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1. EXECUTIVE SUMMARY

This document summarises the instrument and product quality status as derived from data acquired since mid April till end of July 2004.

No major anomalies have been experienced during this period. Two single TRM failures experienced during this period with no significant impact on the instrument performance. The list of unavailability periods is provided in Chapter 2. This chapter provides also information on the low rate BRM mission planning, which has been modified.

Details on the Doppler Centroid evolution are provided in Chapter 2.

Radiometric stability is measured by means of ASAR and Radarsat transponders. Detailed results are provided in Chapter 3.

An updated list of auxiliary data files is provided in Chapters 4 and 5.

2. INSTRUMENT STATUS

No major anomalies experienced during this period.

Two single Antenna Transmit/Receive Module (TRM) failures have been experienced (the first ones after the launch):

- TRM-14 in Tile B2: failed to transmit in H polarization since 12 April 2004
- TRM-15 in Tile A1: failed to transmit in V polarization since 17 April 2004

Single TRM transmit failures have no significant impact on the instrument performance nor on the antenna pattern radiation shape.

2.1 UNAVAILABILITIES

Unavailability report reference	Start	Stop	Planned	Description
EN-UNA-2004/0111	14 Apr 2004 02:45:00.000 Orbit = 11094	14 Apr 2004 13:40:00.000 Orbit = 11100	Yes	Instrument unavailable due to OCM (Manoeuvre).
EN-UNA-2004/0114	20 Apr 2004 08:15:46.000 Orbit = 11183	20 Apr 2004 08:23:31.000 Orbit = 11183	Yes	Partial dump of B2 performed to investigate loss of tx power on TR module14
EN-UNA-2004/0118	20 Apr 2004 10:00:54.000 Orbit = 11184	20 Apr 2004 11:56:40.000 Orbit = 11185	No	ASAR in Heater/Refuse mode due to all 4 PSUs on tile C4 reported off.
EN-UNA-2004/0124	26 Apr 2004 21:32:03.000 Orbit = 11277	27 Apr 2004 09:41:43.000 Orbit = 11284	No	ASAR was in Heater/Refuse mode due to all PSUs on tile D3 reported off
EN-UNA-2004/0125	29 Apr 2004 08:32:08.000 Orbit = 11312	29 Apr 2004 10:18:18.000 Orbit = 11313	Yes	Antenna reset due to repeated tile D3 temperature anomalies.
EN-UNA-2004/0129	2 May 2004 21:32:47.000 Orbit = 11363	3 May 2004 09:41:44.000 Orbit = 11370	No	ASAR switched down to HEATER / REFUSE MODE due to all PSU's on tileC2 reported off.

Unavailability report reference	Start	Stop	Planned	Description
EN-UNA-2004/0176	12 Jul 2004 11:21:46.000 Orbit = 12373	12 Jul 2004 18:01:40.000 Orbit = 12377	Yes	Operations terminated to allow Pre-Op Refuse Desensitisation Patch to be up-linked

Unavailability report reference	Start	Stop	Planned	Description
EN-UNA-2004/0191	4 Aug 2004 09:19:00.000 Orbit = 12701	4 Aug 2004 09:26:00.000 Orbit = 12701	No	Antenna Reset due to TX Tile power loss
EN-UNA-2004/0193	5 Aug 2004 23:07:33.000 Orbit = 12723	5 Aug 2004 23:43:27.000 Orbit = 12724	No	ASAR in PRE-OP due to TR Parity Error on Tile E3

2.2. Data disclaimers

ASAR data over acquired over specific time intervals is of degraded quality. Data quality disclaimers are issued for each one of those intervals. Details on available disclaimers are provided below:

- From 10-Jul-2003 20:20 UTC to 11-Jul-2003 16:57 UTC.
 Problem description:
 Degraded radiometric quality due to an instrument anomaly.
 Affected products:
 All ASAR products, including level 0 products, acquired during this period.
- From 03-Aug-2003 21:15 UTC to 04-Aug-2003 12:43 UTC.
 Problem description:
 Degraded radiometric quality due to an instrument anomaly.
 Affected products:
 All ASAR products, including level 0 products, acquired during this period.
- From 19-Oct-2003 12:50:59 UTC to 20-Oct-2003 15.37.47.000 UTC
 Problem description:
 Degraded radiometric quality due to an instrument anomaly.
 Affected products:
 All ASAR products, including level 0 products, acquired during this period.
- From 28-Oct-2003 06:26:28 UTC to 28-Oct-2003 13:10:01 UTC
 Problem description:
 Data not acquired in Yaw Steering Mode but in Fine Pointing Mode (FPM).
 Large Doppler frequency values are expected.
 Affected products:
 All ASAR products, including level 0 products, acquired during this period.
- From 4-Dec-2003 21:5:23 UTC to 4-Dec-2003 22:03:31UTC
 Problem description:
 Data not acquired in Yaw Steering Mode but in Fine Pointing Mode (FPM).
 Large Doppler frequency values are expected.
 Affected products:
 All ASAR products, including level 0 products, acquired during this period.

- From 11-Dec-2003 01:45:00 UTC to 11-Dec-2003 15:11:15 UTC
Problem description
Degraded radiometric quality due to an instrument anomaly.
Affected products
All ASAR products, including level 0 products, acquired during this period.
- From 04-Jan-2004 09:15:00 UTC to 05-Jan-2003 15:25:20 UTC.
Problem description
Degraded radiometric quality due to an instrument anomaly.
Affected products
All ASAR products, including level 0 products, acquired during this period.
- From 13-Feb-2004 13:38 UTC to 14-Feb-2004 11:06:01 UTC.
Problem description
Degraded radiometric quality due to an instrument anomaly.
Affected products
All ASAR products, including level 0 products, acquired during this period.
- From 20-Feb-2004 18:00 UTC to 23-Feb-2004 13:08 UTC.
Problem description
Degraded radiometric quality due to an instrument anomaly.
Affected products
All ASAR products, including level 0 products, acquired during this period.
- From 18-Nov-2003 until 22-May-2004 00:00:00 UTC
Problem description:
Degraded ASAR GM products location accuracy.
Affected products:
All ASAR GM level 1 products (ASA_GM1_1P), acquired during this period.
Correction:
The location error in ASA_GM1_1P products acquired before 22nd of May 2004 can be corrected by the user multiplying the line numbers in the Geolocation Grid ADS by 0.97169.
- From 21-Jun-2004 07:56:33 UTC to 22-Jun-2004 11:50:18 UTC
Problem description:
Degraded Attitude Stability. Instrument operating in Yaw Steering Mode (YSM) rather than in Stellar YSM. A positive Doppler bias of about 300 Hz is observed on data acquired during this period.
Affected products:
All ASAR products, including level 0 products, acquired during this period.
- From 04-Aug-2004 02:00 UTC to 04-Aug-2004 09:26:00 UTC.
Problem description

Degraded radiometric quality due to an instrument anomaly.
Affected products
All ASAR products, including level 0 products, acquired during this period.

2.3. Low Rate Background Regional Mission

The low Rate BRM has been modified to acquire GM in HH polarisation regardless of the type of area covered. The main purpose for this change is to avoid gaps in the global coverage due to time required to perform the change of polarisation. The new LR BRM will be operational since 21 July 2004.

The new BRM definition is provided below:

Mode	Where	Swath	Polarisation
Wave	Over the sea (-15 sec from the coast line), including the Mediterranean Sea	IS2	VV
Global Monitoring	Everywhere else	-	HH over land, ice and sea-ice including the following areas: - Antarctica extended (1) - Arctic (2) - Greenland and Greenland Sea (4) - Labrador Sea and North of Canada (3,4) (1) Kara Sea (4) (2) Baffin Bay (4) - Gulf of Mexico & Caribbean Sea (5) VV: None. All GM acquisitions in HH

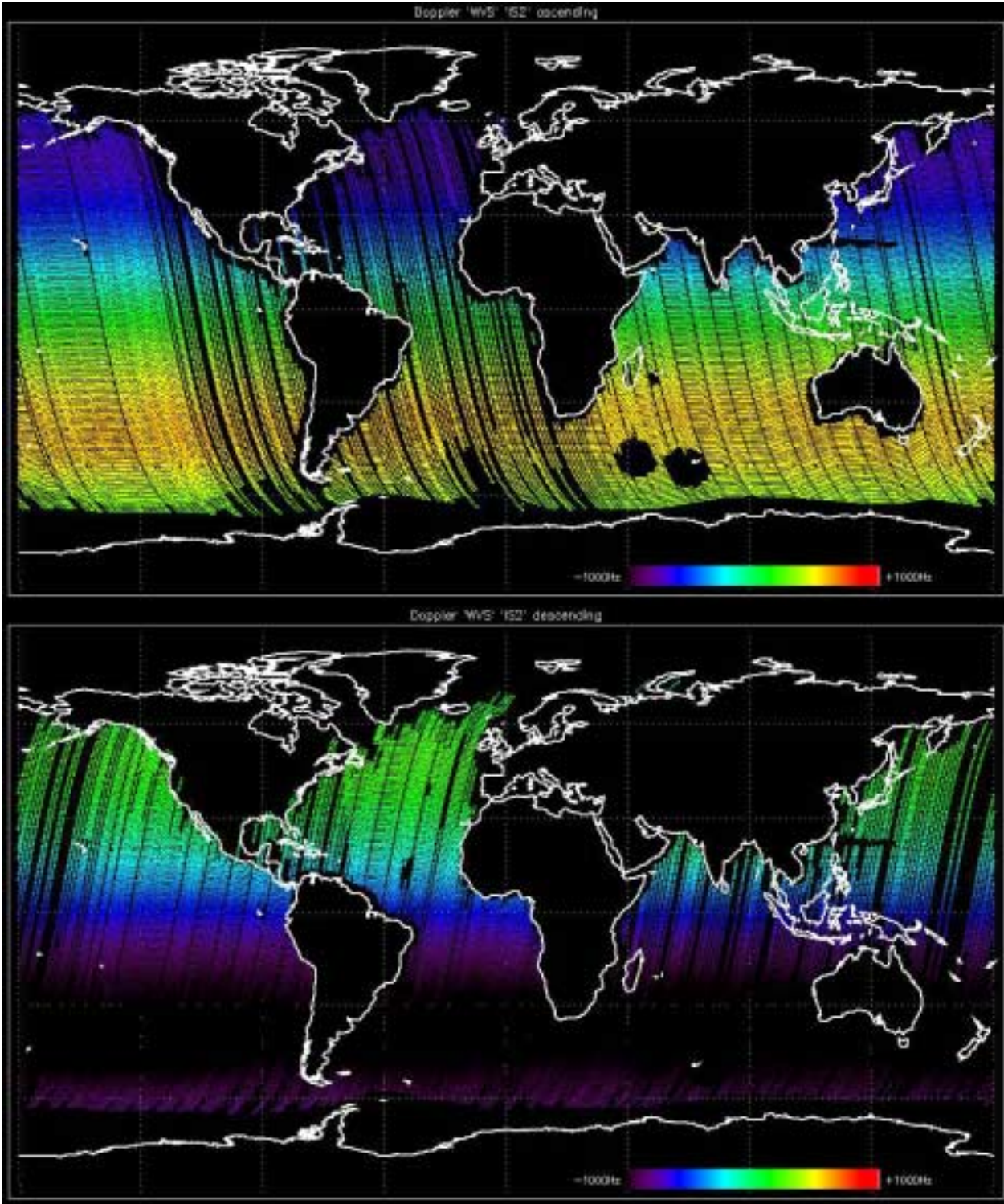
Some implementation problems observed in the past (e.g. the area East of Greenland above 70 deg. latitude that was planned as WV rather than GM) will be solved on data acquired since 21 July 2004.

3. DOPPLER MONITORING

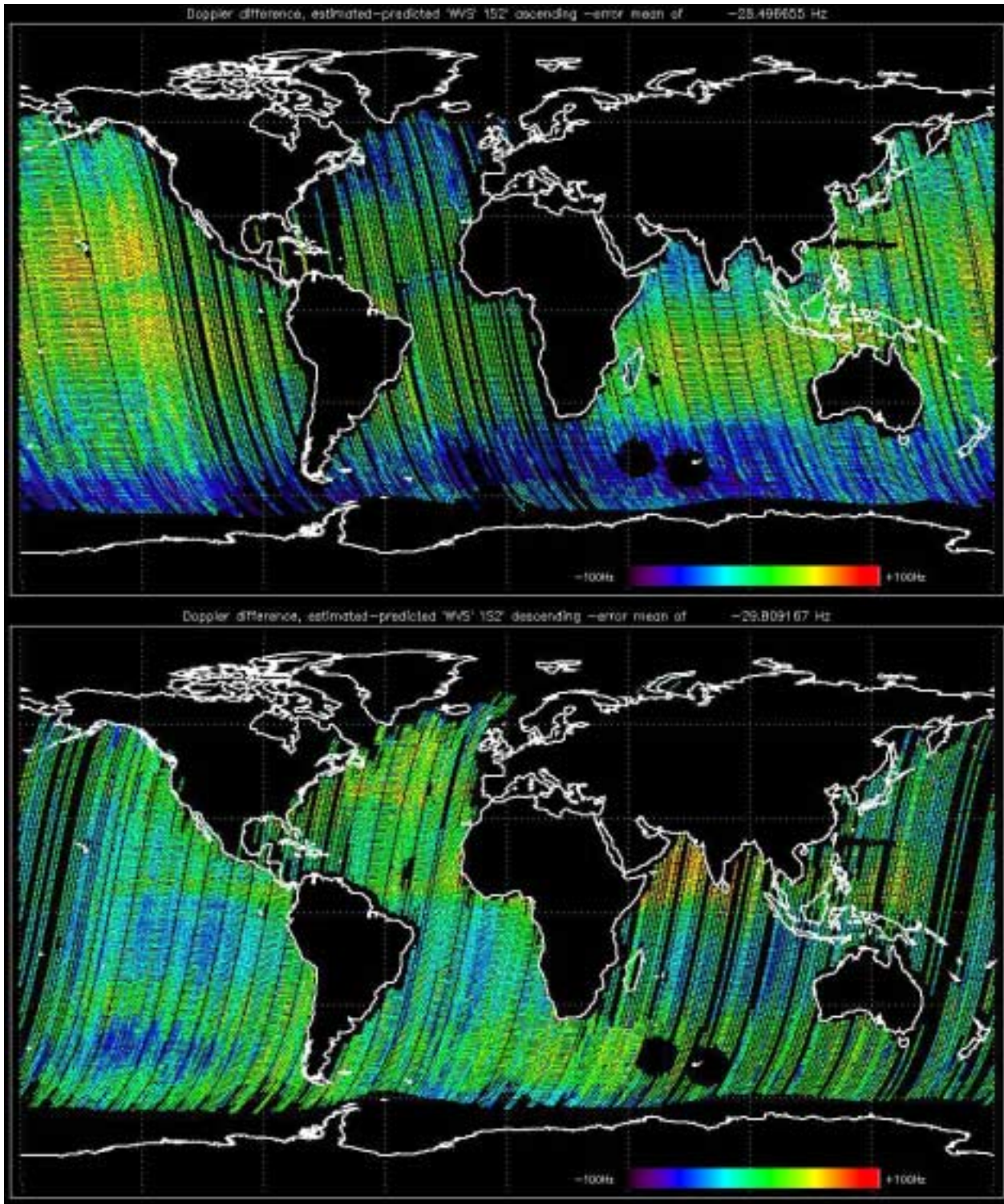
The continuous decreasing trend in the absolute Doppler Centroid frequency observed since June 2003 was corrected with the AOCS changes implemented on 11 December 2003.

A Doppler discontinuity, previously observed daily at ~ 15:00 hours, has also been removed with the AOCS s/w upgrade.

3.1. Absolute WV Doppler Centroid evolution

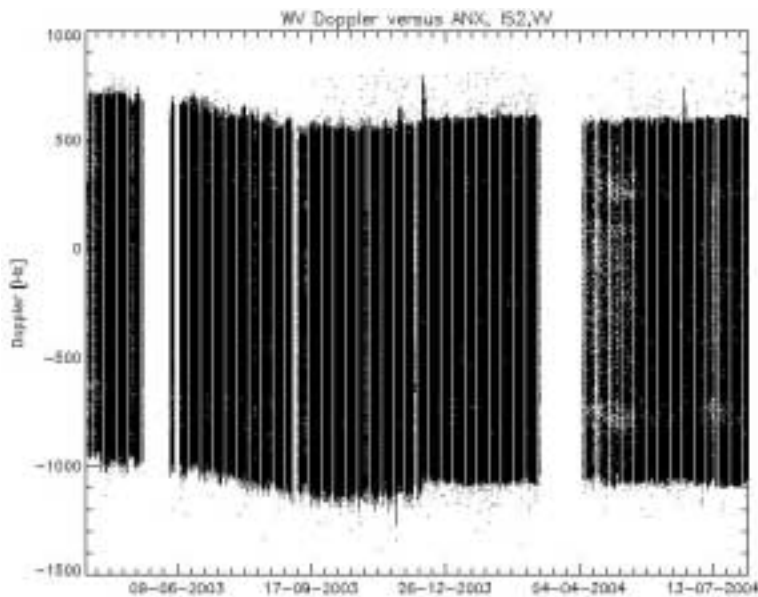


3.2. Residual WV Doppler Centroid evolution



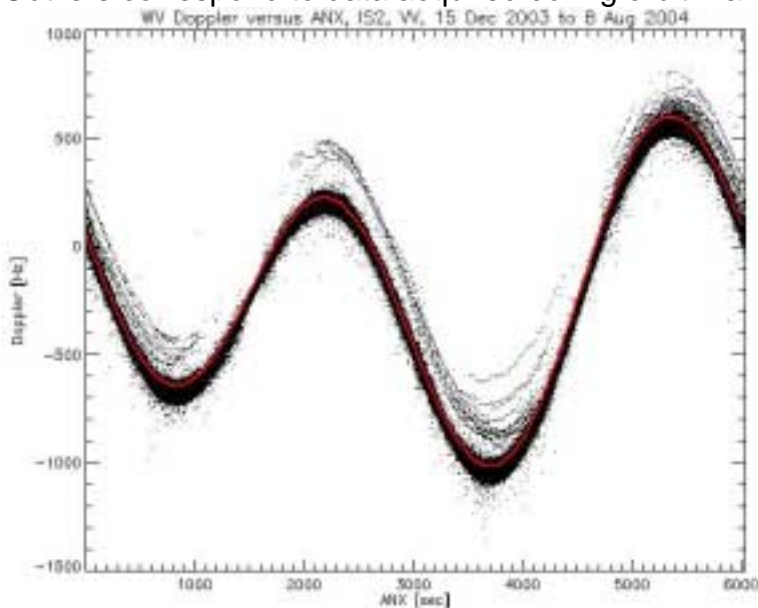
3.3. Absolute WV-IS2 Doppler Centroid evolution in time

As observed in the plot below, the decreasing trend in the ASAR Doppler has been corrected with the AOCS s/w upgrade in 11 December 2003. The Doppler has reached a stable level, although with the mean value lower than the mean Doppler early 2003.



3.4. Absolute WV-IS2 Doppler Centroid evolution vs ANX

The plot below shows the Doppler evolution (WV, IS2, VV) versus ANX for data acquired since mid December 2003 till 1st April 2004. Theoretical Doppler is in red. Outliers correspond to data acquired during orbit manoeuvres.

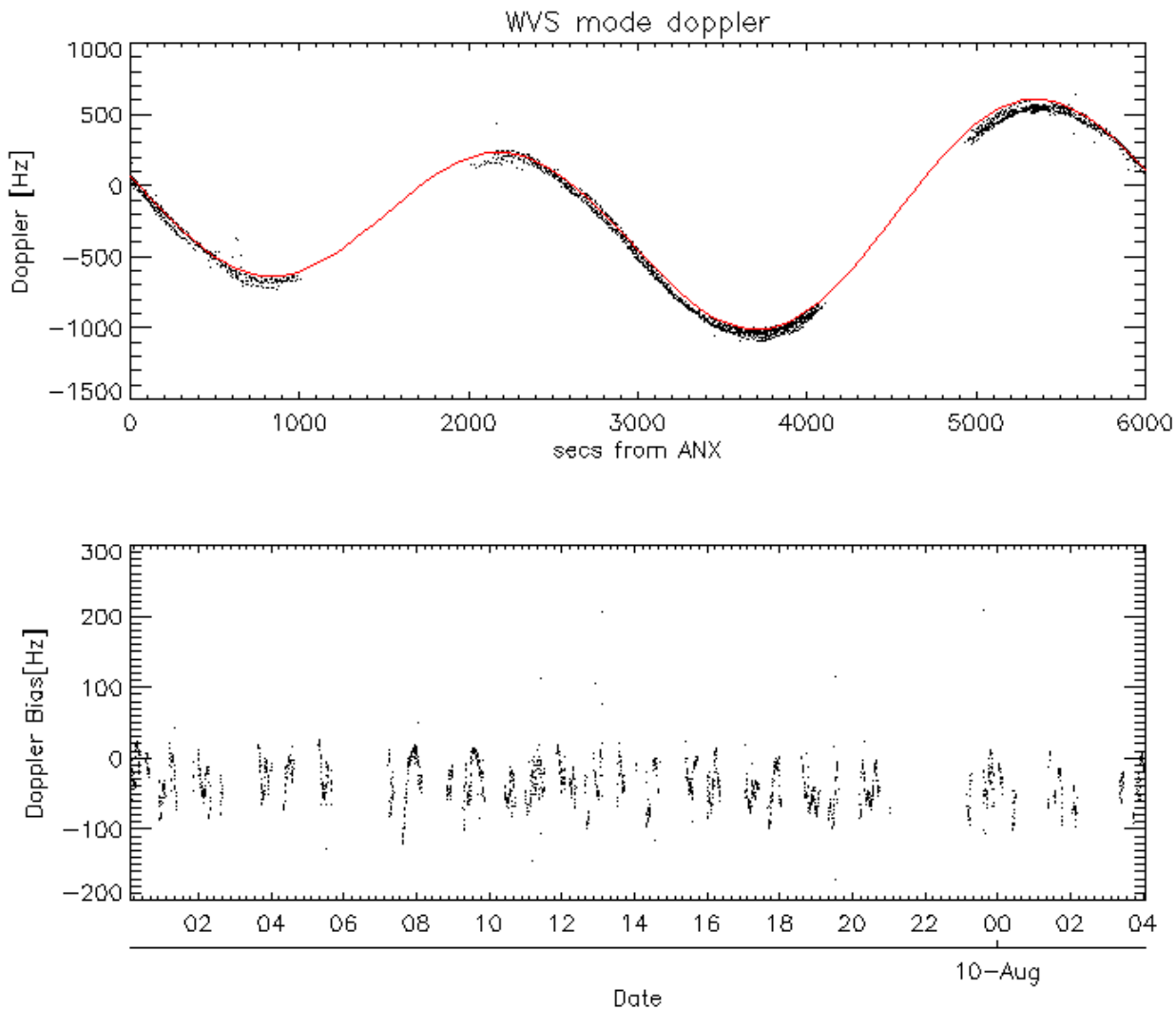


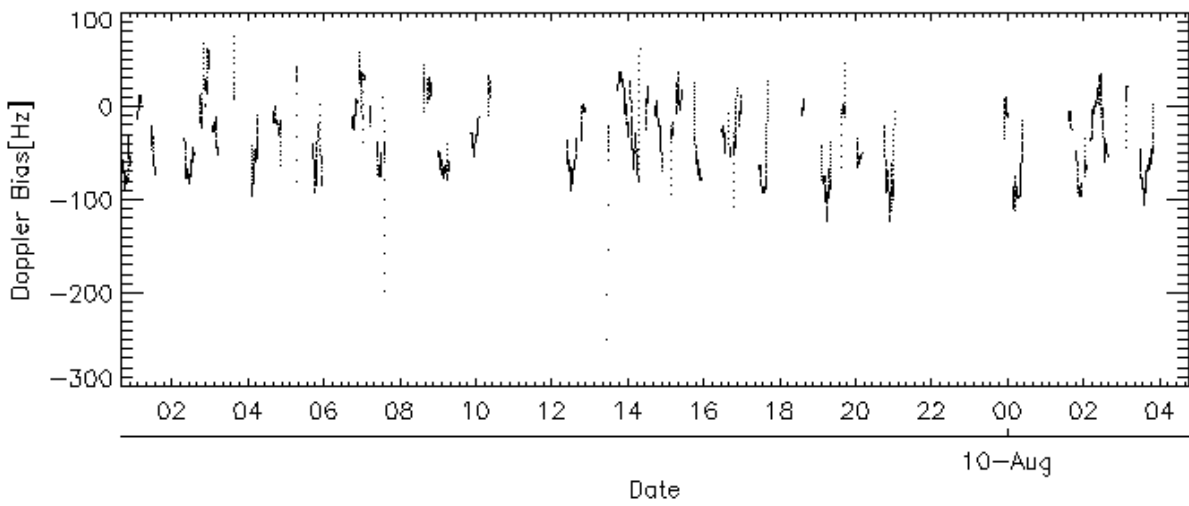
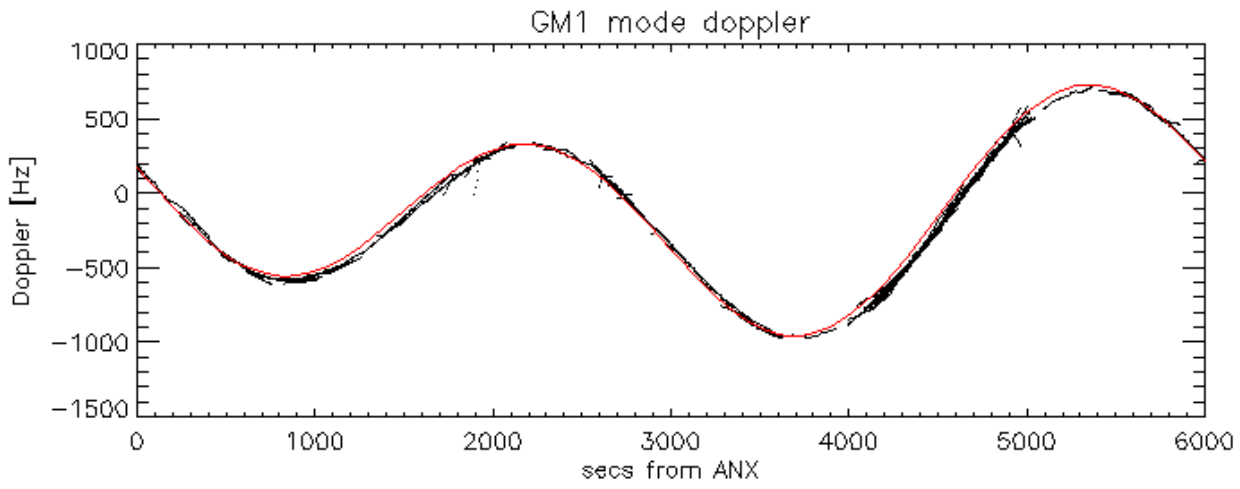
3.5. Residual Doppler Centroid evolution vs. time of the day

After the changes in the AOCS software on December 2003, the discontinuity in the ASAR Doppler Centroid frequency, previously observed every day at around 14:00 UTC, has been removed and the constant bias reduced by about 50 Hz.

The plot on the top shows the WV Doppler frequency (top) with respect to the expected frequency (in red) and the residual Doppler (bottom) versus the time of the day (UTC time) for data acquired July 2004.

The plot on the bottom shows the same information but for data acquired in GMM. As it can be observed, the bias is reduced and the discontinuity removed.





4. IRF ANALYSIS

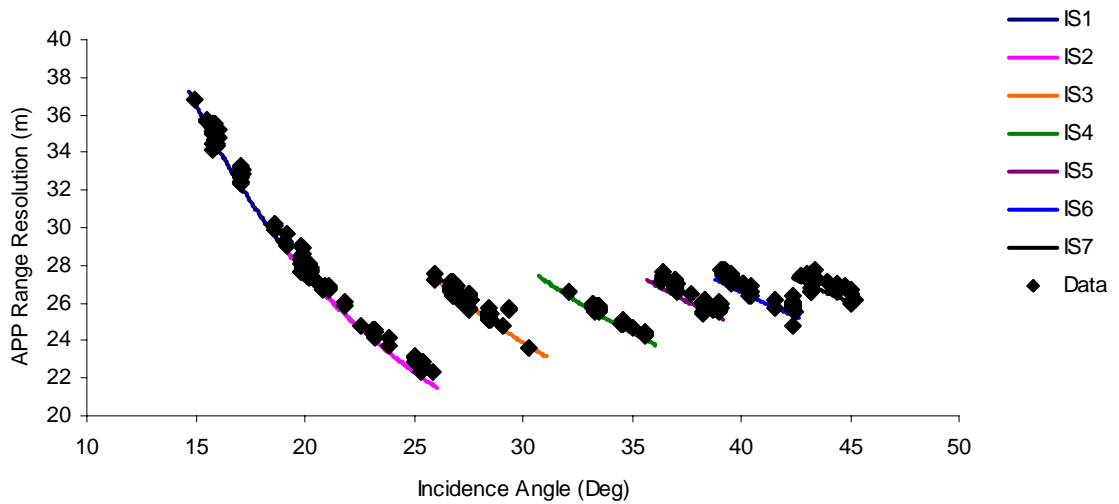
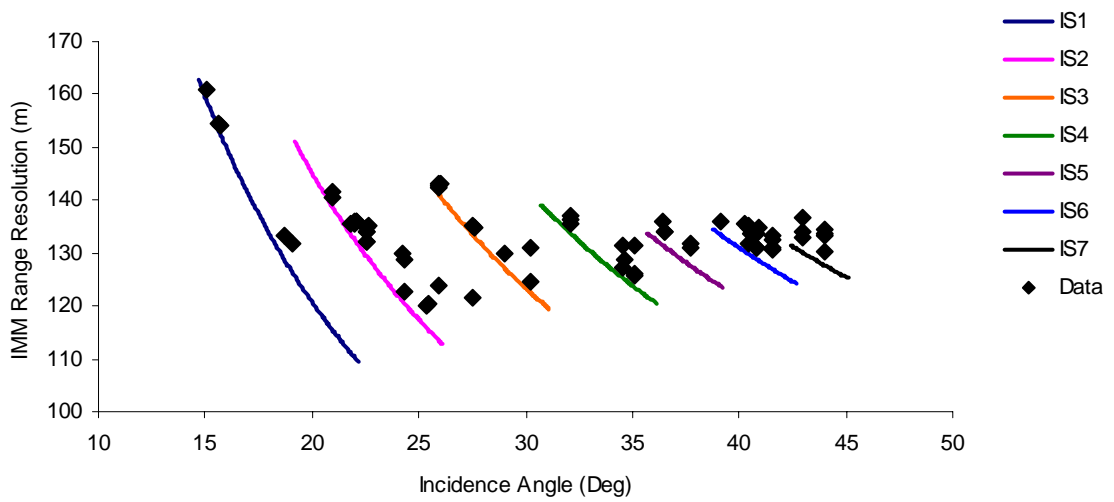
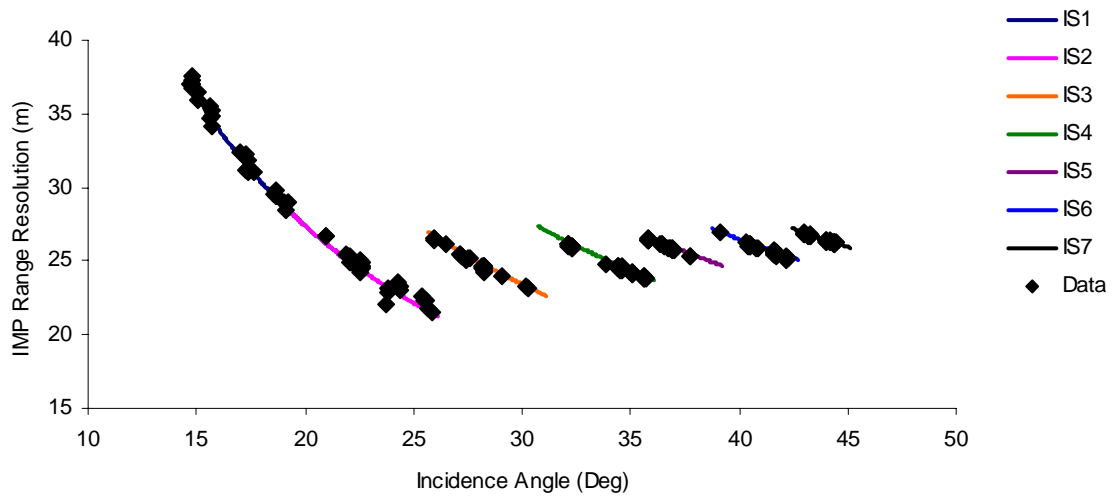
The analysis of the impulse response function over the transponders is used to characterize the products in term of spatial resolution and Impulse Response Function (IRF) parameters (PSLR, ISLR, SSLR) as well as to monitor the products absolute calibration factor. ASAR transponders as well as Radarsat transponders are used. The analysis is performed for all the modes, beams and polarisations. The table below shows the relative Radar Cross Section (RCS) per mode, beam and set of transponders. Values provided per sub-swath correspond to the mean absolute calibration error. Values provided per all swaths correspond to the mean error value and the corresponding standard deviation. All values are in dB.

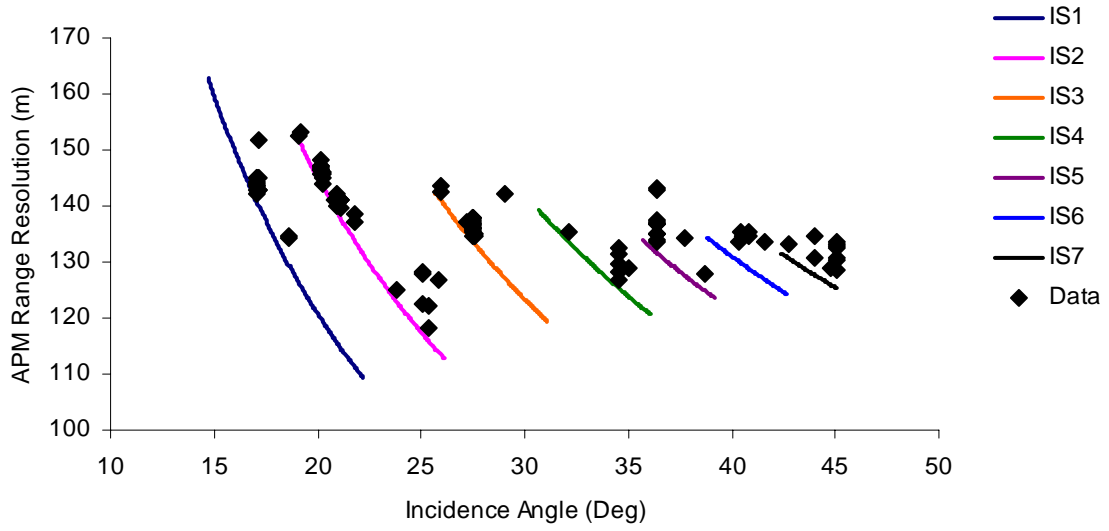
Product Type	Transponder	Relative RCS [dB]							
		All Swaths	IS1	IS2	IS3	IS4	IS5	IS6	IS7
IMP	All	0.76±1.01	0.93	0.16	0.97	0.53	1.28	0.84	0.88
	ASAR	0.23±0.41	0.22	0.03	0.10	0.31	0.15	0.59	0.40
	Radarsat	1.20±1.14	1.54	0.67	1.55	0.64	1.85	1.06	1.11
IMS	All	0.23±0.92							
IMM	All	0.79±0.95							
APP	All	0.61±0.94	0.20	0.49	0.64	0.92	0.39	0.91	0.84
	ASAR	-0.33±0.52	0.02	-0.24	0.09	-0.55	-0.84	-0.32	-0.61
	Radarsat	0.76±0.91	0.22	0.71	0.69	1.30	0.53	1.19	0.99
APS	All	0.06±1.03							
APM	All	0.28±0.90							

The tables below show IRF parameters measured per different product types.

Product Type	Azimuth Res (m)	Range Res (m)	ISLR (dB)	PSLR (dB)	SSLR (dB)	No of Results
IMP	22.07±0.44	Fig 1(a)	-13.15±1.44	-16.65±0.88	-22.45±1.83	183
IMG	22.16±0.47	22.7 - 35.4	-13.32±0.72	-16.83±0.99	-23.21±1.50	33
IMS	4.75±0.02 5.57±0.06	9.44±0.06	-14.35±0.28	-19.38±0.66	-28.41±0.85	44
IMM	146.5±3.6	Fig 1(b)	-5.96±3.37	-16.02±2.14	-15.34±4.01	69
APP	27.67±0.81	Fig 1(c)	-12.16±1.66	-18.97±0.87	-25.57±2.72	377
APG	27.74±0.49	23.2 - 30.3	-13.04±0.42	-19.28±0.80	-27.44±1.58	20
APS	5.13±1.72	8.40±0.11	2.88±2.35	-2.51±1.35	-17.41±4.23	58
APM	143.6±3.7	Fig 1(d)	-6.16±6.15	-16.58±1.86	-16.32±6.17	102

Product Type	Range Res [m]	Az. Res [m]	PSLR Rg. [dB]	PSLR Az. [dB]	Relative RCS [dB]
WSM	122.23 (Rg.dependent)	108.51±5.09	- 19.99±1.89	- -19.38±2.45	-0.20±0.43





4. ELEVATION ANTENNA PATTERN MONITORING

No updates in the elevation antenna pattern performed during this period. The table below lists the most recent updates.

Beam	Pol	RECENT ELEVATION ANTENNA PATTERN UPDATES		
SS1	HH	27/08/2003		06/04/2004
SS1	VV	27/08/2003		06/04/2004
IS1	HH		09/12/2003	
IS1	VV		09/12/2003	06/04/2004
IS1	HV			
IS1	VH		09/12/2003	06/04/2004
IS2	HH			06/04/2004
IS2	VV		09/12/2003	06/04/2004
IS2	HV			06/04/2004
IS2	VH			06/04/2004
IS3_SS2	HH	27/08/2003	09/12/2003	
IS3_SS2	VV	27/08/2003		
IS3_SS2	HV			
IS3_SS2	VH			
IS4_SS3	HH			
IS4_SS3	VV			
IS4_SS3	HV			06/04/2004
IS4_SS3	VH			06/04/2004
IS5_SS4	HH	27/08/2003		06/04/2004
IS5_SS4	VV	27/08/2003		
IS5_SS4	HV			06/04/2004
IS5_SS4	VH			06/04/2004
IS6_SS5	HH			
IS6_SS5	VV			
IS6_SS5	HV			06/04/2004
IS6_SS5	VH			06/04/2004
IS7	HH			
IS7	VV			
IS7	HV			
IS7	VH			

5. AUXILIARY FILES UPDATES

The most recent updates of auxiliary files are listed below in chronological order:

[ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000](#)

Updated elevation patterns for: SS1 HH-VV, IS1 VV-VH, IS2 HH-VV-HV-VH, IS4 HV-VH, IS5 HH-HV-Vh, IS6 HV-VH

[ASA_XCA_AXVIEC20040326_190217_20030211_000000_20041231_000000](#)

Inserted calibration constant for GMM products: 73.4 dB for HH and 74.0 dB for VV.

[ASA_CON_AXVIEC20040322_164757_20021017_130000_20041231_000000](#)

Same as last update (20040308): Updated AP Eq. Energy values (different per each polarisation). Changed AP normalisation method from reference energy to equivalent energy. Enable DAR for GM.

[ASA_CON_AXVIEC20040308_103426_20021017_130000_20041231_000000](#)

Updated AP Eq. Energy values (different per each polarisation). Changed AP normalisation method from reference energy to equivalent energy. Enable DAR for GM.

[ASA_INS_AXVIEC20031212_122530_20020815_131000_20021017_162400](#)

SWST bias updated.

[ASA_CON_AXVIEC20031212_122409_20021017_130000_20041231_000000](#)

End validity date extended till 31-12-2004

[ASA_INS_AXVIEC20031212_105841_20021017_162400_20021030_110000](#)

SWST bias updated

[ASA_CON_AXVIEC20031212_105603_20021017_130000_20031231_000000](#)

Dates adjusted to previous ASA_CON_AX version from 09-09-03.

[ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000](#)

End validity time extended until 31 December 2004. Elevation antenna patterns updated for: IS1 VV, IS1 HH, IS1 VH, IS2 VV and SS2_IS3 HH.

[ASA_INS_AXVIEC20031209_113421_20030211_000000_20041231_000000](#)

SWST Bias updated. End validity time extended until 31 December 2004.

[ASA_INS_AXVIEC20031209_113259_20021030_110000_20030211_000000](#)

SWST Bias updated

[ASA_XCH_AXVIEC20031209_112947_20020301_000000_20041231_000000](#)

End validity time extended until 31 December 2004

[ASA_CON_AXVIEC20031209_112721_20020301_000000_20041231_000000](#)

End validity time extended until 12 December 2004