/2016	17:31:00z	17:32:44z	Short	Nominal

### 4.4 Data Coverage Summary

Where instrument unavailabilities or anomalies have occurred during this reporting period, gaps in data coverage may have occurred. A list of the gaps due to a permanent



data loss is given in Table 4-5 by product level. On the other hand, a list of gaps due to operational problems is given in Table 4-6. The latter gaps may be recovered when the problem is fixed.

The science data gaps due to the execution of calibration activities are not listed in this section.

**Table 4-5 Data loss summary**

Start	Finish	Data Level	Comments
01/04/2016 14:14z	01/04/2016 14:17z	All Products	CCU Reset (FOS-1319)
25/04/2016 15:56	01/04/2016 17:02z	All Products	CCU Reset (FOS-1366)

**Table 4-6 Operational gaps summary**

Start	Finish	Data Level	Comments
N/A	N/A	N/A	N/A

## 4.5 Summary of degraded data

In April 2016, SMOS data was affected by the following instrument and processing anomalies which have had a detrimental effect on the data quality.

**Table 4-7 Summary of degraded data**

Start	Finish	Affected products	Problem Description
06/04/2016 20:07	06/04/2016 20:17	L1a and above products.	CMN Unlock
20/04/2016 15:20	20/04/2016 15:30	L1a and above products.	CMN Unlock

## 4.6 Product Quality Disclaimers

The following product disclaimers affects the data generated in the reporting period:

**Table 4-8 Summary of product quality disclaimers**

Date	Product	
------	---------	--



	level	
N/A	L1 L2	Due to a software anomaly in the Level 0 processor, the <i>Cycle</i> , <i>orbit relative</i> and <i>orbit absolute</i> fields in all the product headers are incorrectly set. Those values are annotated in the headers of all the higher level products.





## **5. LONG-TERM ANALYSIS**

### **5.1 Calibration Analysis**

The calibration parameters are under monitoring. During the reporting period, there have been two Warm-NIR calibrations events: on 6<sup>th</sup> and 20<sup>th</sup> of April 2016.

Both NIR calibrations on 6<sup>th</sup> and 20<sup>th</sup> of April failed the SPQC checks due to Tp7 below 0K, this is expected because of the proximity of the equinox. The NIR calibration events have been monitored and the noise injection levels of the NIR diodes are stable and inside the range defined in the routine calibration plan.

The evolution of the noise temperature of the reference noise diodes Tna and Tnr computed with processor baseline V62x since the beginning of the mission is shown from Figure 1 to Figure 4. The evolution of the temperature parameters, which are related to the internal diode stability, are stable in particular for the NIR CA which is the only one used for the level 1 data calibration. The small deviation in the NIR calibration on 3<sup>rd</sup> June 2015 was due to a Radio Frequency Interference (RFI) that has corrupted the measurement. This calibration should not be used for the scientific processing of the data.

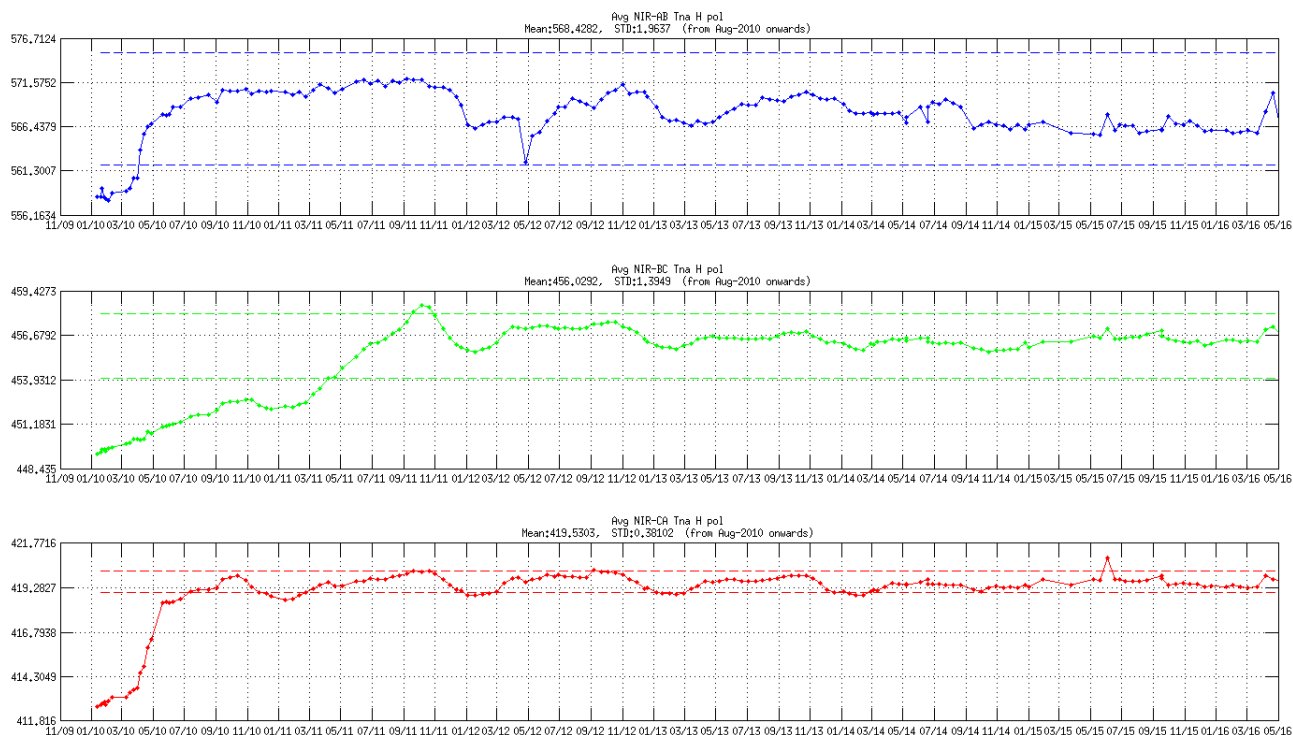
Figure 5 and Figure 6 present the evolution of the NIR Observed brightness temperature (BT) since the beginning of the mission for the V620x baseline. Small variation of few Kelvin, in the observed BT are due to slightly different region of the Sky sensed during the calibration manoeuvre. This parameter is used only for monitoring purpose.

The seasonal evolution of the calibration parameters present in the previous processor baseline V5xx (see the previous monthly report for April 2015) had been largely mitigated by the new calibration algorithm which decouple the variation of the antenna losses and the drift of the reference diode. This approach allows to compensate each drift separately improving the diode stability monitoring and increasing the accuracy of the consequent calibration correction. The impact on the final brightness temperature is a more stable long term measurement.

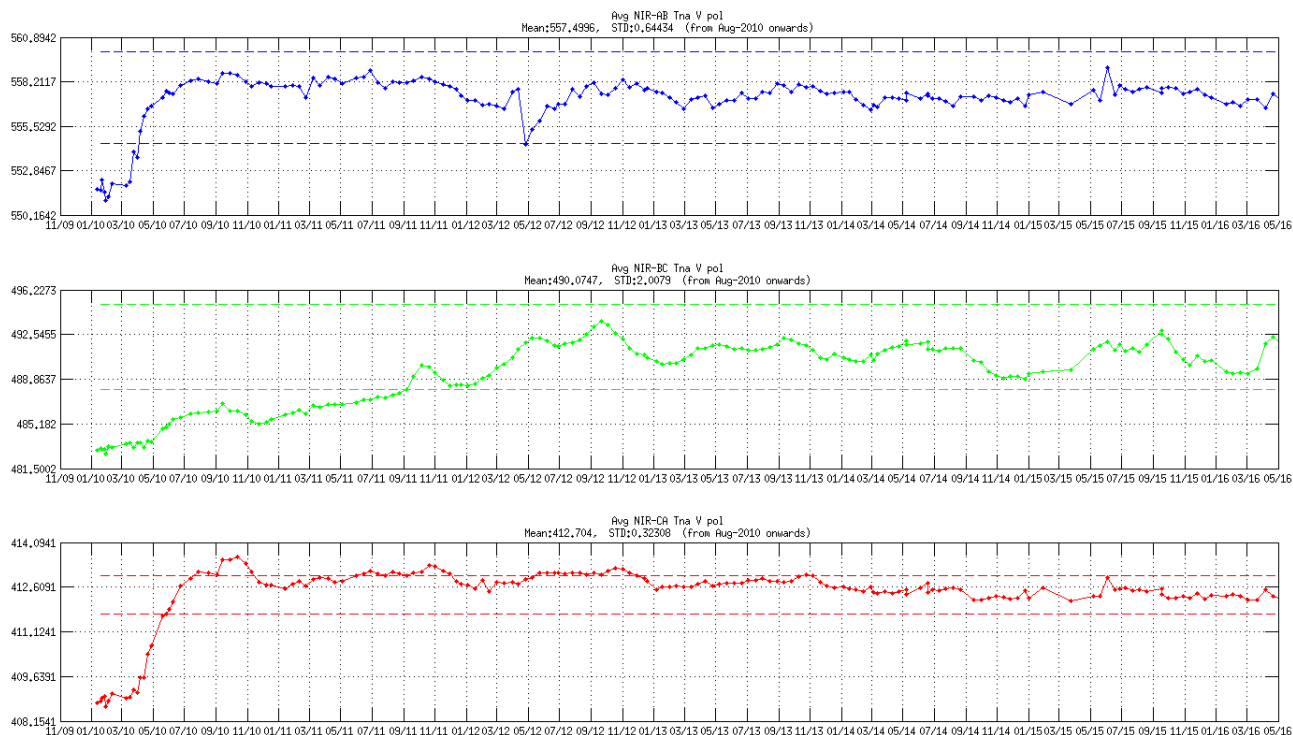
The leakage and cross-coupling factors of the NIR channels shown in Figure 7 and Figure 8 remain small and no problems can be observed apart from a peak in the phase of the NIR-AB cross-coupling term on 11 April 2012. That peak corresponds to an anomaly in the NIR-AB that did not have impact on the data.



**Figure 1 Tna evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the H-channel since the beginning of the mission. Thresholds in dashed lines**

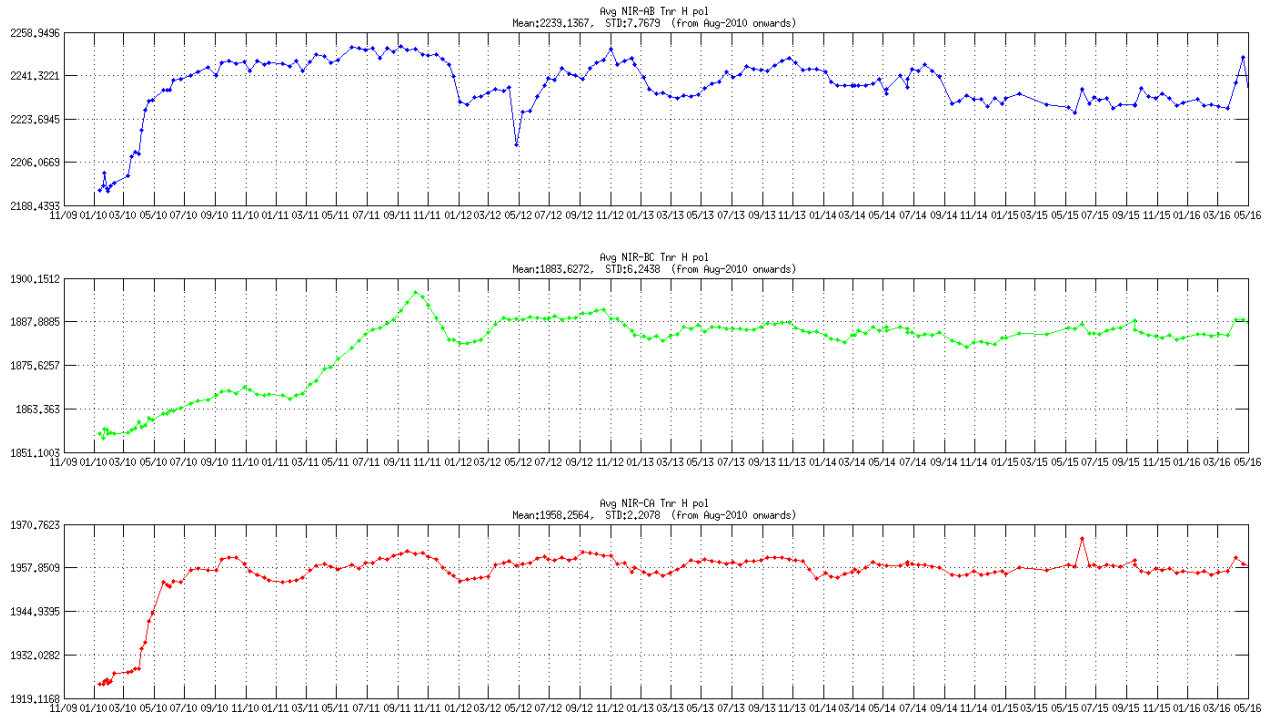


**Figure 2 Tna evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the V-channel since the beginning of the mission. Thresholds in dashed lines**

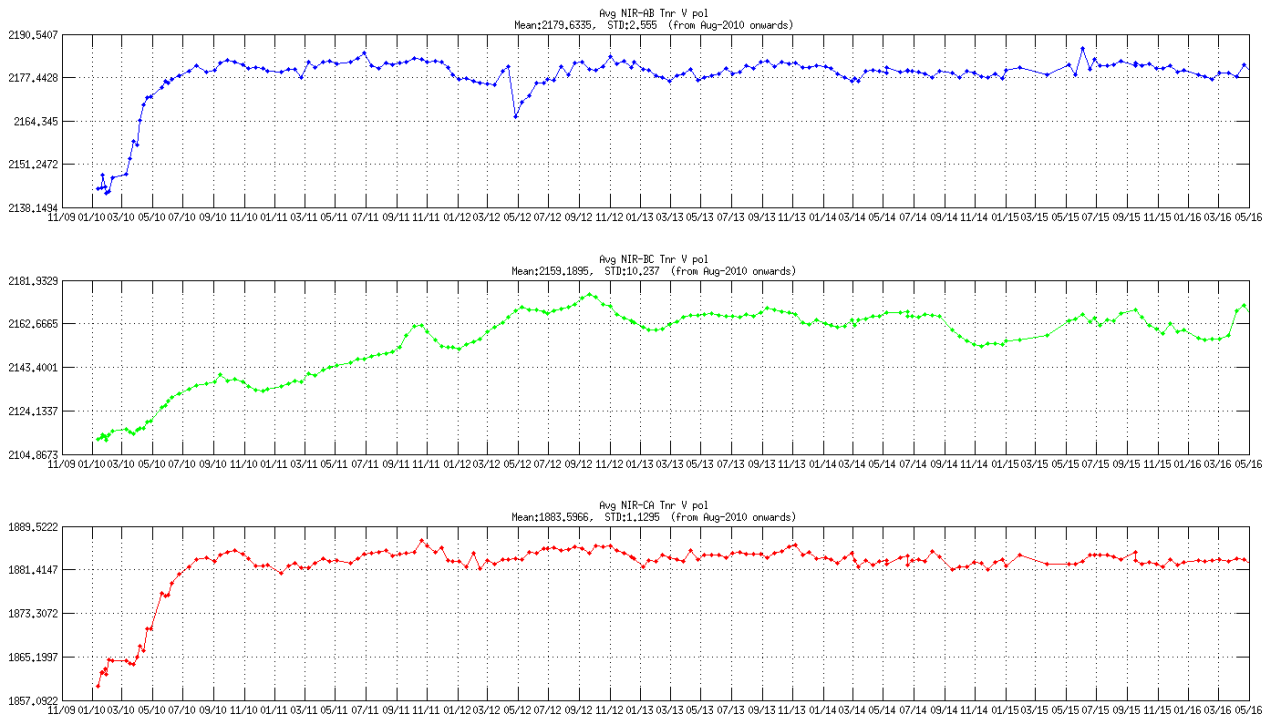




**Figure 3 Tnr evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the H-channel since the beginning of the mission.**

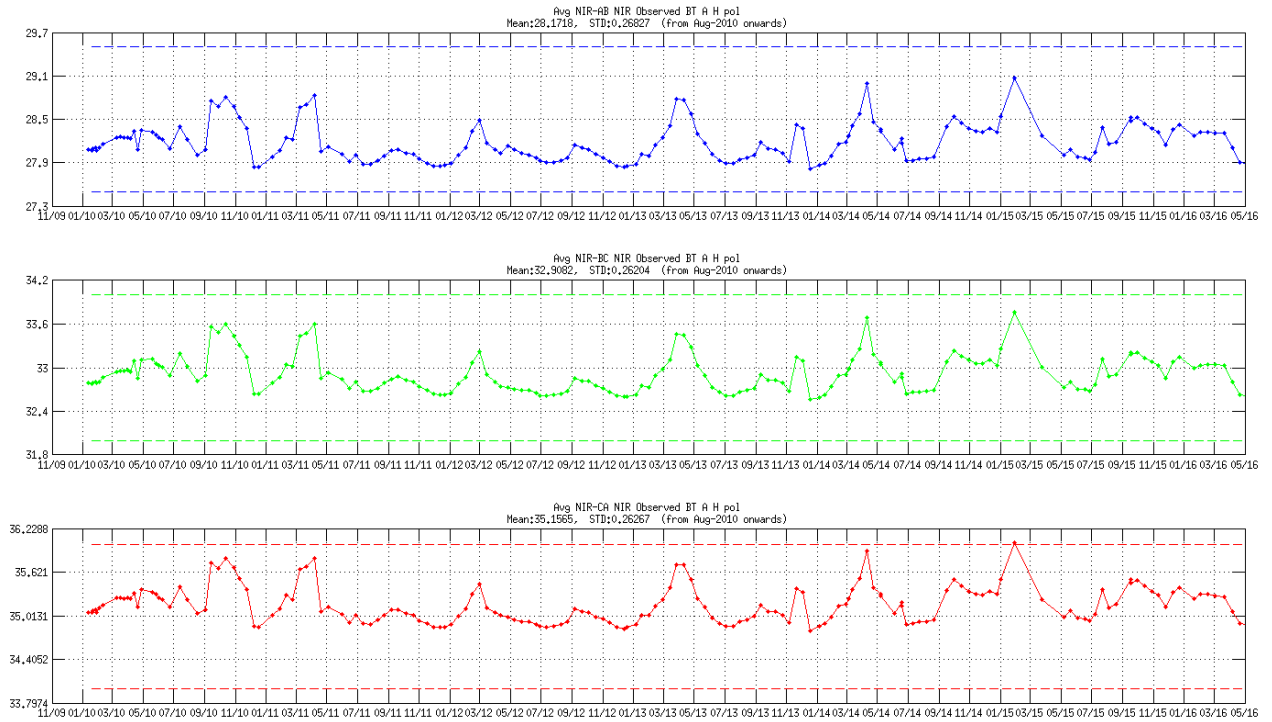


**Figure 4 Tnr evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the V-channel since the beginning of the mission.**

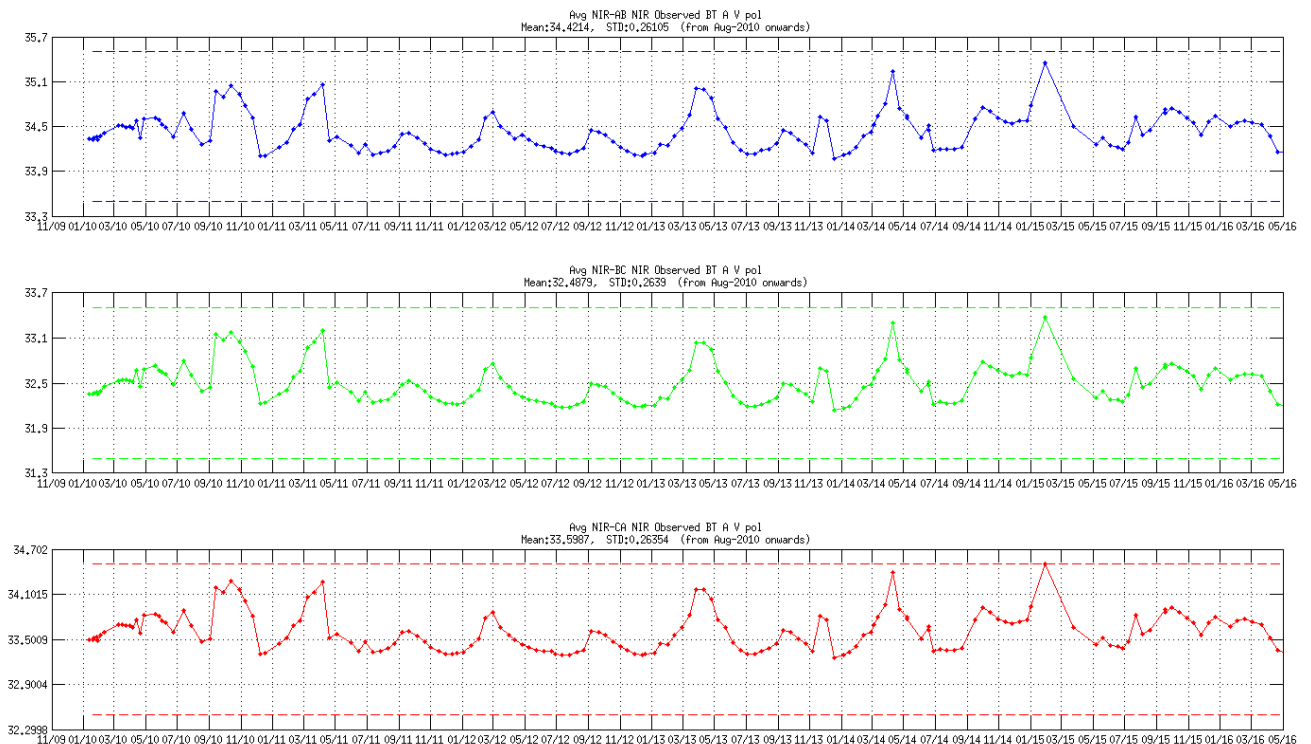




**Figure 5 NIR Observed BT evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the H-channel since the beginning of the mission. Thresholds in dashed lines**

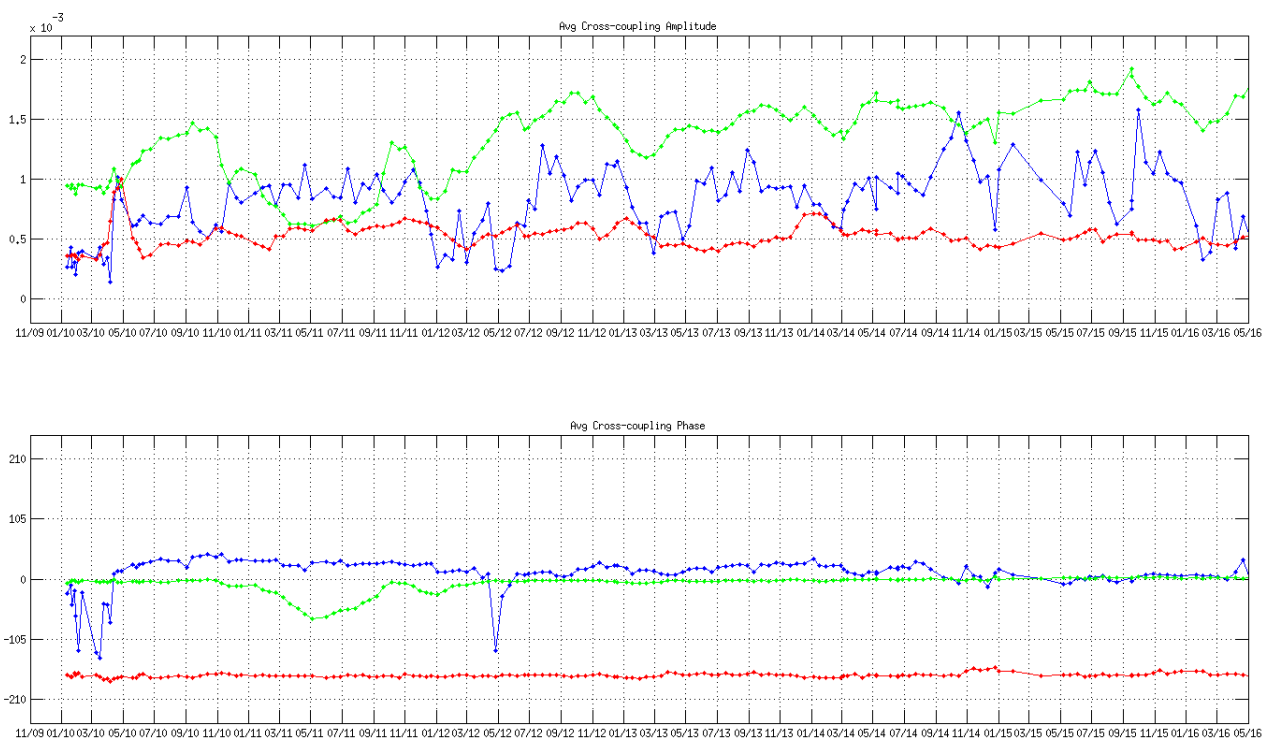


**Figure 6 NIR Observed BT evolution of NIR AB (blue), NIR BC (green) and NIR CA (red) in the V-channel since the beginning of the mission. Thresholds in dashed lines**

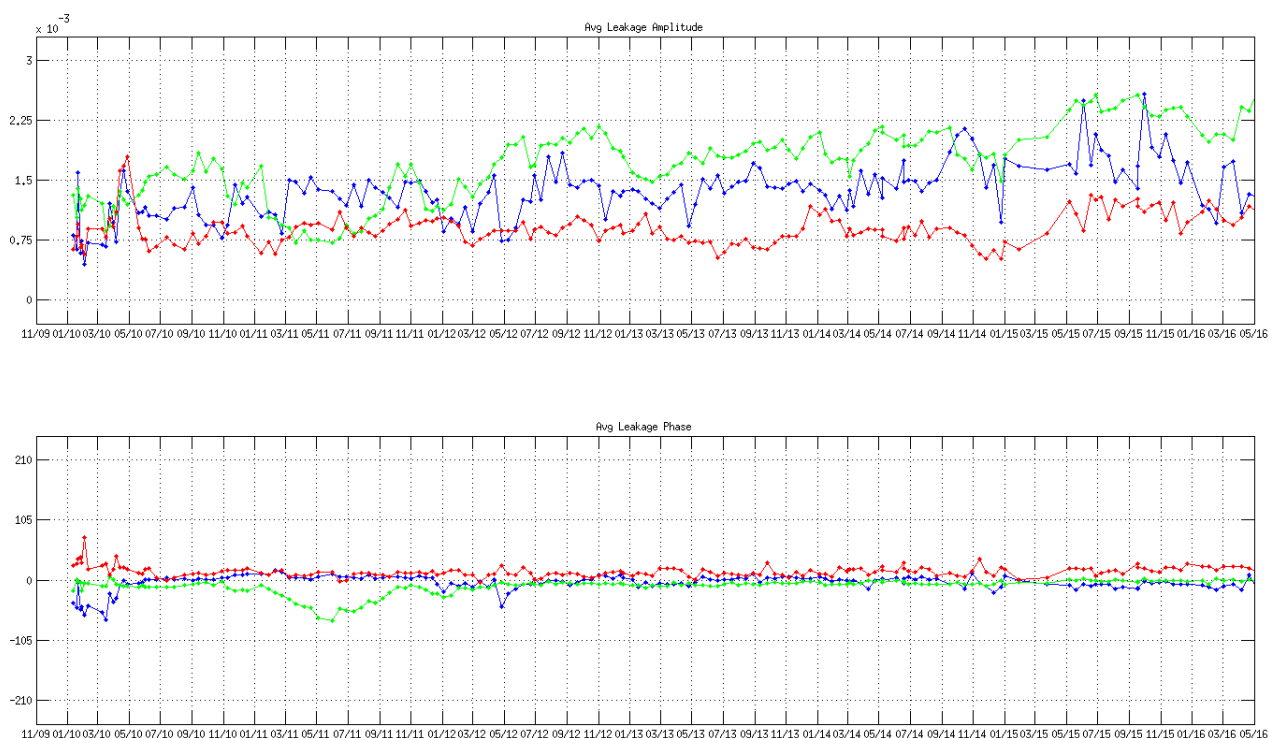




**Figure 7 Cross-coupling evolution in amplitude and phase of NIR AB (blue), NIR BC (green) and NIR CA (red) since the beginning of the mission**



**Figure 8 Leakage factor evolution in amplitude and phase of NIR AB (blue), NIR BC (green) and NIR CA (red) since the beginning of the mission**





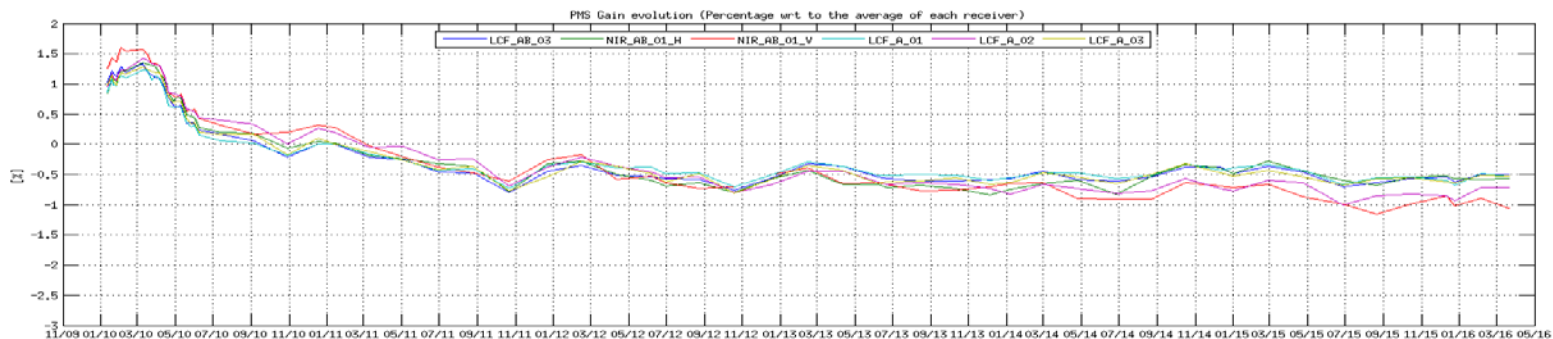
The LICEF calibration status is updated by long (every 8 weeks) and short (weekly) on-board calibration activities. No long calibration has been executed during the reporting period.

LICEF PMS gain is derived during the long calibration activity and the Figure 9 to Figure 20 show the evolution (V62x algorithm baseline) of the deviations of the PMS gain with respect to its average over time. Apart from antenna LCF\_A\_18, LCF\_C\_11, LCF\_C\_19, which have shown an evolution from the main trend (see Figure 12, 19, 20) the others PMS are stable. LCF\_A\_10 PMS gain shown an evolution in the period January-March 2016 probability linked with the sudden increase of the antenna temperature on 10<sup>th</sup> January 2016. Investigations are still on-going to better understand the case.

Figure 21 to Figure 32 show the evolution of the PMS offsets (V62x algorithm baseline) derived during the short calibration activity.

Figure 33 shows the evolution of the average over all the baselines of the Fringe Washing Function (FWF) amplitude in the origin derived during the long calibration. The amplitude of the FWF at the origin does not show any drift and their values are inside the ranges defined in the routine calibration plan.

**Figure 9 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN H1**



**Figure 10 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN A1**

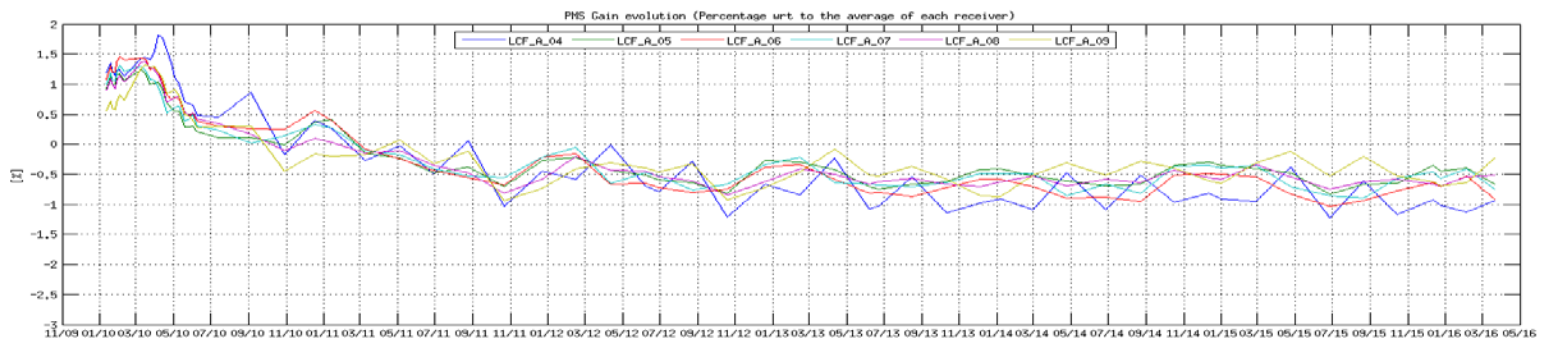






Figure 11 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN A2

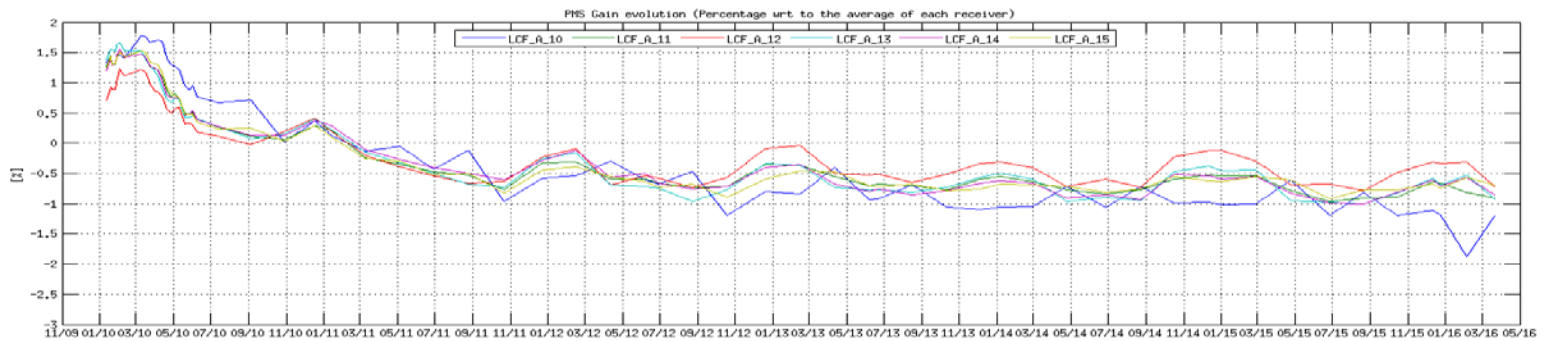


Figure 12 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN A3

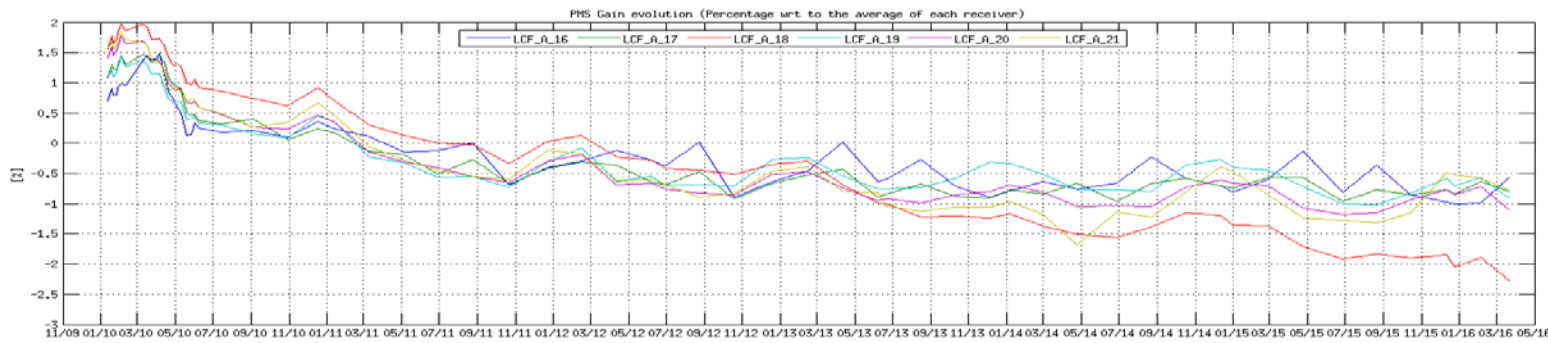


Figure 13 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN H2

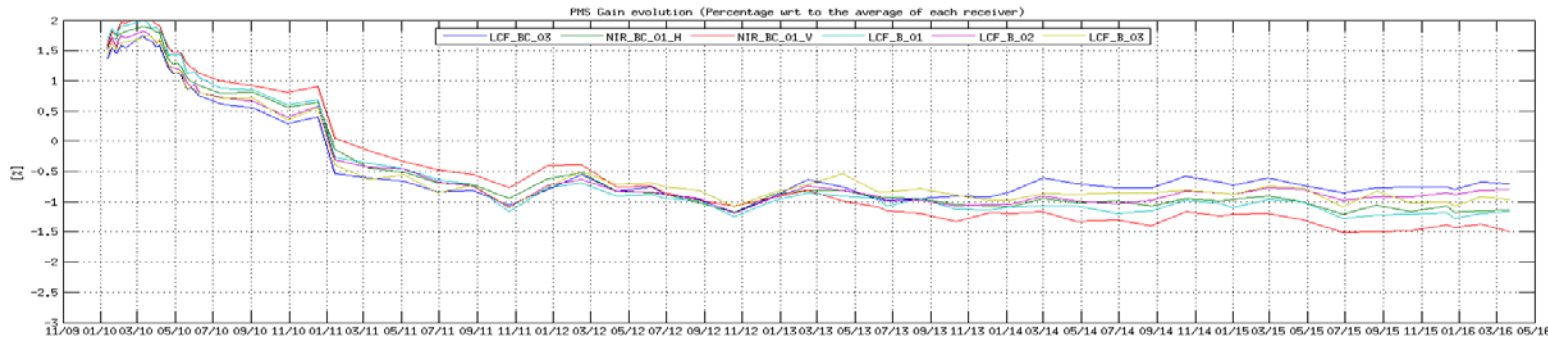


Figure 14 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN B1

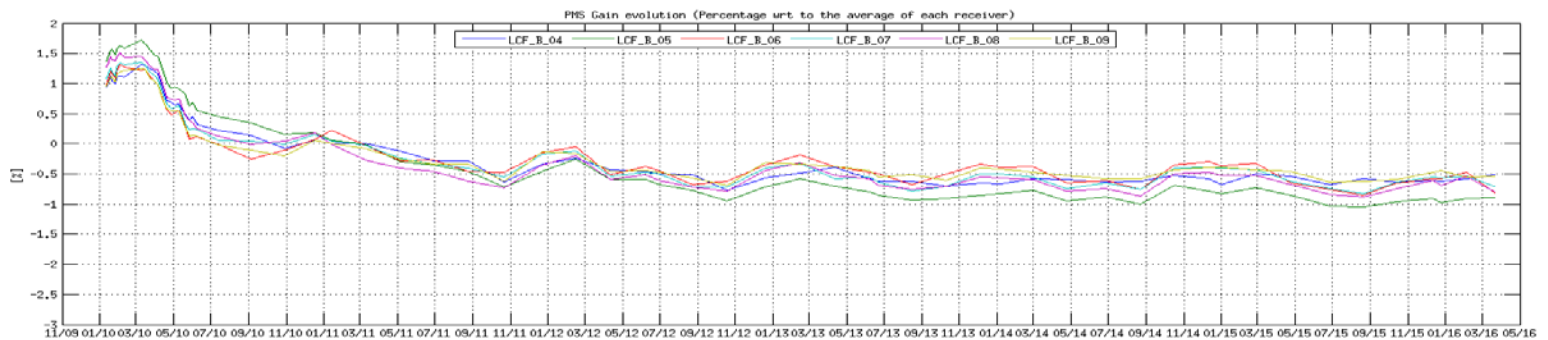




Figure 15 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN B2

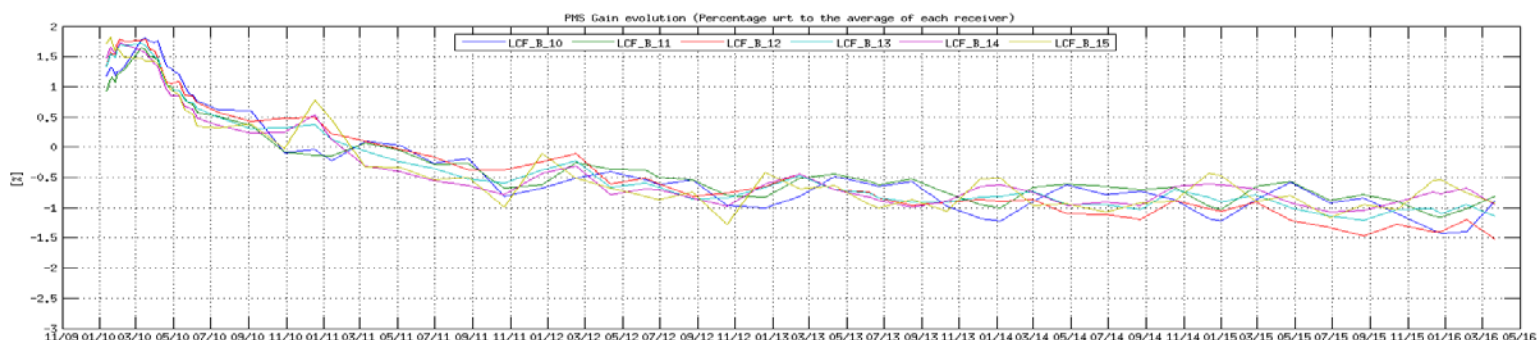


Figure 16 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN B3

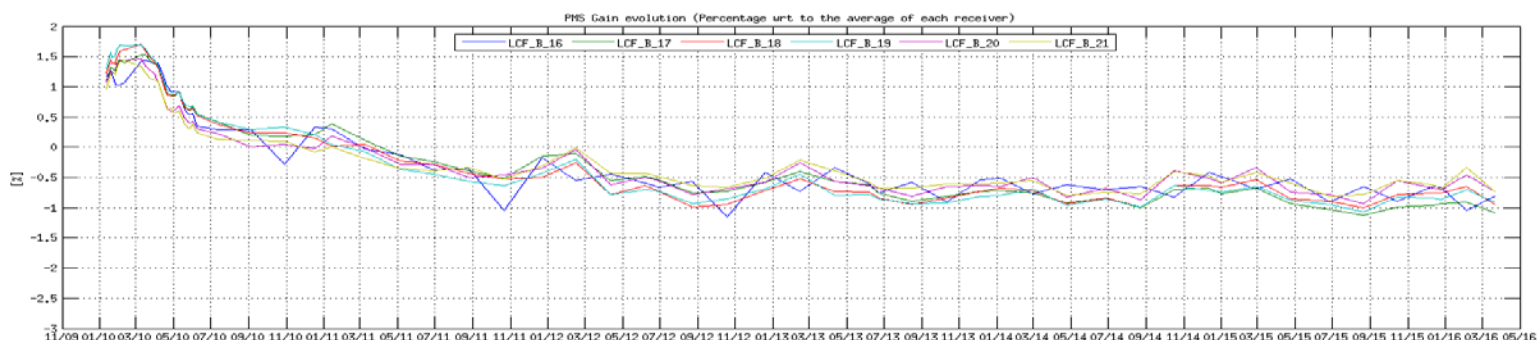


Figure 17 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN H3

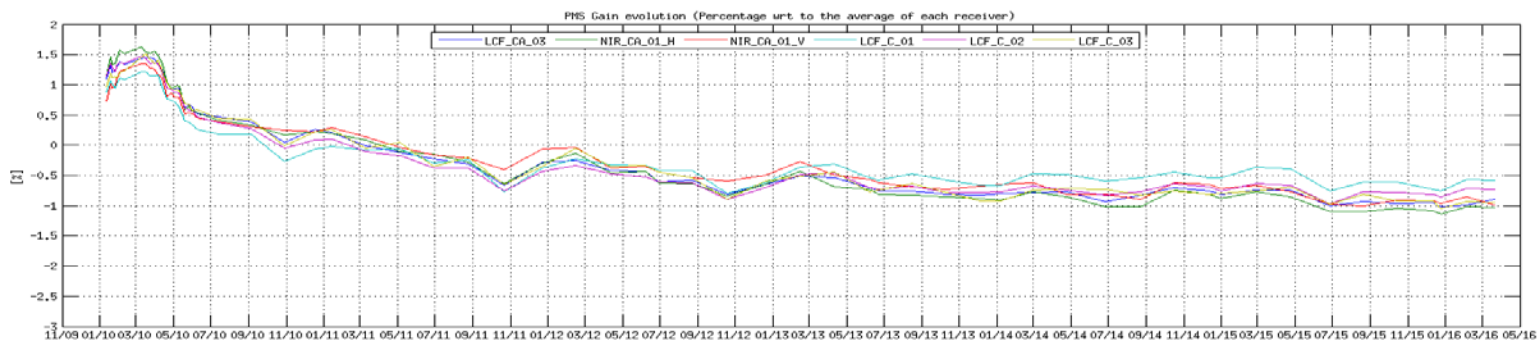


Figure 18 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN C1

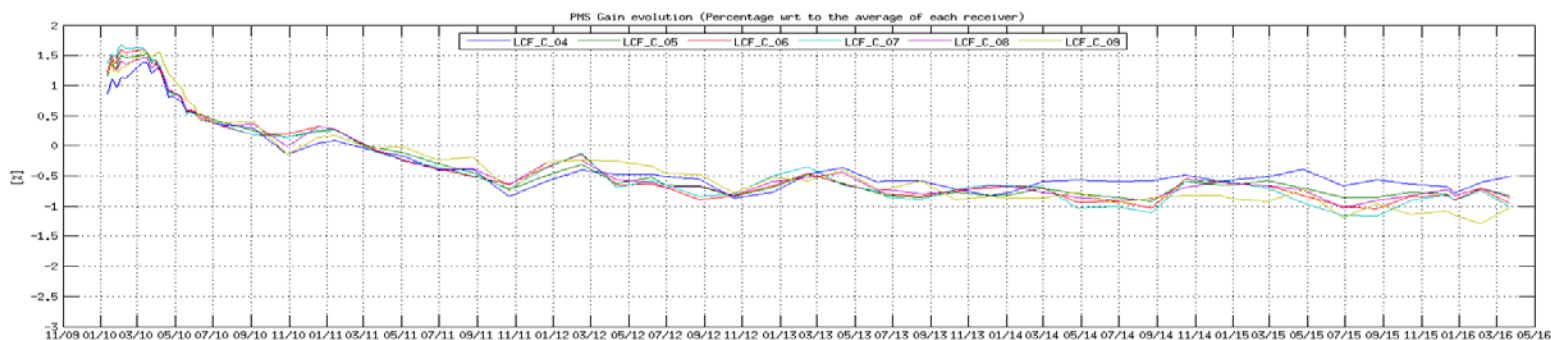






Figure 19 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN C2

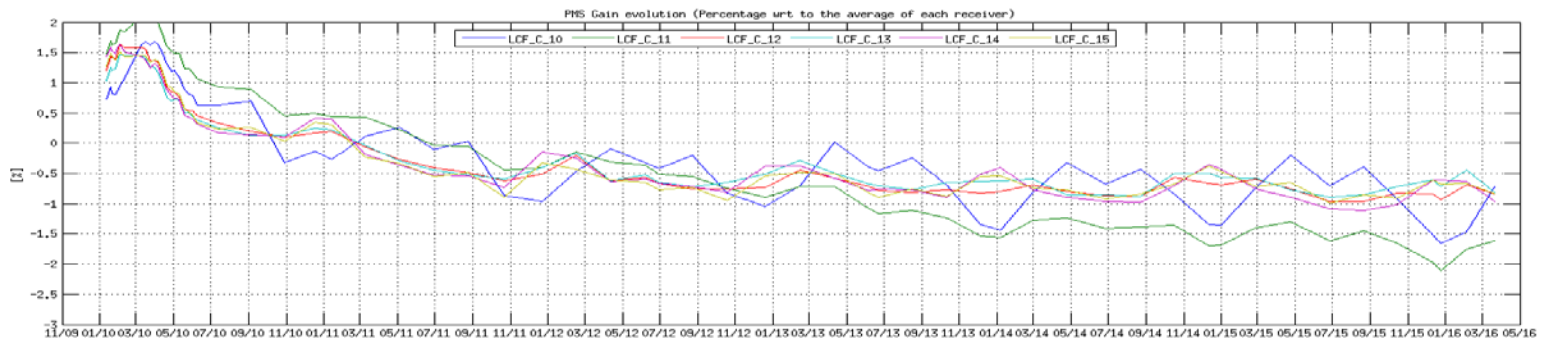


Figure 20 Evolution of the  $\Delta$  PMS Gain of the LICEFS in CMN C3

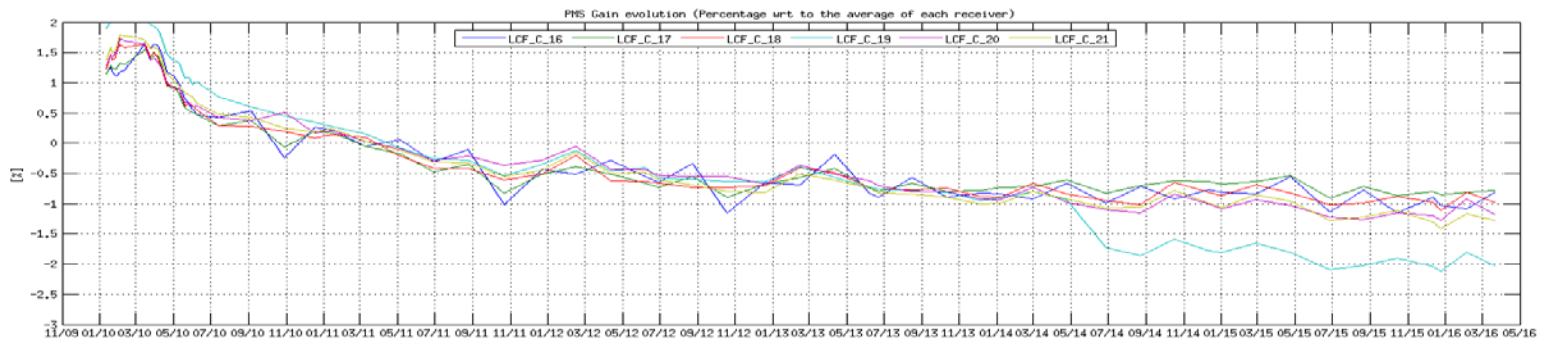


Figure 21 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN H1

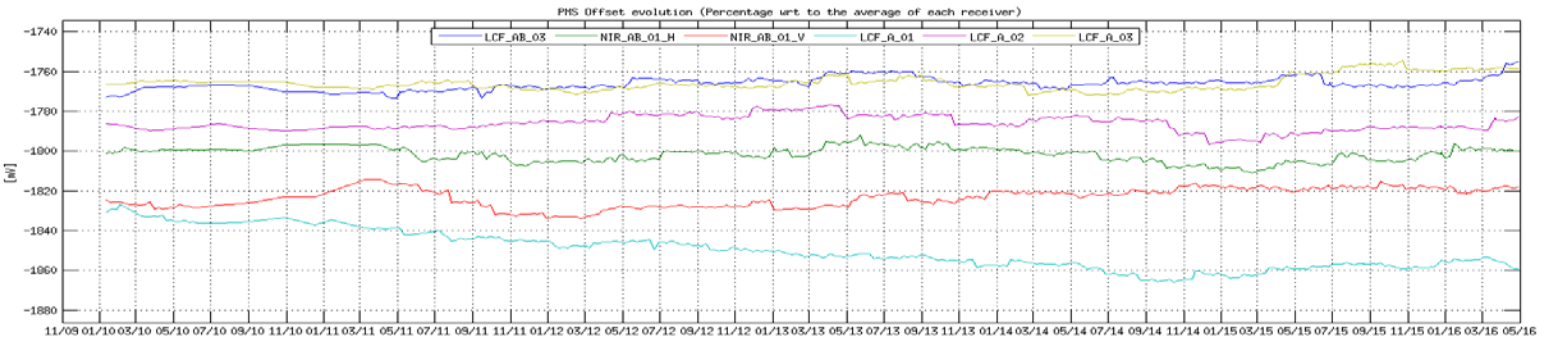


Figure 22 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN A1

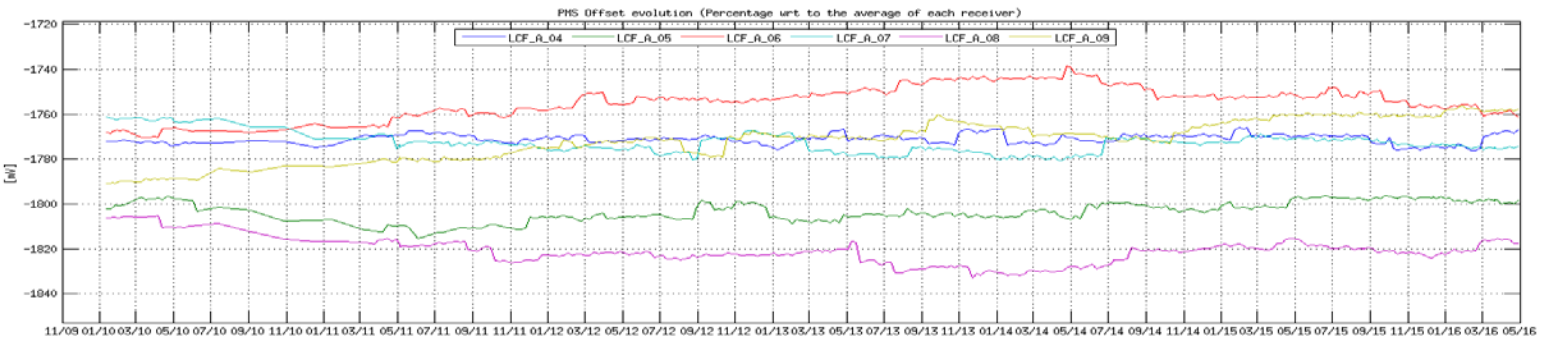


Figure 23 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN A2

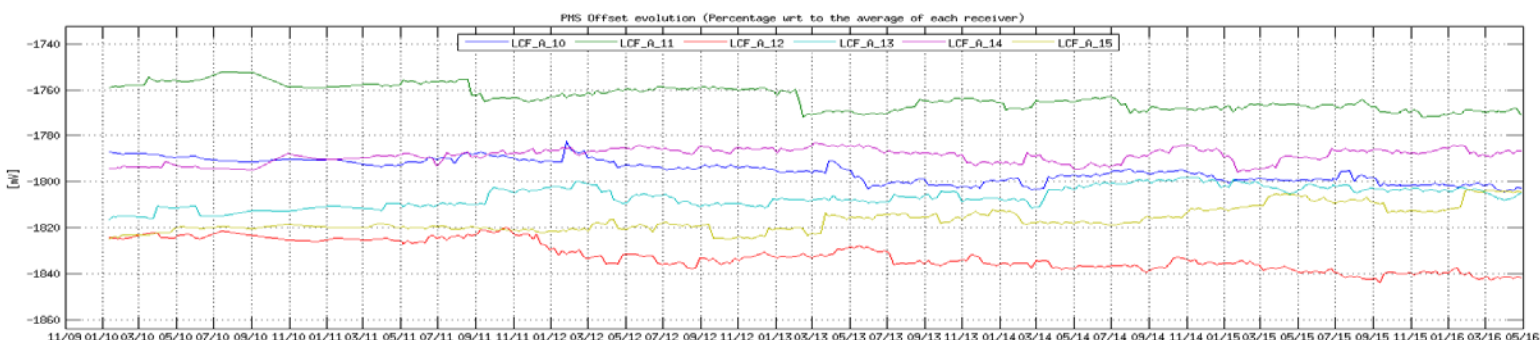


Figure 24 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN A3

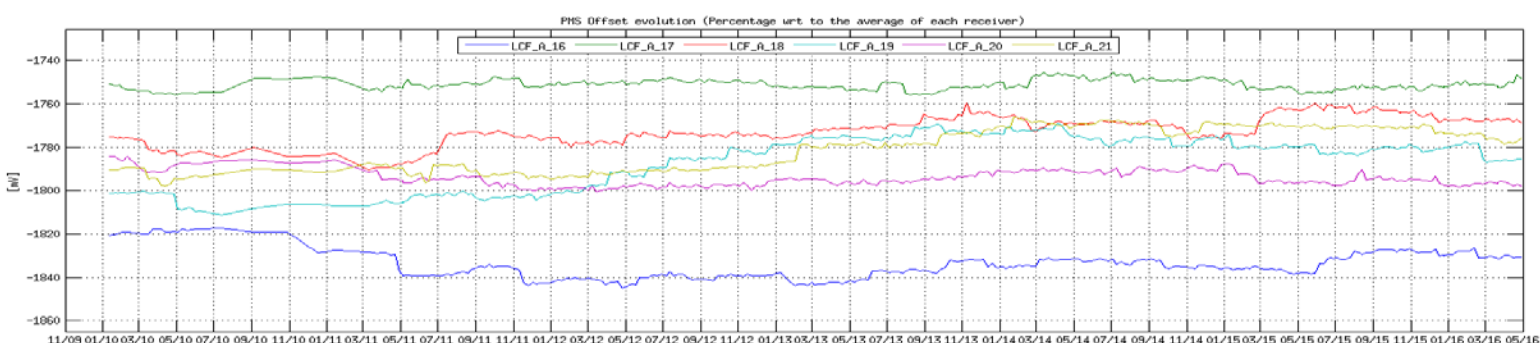


Figure 25 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN H2

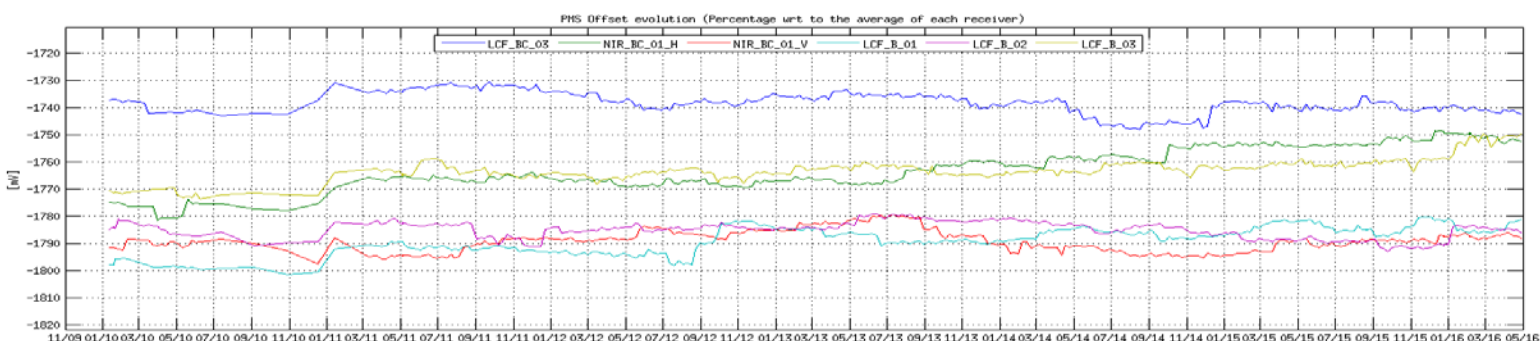


Figure 26 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN B1

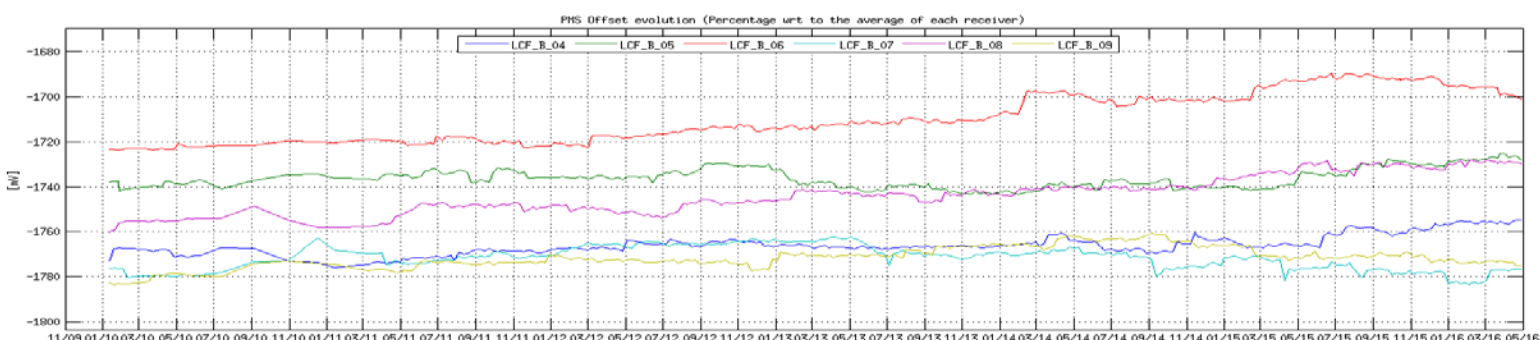




Figure 27 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN B2

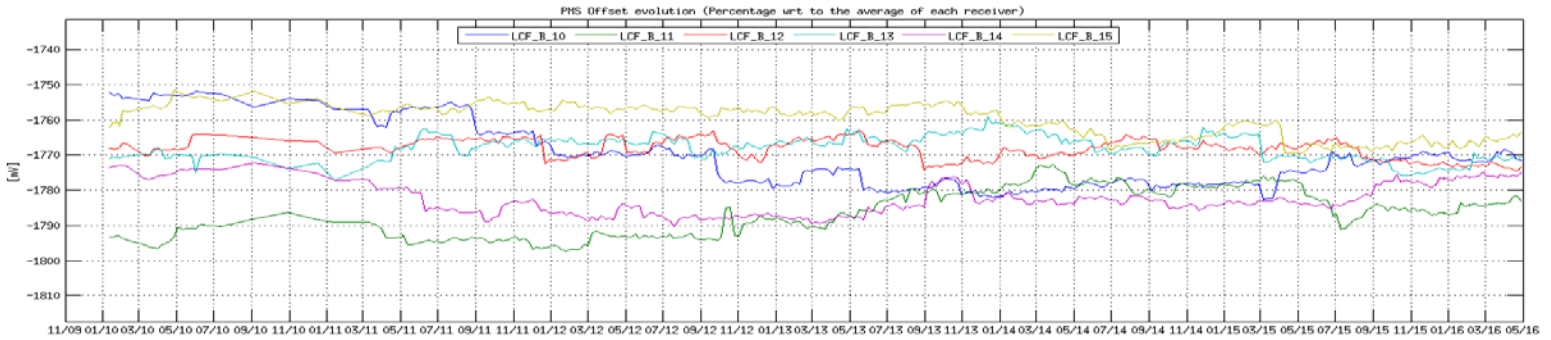


Figure 28 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN B3

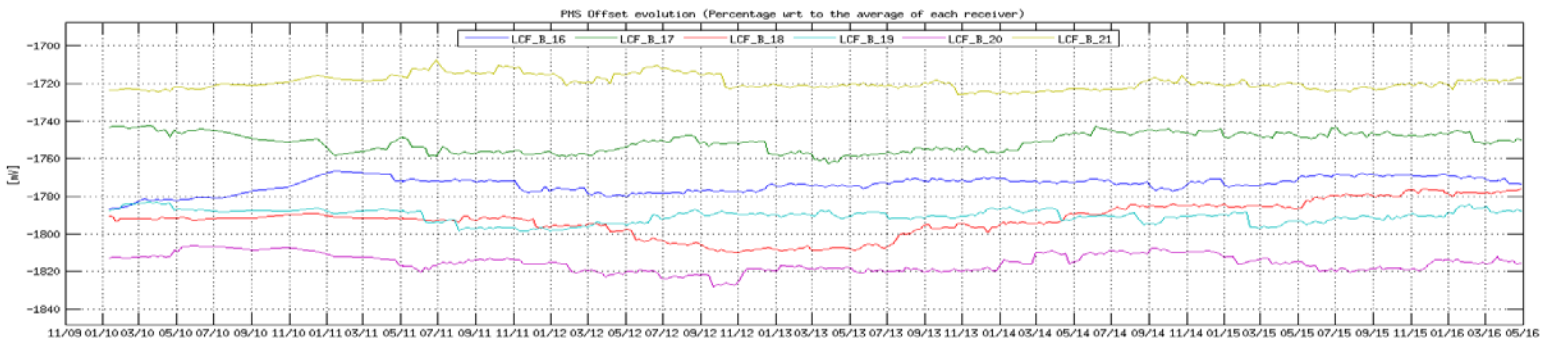


Figure 29 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN H3

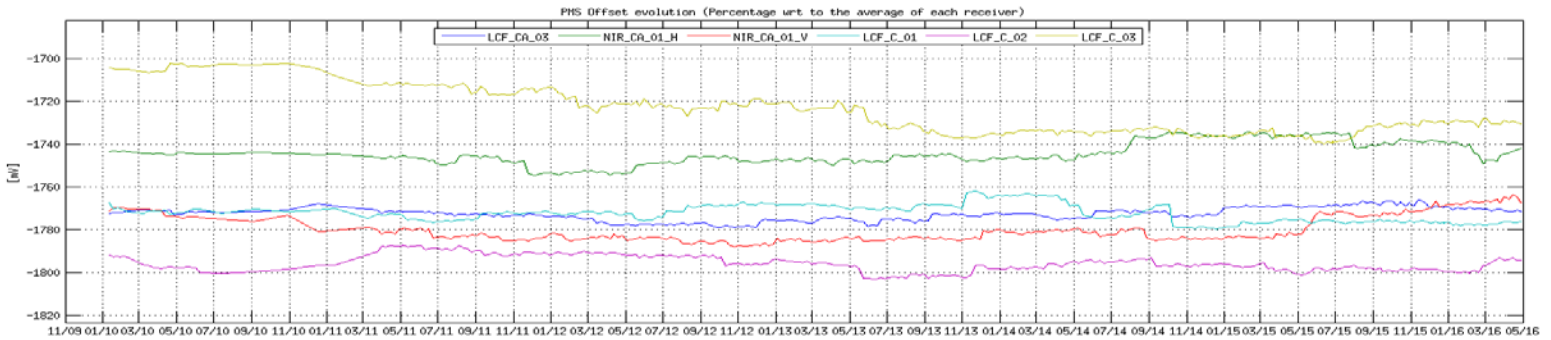


Figure 30 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN C1

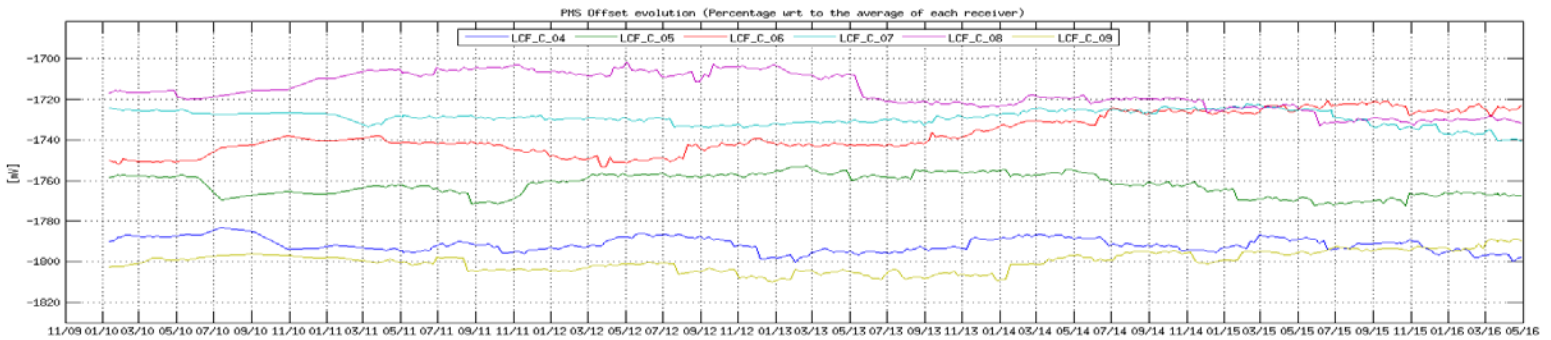




Figure 31 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN C2

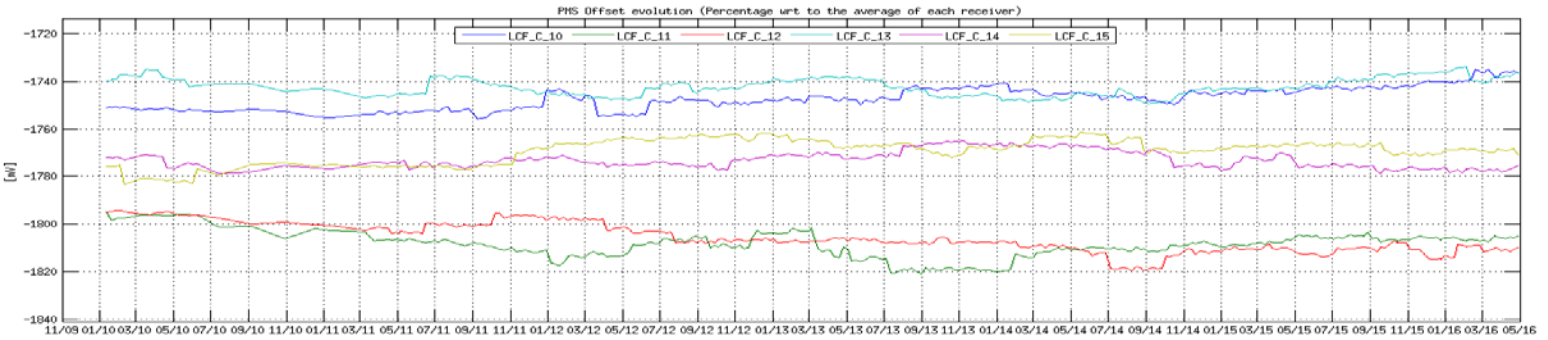


Figure 32 Evolution of the  $\Delta$  PMS Offset of the LICEFS in CMN C3

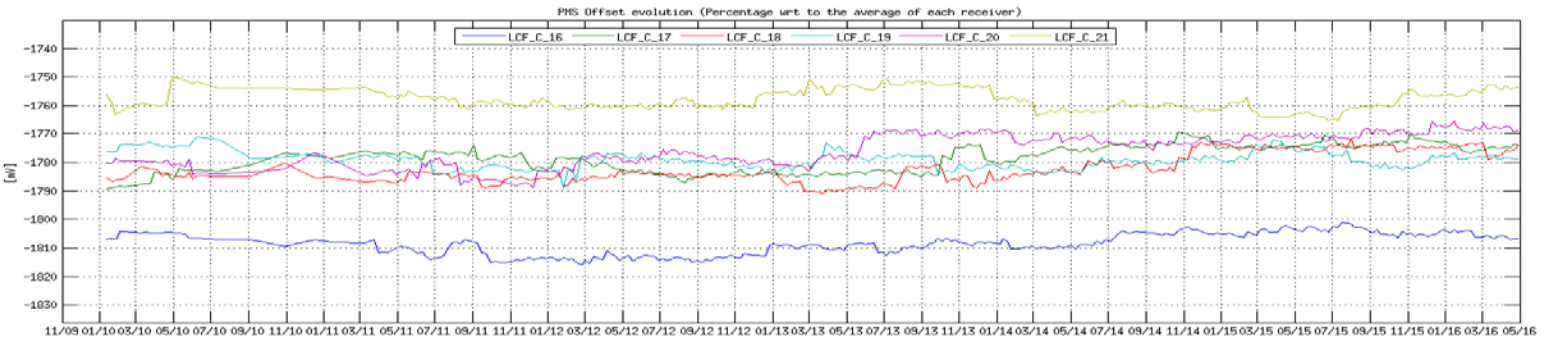
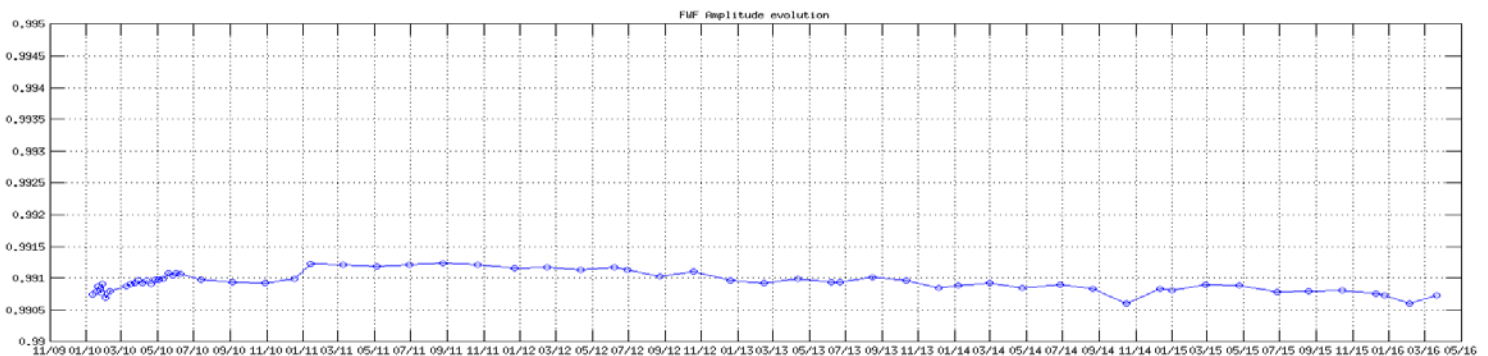
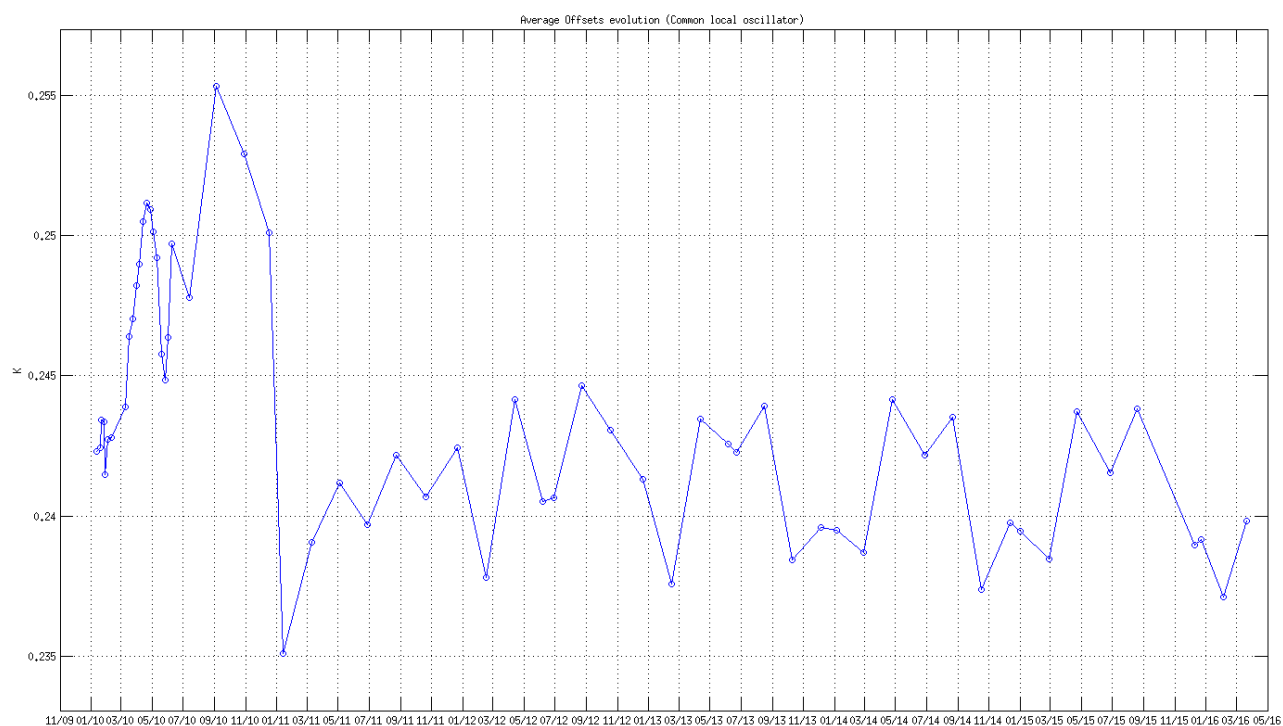


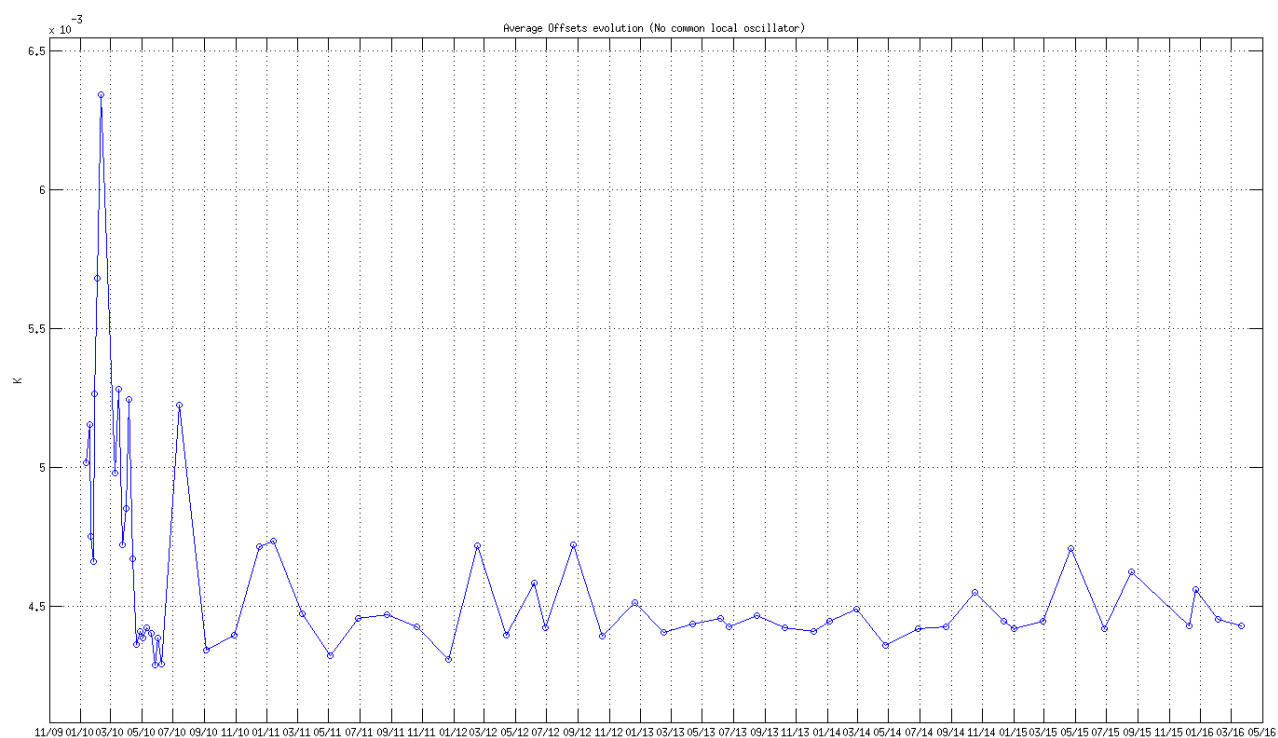
Figure 33 Evolution of the average of the FWF Amplitude at the origin



The evolution of the average of the correlator offsets does not show any significant drift. Also, the correlation offsets between receivers that do not share local oscillator remains much smaller than the correlation offsets between receivers sharing local oscillator. This result is expected since any residual correlated signal arriving to a pair of receivers, arrives through the local oscillator signal.



**Figure 34 Evolution of the average of the Correlator offsets for the baselines which share local oscillator**



**Figure 35 Evolution of the average of the Correlator offsets for the baselines which do not share local oscillator**



## 5.2 Brightness Temperatures Trends over Dome-C Point (Antarctic)

The result of the monitoring of the evolution of the SMOS brightness temperature over Dome-C is shown in the Figure 36 (X and Y polarization at antenna frame for all the incidence angles) and in Figure 37, Figure 38 (H and V polarization at surface level for 42.0 degrees incidence angle for different areas of the Field Of View). The values are averaged every 18 days to reduce the noise and the value for July 2010 is subtracted and used as relative reference. In figure 37 are also shown in situ measurement (dome-C) from the DOMEX experiment averaged on the same period of the SMOS data.

The evolution of the brightness temperature trend over Dome-C does not show any significant drift except for the beginning of 2015 in H polarization. This drift was due to a change on surface geophysical condition: accumulation of snow since November 2014 and rapidly evolution of snow density on 22 March 2015 when a strong wind has changed the surface condition. This event has impacted the emissivity of the ice that was confirmed by on-site L-band measurement (Dome-x experiment) and from the Aquarius data set.

The brightness temperature V polarization measurements are quite stable since the beginning of the mission. The brightness temperature H polarization measurements are less stable and impacted by geophysical condition at surface level. The H polarization values remained stable from April 2015 onwards.



Figure 36: Dome-C X and Y polarization trends (all incidence angles)

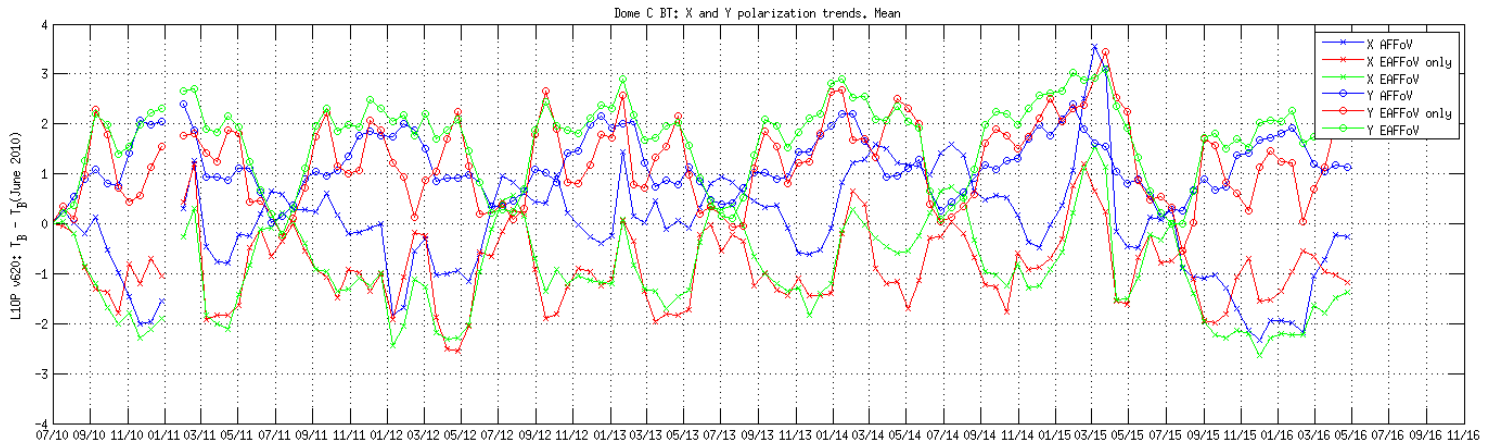


Figure 37: Dome-C H and V polarization trends in Alias Free zone (incidence angle 42°)

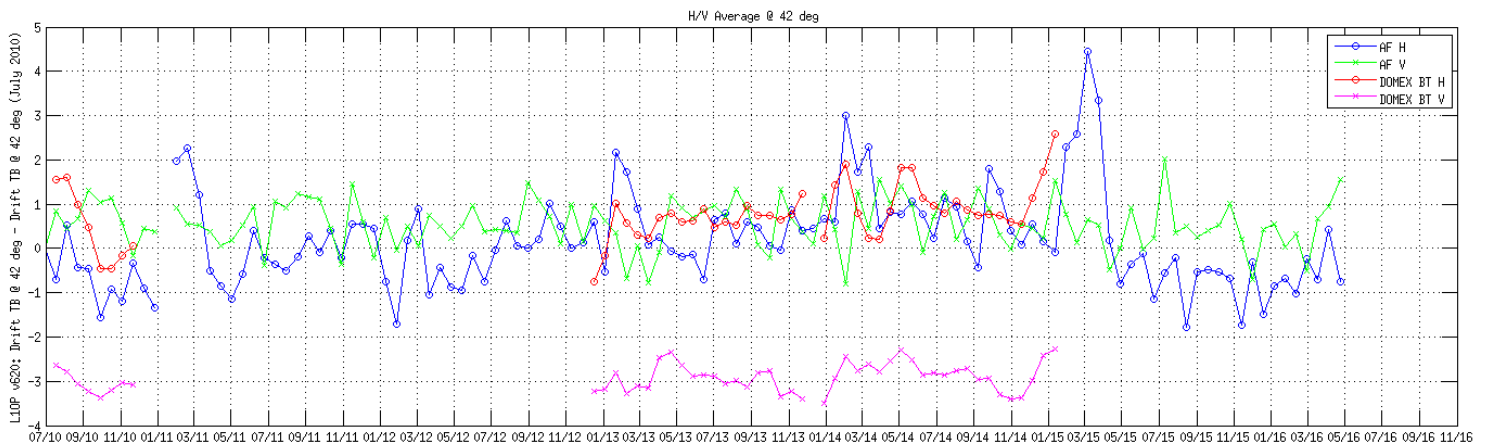
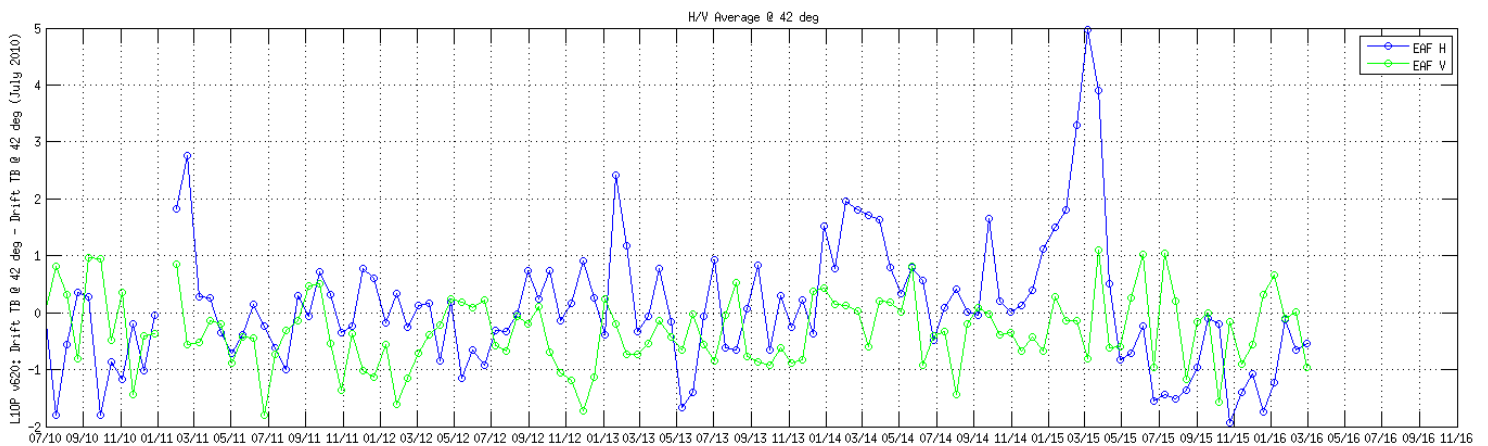


Figure 38: Dome-C H and V polarization trends in Extended Alias Free zone (incidence angle 42°)





## 6. PRODUCT QUALITY ANALYSIS

Level 1 data quality for April has found to be nominal except in the time intervals listed in the section 4.5. Weekly maps for ascending and descending passes for the Stokes 1, Stokes 3 and Stokes 4 in videos format can be found at:

[https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset\\_publisher/t5Py/content/data-quality-7059](https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset_publisher/t5Py/content/data-quality-7059)

All the artificial patterns in the maps can be explained by the presence of RFIs.

Level 2 Soil Moisture data quality for April has found to be nominal. Weekly maps for ascending and descending passes for the soil moisture in videos format can be found at:

[https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset\\_publisher/t5Py/content/data-quality-7059](https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset_publisher/t5Py/content/data-quality-7059)

The L2 Sea Surface Salinity data quality is nominal in the reporting period. Weekly maps for ascending and descending passes for good retrieved sea surface salinity in videos format can be found at:

[https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset\\_publisher/t5Py/content/data-quality-7059](https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset_publisher/t5Py/content/data-quality-7059)

The lack of good retrieval at descending passes during the winter season is due to thermal effect on the instrument. In the winter season there is a stronger temperature gradient in the antennae surface that is only partially taken into account in the current calibration schema. As result the brightness temperature are somehow degraded for ocean application. This calibration issue is under investigation by the calibration team.

Lack of retrieval is also present in the period January – February 2016 due to the increase of the LICEF A10 antenna temperature which has exceed for some short period the threshold values of 27 degC.

For more details on soil moisture and sea surface salinity retrieval algorithms and caveats in data usage see the L2 Algorithm Theoretical Baseline Documents and the read-me-first note available here:

[https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset\\_publisher/t5Py/content/data-processors-7632](https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/smos/content/-/asset_publisher/t5Py/content/data-processors-7632)





## 7. ADF CONFIGURATION AT THE END OF THE REPORTING PERIOD

ADF File Type	Operational ADF Version (DPGS Baseline)	Updated
AUX_APDL__	SM_OPER_AUX_APDL__20050101T000000_20500101T000000_300_004_3.EEF	No
AUX_APDNRT	SM_OPER_AUX_APDNRT_20050101T000000_20500101T000000_207_001_6.EEF	No
AUX_APDS__	SM_OPER_AUX_APDS__20050101T000000_20500101T000000_300_004_3.EEF	No
AUX_ATMOS__	SM_OPER_AUX_ATMOS__20050101T000000_20500101T000000_001_010_3.EEF	No
AUX_BFP__	SM_OPER_AUX_BFP__20050101T000000_20500101T000000_340_004_3.EEF	No
AUX_BNDLST	SM_OPER_AUX_BNDLST_20050101T000000_20500101T000000_300_001_3	No
AUX_BSCAT__	SM_OPER_AUX_BSCAT__20050101T000000_20500101T000000_300_003_3	No
AUX_BULL_B	SM_OPER_AUX_BULL_B_20160202T000000_20500101T000000_120_001_3	Yes
AUX_BWGHT__	SM_OPER_AUX_BWGHT__20050101T000000_20500101T000000_340_006_3.EEF	No
AUX_CNFFAR	SM_OPER_AUX_CNFFAR_20050101T000000_20500101T000000_100_002_3.EEF	No
AUX_CNFL0P	SM_OPER_AUX_CNFL0P_20050101T000000_20500101T000000_001_005_3.EEF	No
AUX_CNFL1P	SM_OPER_AUX_CNFL1P_20110206T010100_20500101T000000_620_051_3.EEF	No
AUX_CNFNRT	SM_OPER_AUX_CNFNRT_20050101T000000_20500101T000000_620_010_3.EEF	No
AUX_CNFOSD	SM_OPER_AUX_CNFOSD_20050101T000000_20500101T000000_001_024_3.EEF	No
AUX_CNFOSF	SM_OPER_AUX_CNFOSF_20050101T000000_20500101T000000_001_026_3.EEF	No
AUX_CNFSMD	SM_OPER_AUX_CNFSMD_20050101T000000_20500101T000000_001_014_3.EEF	No
AUX_CNFSMF	SM_OPER_AUX_CNFSMF_20050101T000000_20500101T000000_001_014_3.EEF	No
AUX_DFFFRA	SM_OPER_AUX_DFFFRA_20050101T000000_20500101T000000_001_005_3	No
AUX_DFFLMX	SM_OPER_AUX_DFFLMX_20050101T000000_20500101T000000_001_006_3	No
AUX_DFFSOI	SM_OPER_AUX_DFFSOI_20050101T000000_20500101T000000_001_002_3	No
AUX_DFFXYZ	SM_OPER_AUX_DFFXYZ_20050101T000000_20500101T000000_001_003_3	No
AUX_DGG__	SM_OPER_AUX_DGG__20050101T000000_20500101T000000_300_003_3	No
AUX_DGGXYZ	SM_OPER_AUX_DGGXYZ_20050101T000000_20500101T000000_001_004_3	No
AUX_DISTAN	SM_OPER_AUX_DISTAN_20050101T000000_20500101T000000_001_011_3	No
AUX_DTBCUR	SM_OPER_AUX_DTBCUR_20120504T203936_20500101T000000_624_001_1Initialization file for the deployment of the L2OS V62x processor.	No
AUX_ECOLAI	SM_OPER_AUX_ECOLAI_20050101T000000_20500101T000000_305_006_3	No
AUX_ECMCDF	SM_OPER_AUX_ECMCDF_20101109T000000_20500101T000000_001_001_3.EEF SM_OPER_AUX_ECMCDF_20050101T000000_20101109T000000_001_002_3	No
AUX_FAIL__	SM_OPER_AUX_FAIL__20050101T000000_20500101T000000_300_004_3.EEF	No
AUX_FLTSEA	SM_OPER_AUX_FLTSEA_20050101T000000_20500101T000000_001_010_3.EEF	No
AUX_FOAM__	SM_OPER_AUX_FOAM__20050101T000000_20500101T000000_001_011_3	No
AUX_GAL_OS	SM_OPER_AUX_GAL_OS_20050101T000000_20500101T000000_001_011_3	No
AUX_GAL_SM	SM_OPER_AUX_GAL_SM_20050101T000000_20500101T000000_001_003_3	No
AUX_GAL2OS	SM_OPER_AUX_GAL2OS_20050101T000000_20500101T000000_001_016_3	No
AUX_GALAXY	SM_OPER_AUX_GALAXY_20050101T000000_20500101T000000_300_004_3	No
AUX_GALNIR	SM_OPER_AUX_GALNIR_20050101T000000_20500101T000000_300_003_3	No
AUX_LANDCL	SM_OPER_AUX_LANDCL_20050101T000000_20500101T000000_001_004_3.EEF	No
AUX_LCF__	SM_OPER_AUX_LCF__20050101T000000_20500101T000000_500_016_3.EEF	No
AUX_LSMASK	SM_OPER_AUX_LSMASK_20050101T000000_20500101T000000_300_003_3	No
AUX_MASK__	SM_OPER_AUX_MASK__20050101T000000_20500101T000000_300_002_3	No
AUX_MISP__	SM_OPER_AUX_MISP__20050101T000000_20500101T000000_300_004_3.EEF	No
AUX_MN_WEF	SM_OPER_AUX_MN_WEF_20050101T000000_20500101T000000_001_002_3	No
AUX_MOONT__	SM_OPER_AUX_MOONT__20050101T000000_20500101T000000_300_002_3	No
AUX_N256__	SM_OPER_AUX_N256__20050101T000000_20500101T000000_504_002_3	No
AUX_NIR__	SM_OPER_AUX_NIR__20050101T000000_20500101T000000_500_010_3.EEF	No



AUX_NRTMSK	SM_OPER_AUX_NRTMSK_20050101T000000_20500101T000000_207_001_6	No
AUX_OTT1D_	SM_OPER_AUX_OTT1D_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_OTT1F_	SM_OPER_AUX_OTT1F_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_OTT2D_	SM_OPER_AUX_OTT2D_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_OTT2F_	SM_OPER_AUX_OTT2F_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_OTT3D_	SM_OPER_AUX_OTT3D_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_OTT3F_	SM_OPER_AUX_OTT3F_20120504T203936_20500101T000000_624_001_1 Initialization file for the deployment of the L2OS V62x processor. Since level 2 OS processor V62x the new file is generated on routine basis by the level 2 post processor	No
AUX_PATT_	SM_OPER_AUX_PATT_20050101T000000_20500101T000000_320_003_3	No
AUX_PLM_	SM_OPER_AUX_PLM_20050101T000000_20500101T000000_600_008_3.EEF	No
AUX_PMS_	SM_OPER_AUX_PMS_20050101T000000_20500101T000000_600_011_3.EEF	No
AUX_RFI_	SM_OPER_AUX_RFI_20050101T000000_20500101T000000_300_003_3	No
AUX_RFILST	Since level 1 processor version V62x the file is generated by CATDS on monthly basis	No
AUX_RGHNS1	SM_OPER_AUX_RGHNS1_20050101T000000_20500101T000000_001_015_3	No
AUX_RGHNS2	SM_OPER_AUX_RGHNS2_20050101T000000_20500101T000000_001_013_3	No
AUX_RGHNS3	SM_OPER_AUX_RGHNS3_20050101T000000_20500101T000000_001_015_3.EEF	No
AUX_SGLINT	SM_OPER_AUX_SGLINT_20050101T000000_20500101T000000_001_011_3	No
AUX_SOIL_P	File discontinued since level 2 SM processor V62x SM_OPER_AUX_SOIL_P_20050101T000000_20500101T000000_001_002_3	No
AUX_SPAR_	SM_OPER_AUX_SPAR_20110112T091500_20500101T000000_340_012_3.EEF SM_OPER_AUX_SPAR_20100111T120700_20110112T091500_340_011_3.EEF SM_OPER_AUX_SPAR_20050101T000000_20100111T120700_340_010_3.EEF	No
AUX_SSS_	SM_OPER_AUX_SSS_20050101T000000_20500101T000000_001_013_3	No
AUX_SUNT_	SM_OPER_AUX_SUNT_20050101T000000_20500101T000000_300_002_3	No
AUX_WEF_	SM_OPER_AUX_WEF_20050101T000000_20500101T000000_001_003_3	No
MPL_ORBSCT	SM_OPER_MPL_ORBSCT_20091102T031142_20500101T000000_360_001_1	No



## **APPENDIX A. CONFIGURATION DOCUMENT LIST**

The list of internal documents used for the generation of this report is:

- Unavailability.xls
- Details\_Calibrations.xls
- SMOS-CEC-VEG-IPF-REP-0609\_v1.76\_SMOS\_Auxiliary\_Data\_File\_List.pdf



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