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# ASAR CYCLIC REPORT

# JULY-AUGUST-SEPTEMBER 2004

# CYCLES 29 & 30

# PUBLIC SUMMARY


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# 1. EXECUTIVE SUMMARY

This document summarises the instrument and product quality status as derived from data acquired since the beginning of July until the end of September 2004.

No major anomalies have been experienced during this period. 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

The new events with respect to the previous report are highlighted in blue.

| 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. |
| 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 |
| 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 Tile D3 power loss in Tx/H |
| 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 |
| EN-UNA-2004/0229 | 12 Sep 2004 10:54:47<br>Orbit=13260 | 12 Sep 2004 11:12:40<br>Orbit=13260 | No | Antenna Reset due to loss of tile D4 in Tx/H |
| EN-UNA-2004/0246 | 23 Sep 2004 06:13:17<br>Orbit=13415 | 23 Sep 2004 09:55:38<br>Orbit=13417 | No | ASAR to HTR/Ref due to power off for PSUs of TILE D2 |
| EN-UNA-2004/0252 | 26 Sep 2004 21:24:58<br>Orbit=13467 | 27 Sep 2004 11:02:04<br>Orbit=13475 | No | ASAR was in HEATER/REFUSE Mode owing to all PSU's on tile B4 reported off |

## 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 online at http://earth.esa.int/pcs/envisat/asar/disclaimer.

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

- From 16-Sep-2004 03:36:39UTC to 16-Sep-2004 08:53:15 UTC
  Problem Desrciption
  Degraded radiometric quality due to an instrument anomaly.
  Affected products
  All ASAR products, including level 0 products

- From 12-Sep-2004 03:46:00 UTC to 12-Sep-2004 12:40:00 UTC
  Problem Desrciption
  Degraded radiometric quality due to an instrument anomaly.
  Affected products
  All ASAR products, including level 0 products

- From 12-Aug-2004 13:53:54 UTC to 12-Aug-2004 19:09:50 UTC
  Problem Desrciption
  Degraded radiometric quality due to an instrument anomaly.
  Affected products
  All ASAR products, including level 0 products

- From 14-AUG-2004 07:36:00 UTC to 17-AUG-2004 10:57:45 UTC
  Problem Desrciption
  Degraded radiometric quality due to an instrument anomaly.
  Affected products
  All ASAR products, including level 0 products

## 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:<br>- Antarctica extended (1)<br>- Artic (2)<br>- Greenland and Greenland Sea (4)<br>- Labrador Sea and North of Canada (3,4)<br>(1) Kara Sea (4)<br>(2) Baffin Bay (4)<br>- Golf of Mexico & Caribbean Sea (5)<br>VV:<br>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 then GM) will be solved on data acquired since 21 July 2004.

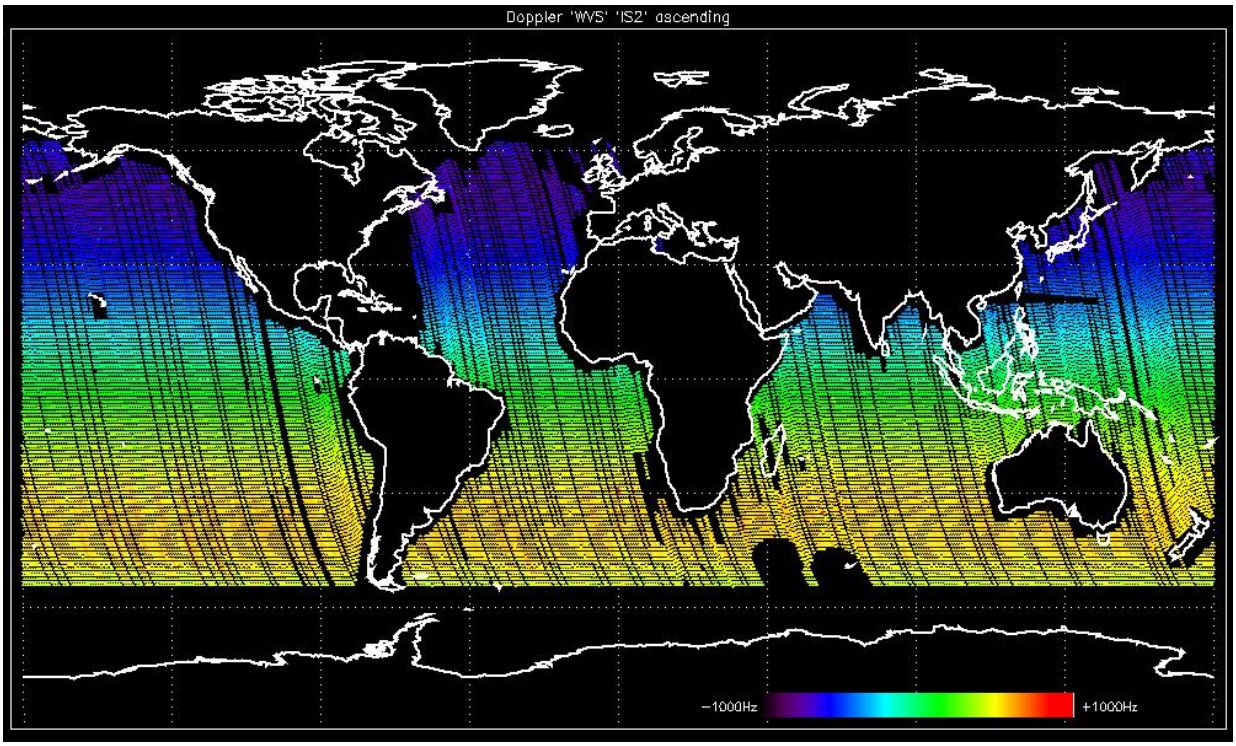
# 3. DOPPLER MONITORING

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.

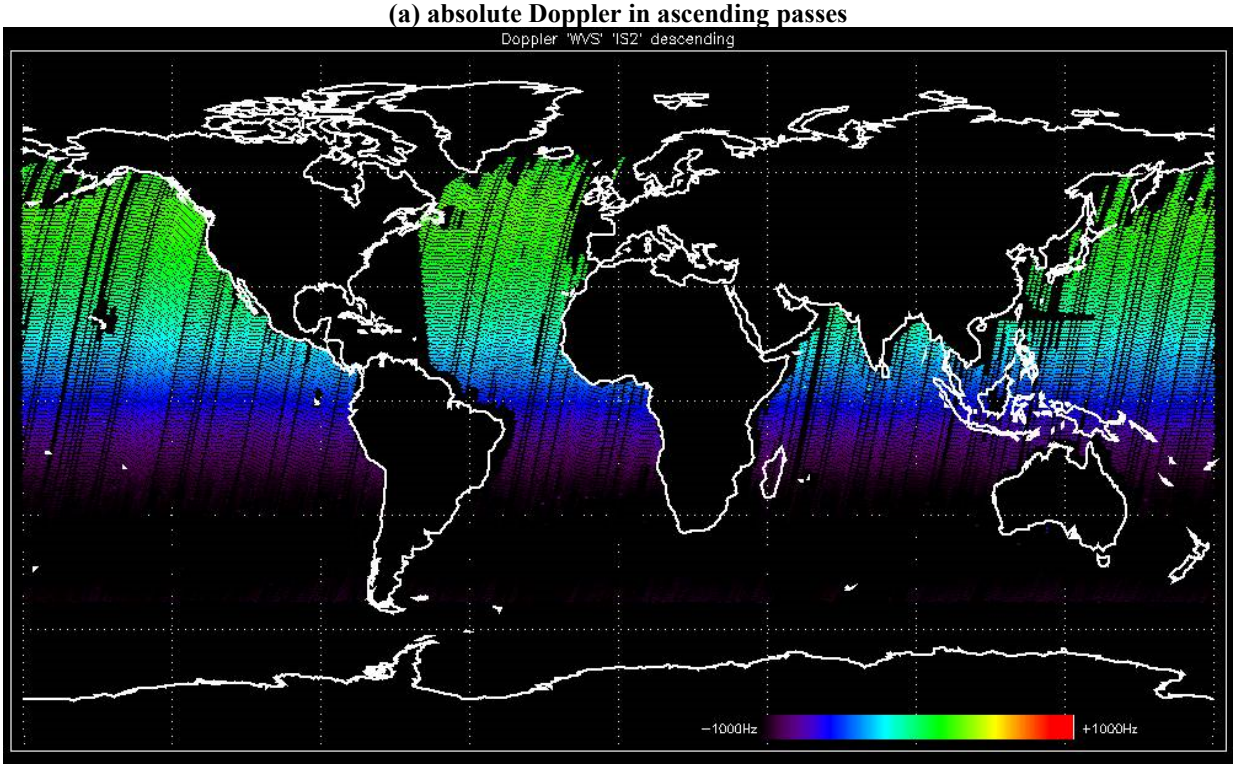
A Doppler discontinuity, previously observed daily at ~ 15:00 hours, has also been removed with the AOCS s/w upgrade.

The Envisat Orbit Control Manoeuvres (OCM) could affect the platform attitude stability even few ours after the burst with a direct impact of the Doppler centroid frequency evolution. An updated list of the OCM can be found at http://nng.esoc.esa.de/envisat/ENVmano.html.

# 3.1. Absolute WV-IS2 Doppler Centroid evolution



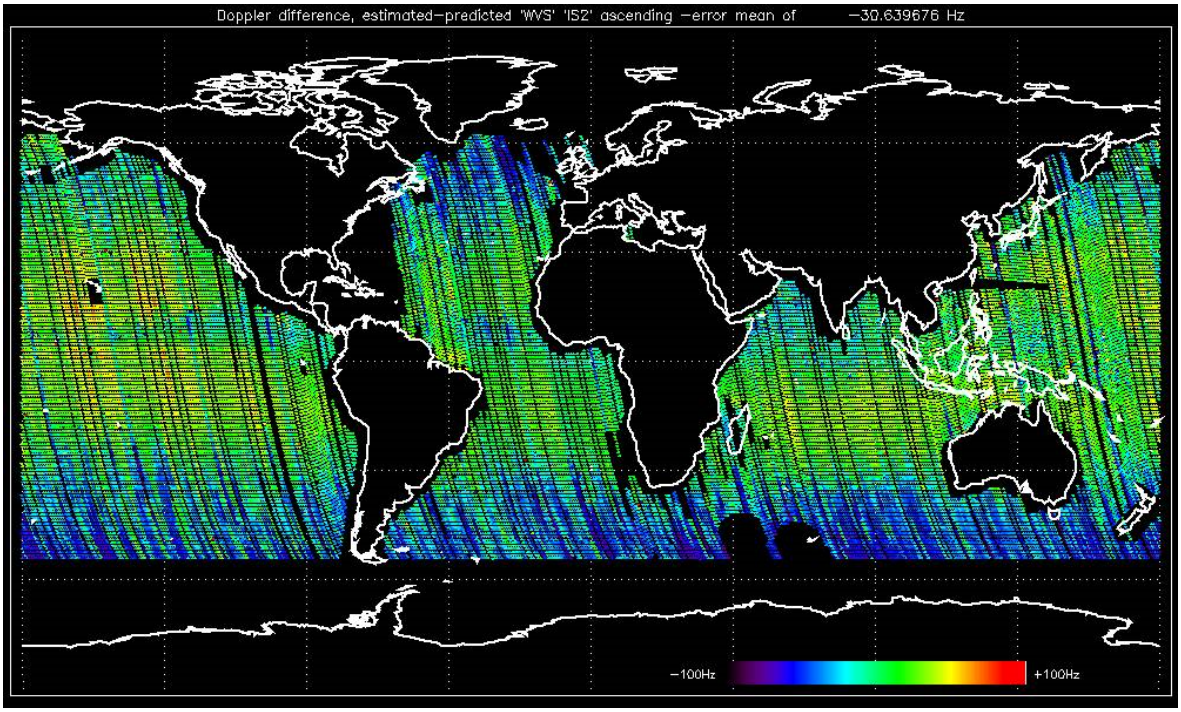

**(a) absolute Doppler in ascending passes**



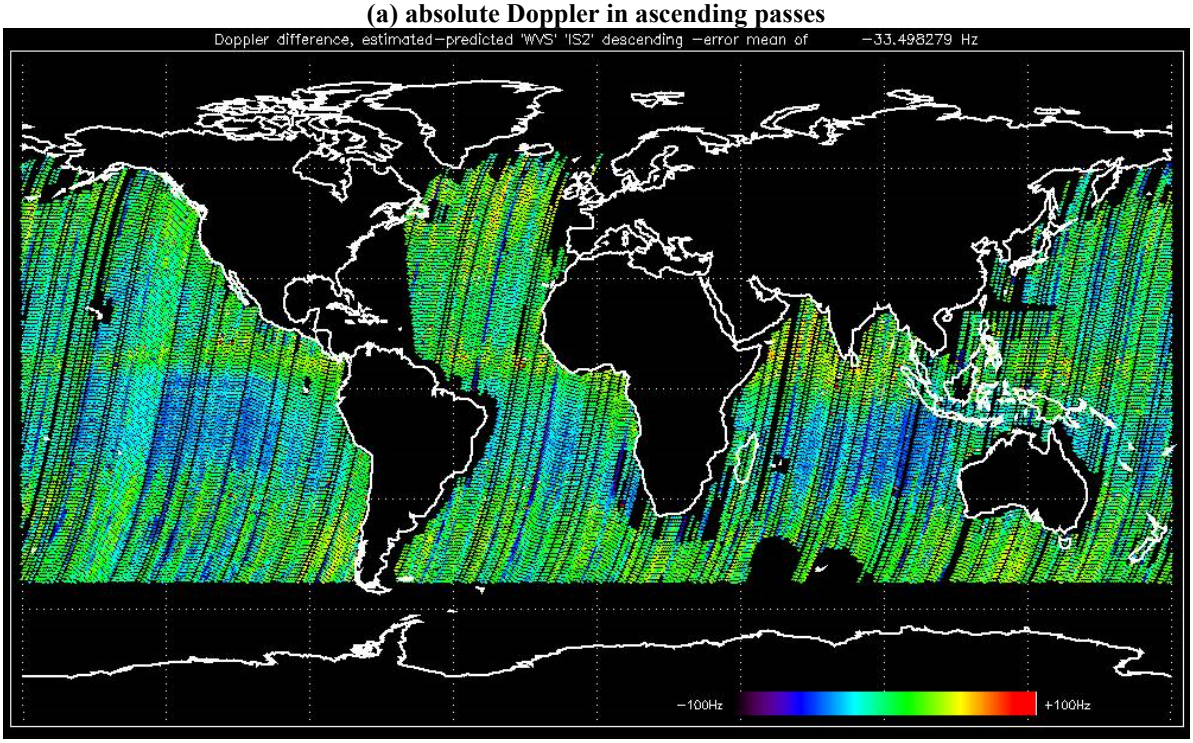

**(b) absolute Doppler in descending passes**

**figure 1: Absolute Doppler evolution over the world**

# 3.2. Residual WV-IS2 Doppler Centroid evolution




**(a) absolute Doppler in ascending passes**

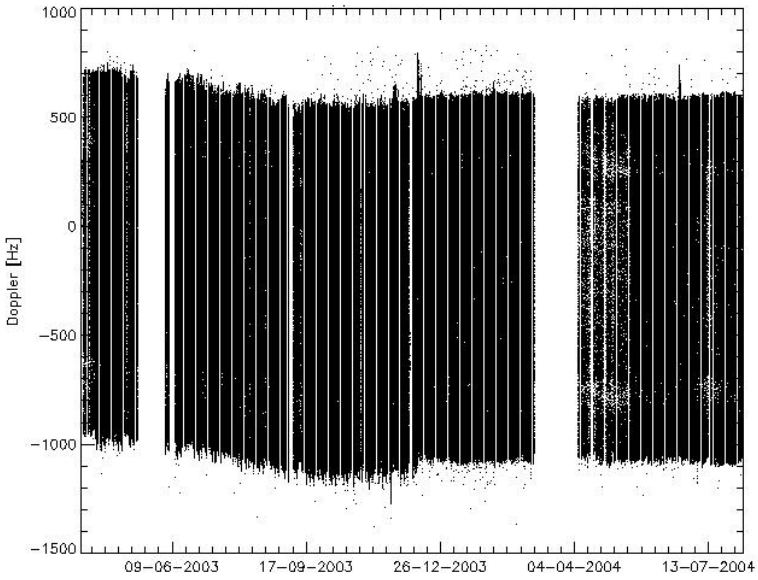



**(b) absolute Doppler in descending passes**

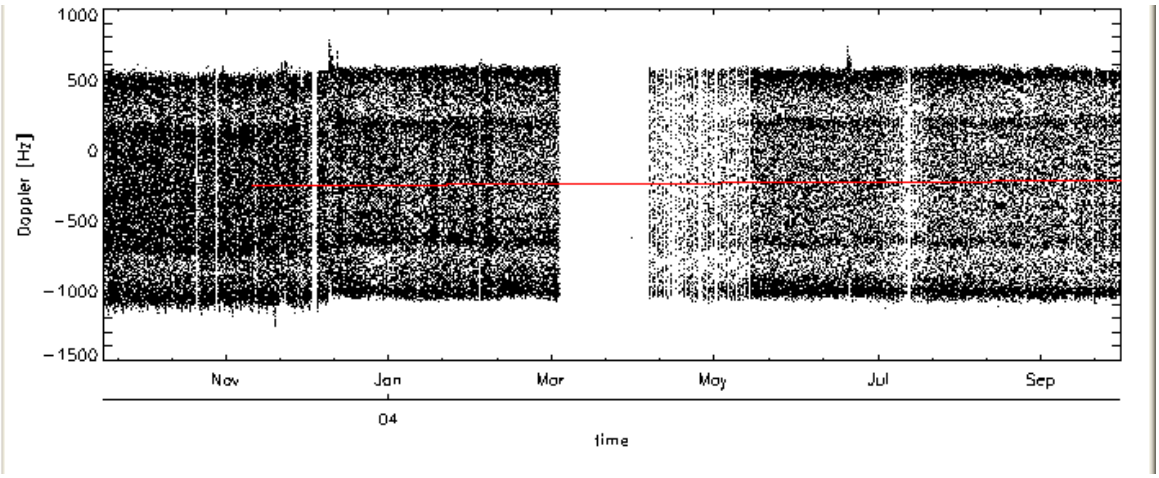
**figure 2: Absolute Doppler evolution over the world**

# 3.3. Absolute WV-IS2 Doppler Centroid evolution in time

As observed in figure 3.a, 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.




**(a) Impact of the AOCS s/w upgrade of 11-DEC-2003 in the Doppler evolution**




**(b)Absolute Doppler evolution since 01-SEP-2003**

**figure 3: Absolute Doppler evolution in time**

## 3.4. Absolute WV-IS2 Doppler Centroid evolution vs ANX

The figure 4 shows the Doppler evolution (WV, IS2, VV) versus the elapsed seconds from the ascending node (ANX) for data acquired since 01-SEP-2004 till 30-SEP-2004. Theoretical Doppler is in red. Outliers correspond to data acquired during orbit manoeuvres.

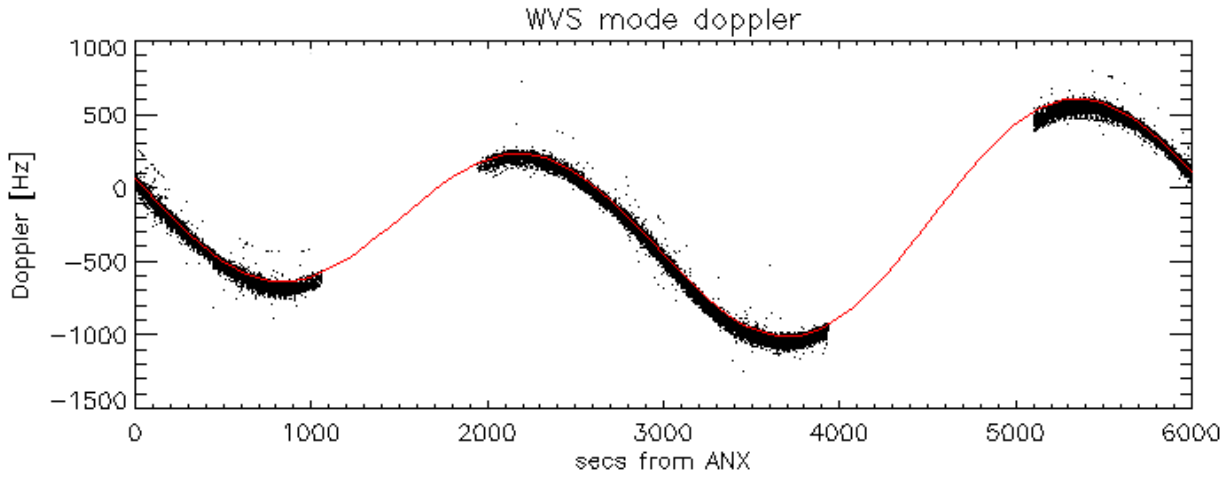


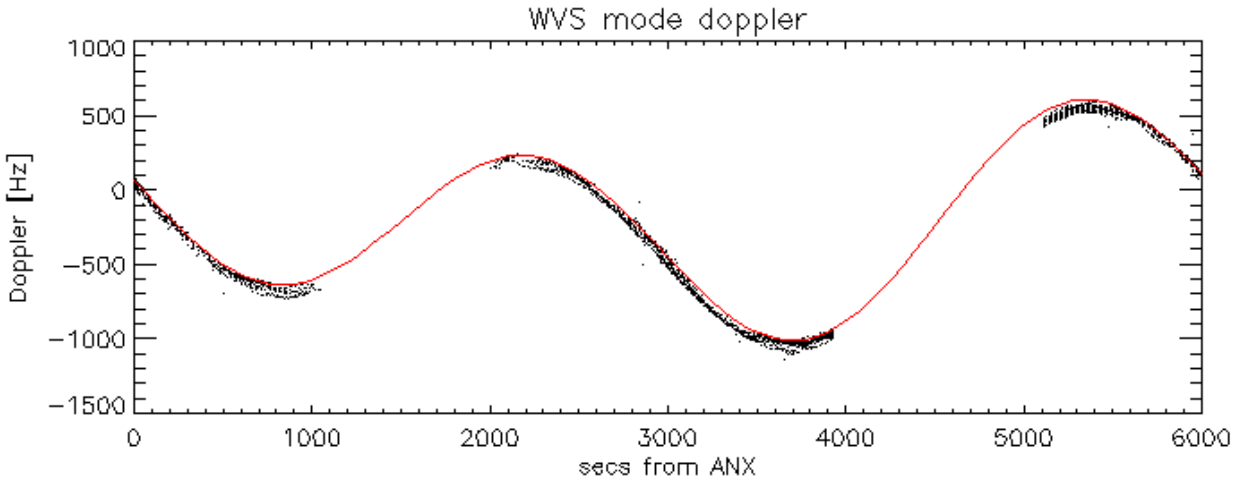

**figure 4: Absolute Doppler evolution vs time from ANX**

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

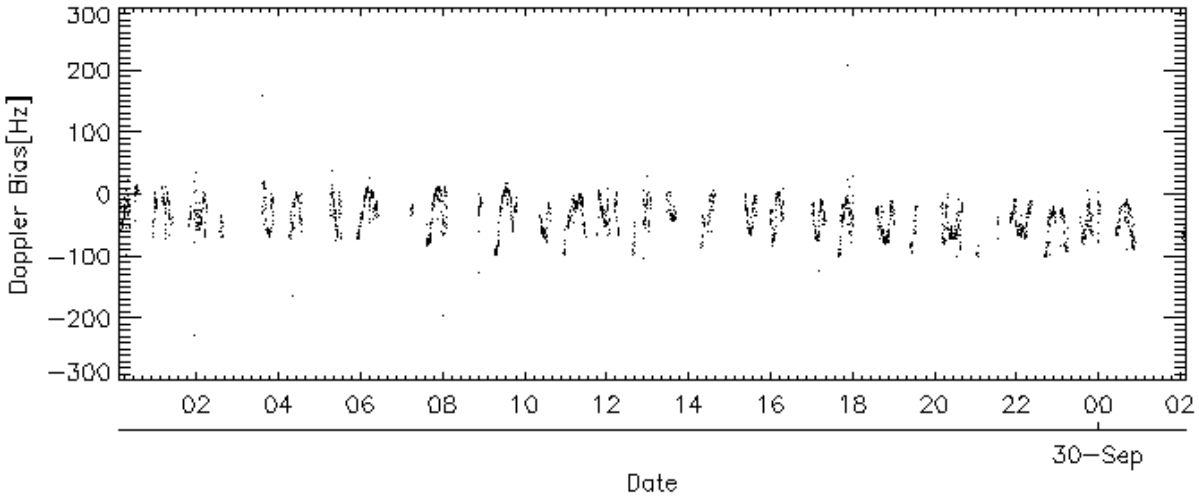
After the changes in the AOCS software on December 2003, the discontinuity in the ASAR Doppler Centroid frequency, previously observed every day at around 14:00 UTC, has been removed and the constant bias reduced by about 50 Hz.

The figure 5 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 figure 6 shows the same information but for data acquired in GMM. As it can be observed, the bias is reduced and the discontinuity removed.



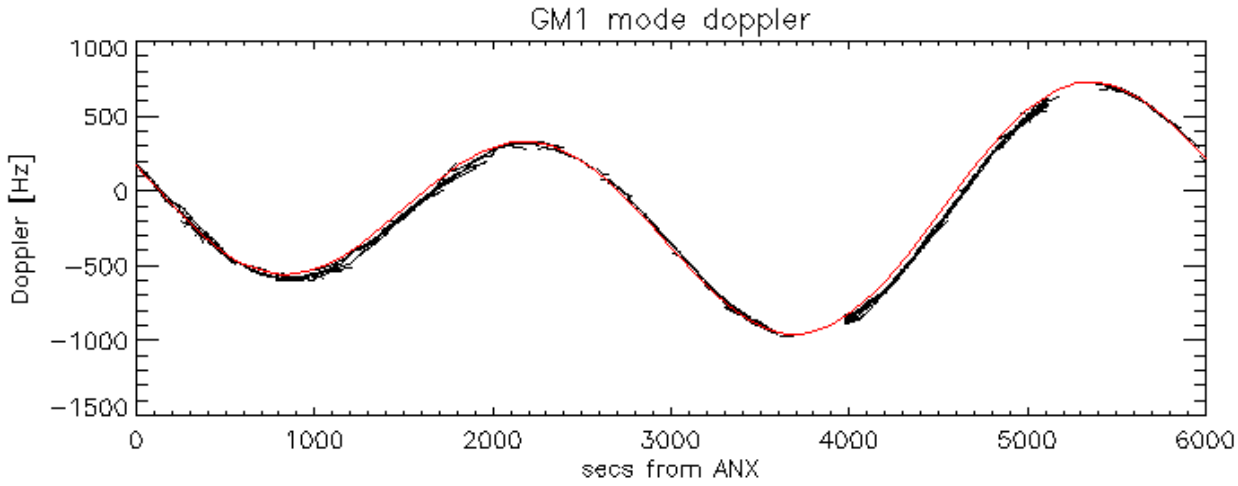

**(a) Doppler evolution vs elapsed seconds since ANX**



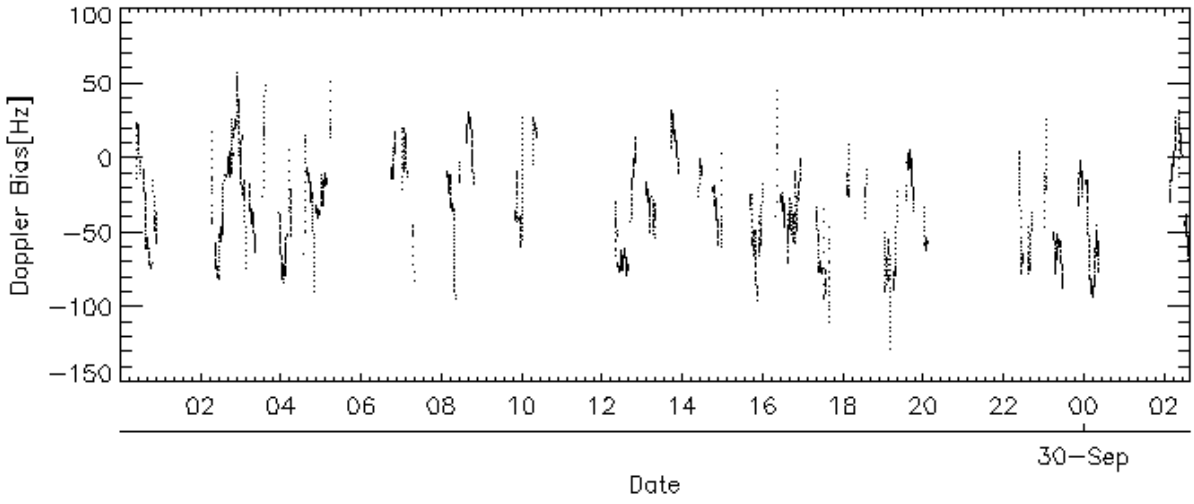

**(b) residual Doppler evolution versus time of day**

**figure 5: Residual Doppler centroid evolution for WVS data**

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




**(a) Doppler evolution versus elapsed seconds since ANX**




**(b) residual Doppler evolution versus time of day**

**figure 6: Residual Doppler centroid evolution for GMM data**

# 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)[1] 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.

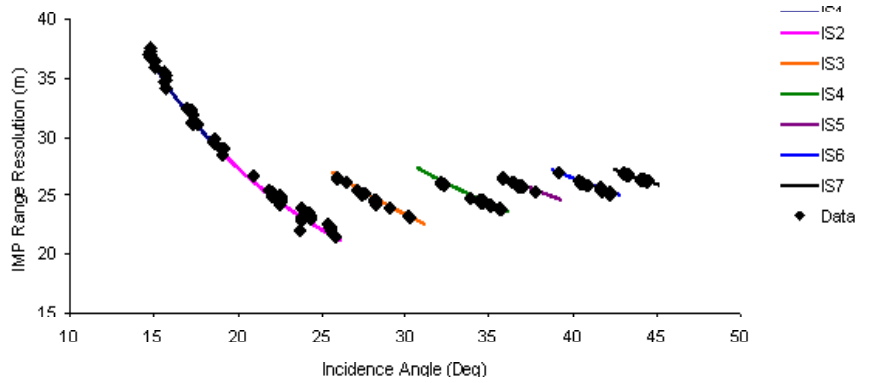
| Product Type | Transponder | Relative RCS [dB] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | All Swaths | IS1 | IS2 | IS3 | IS4 | IS5 | IS6 | IS7 |
| IMP | All | 0.77±1.00 | 0.93 | 0.18 | 0.97 | 0.51 | 1.28 | 0.90 | 0.93 |
| | ASAR | 0.23±0.41 | 0.22 | 0.03 | 0.10 | 0.31 | 0.15 | 0.59 | 0.40 |
| | Radarsat | 1.18±1.12 | 1.54 | 0.63 | 1.55 | 0.60 | 1.80 | 1.15 | 1.17 |
| IMS | All | 0.23±0.92 | | | | | | | |
| IMM | All | 0.77±0.95 | | | | | | | |
| APP | All | 0.62±0.93 | 0.18 | 0.49 | 0.64 | 0.94 | 0.39 | 0.90 | 0.83 |
| | ASAR | -0.33±0.52 | 0.02 | -0.24 | 0.09 | -0.55 | -0.84 | -0.32 | -0.61 |
| | Radarsat | 0.75±0.90 | 0.22 | 0.70 | 0.69 | 1.26 | 0.53 | 1.13 | 0.97 |
| APS | All | 0.07±1.04 | | | | | | | |
| APM | All | 0.28±0.90 | | | | | | | |

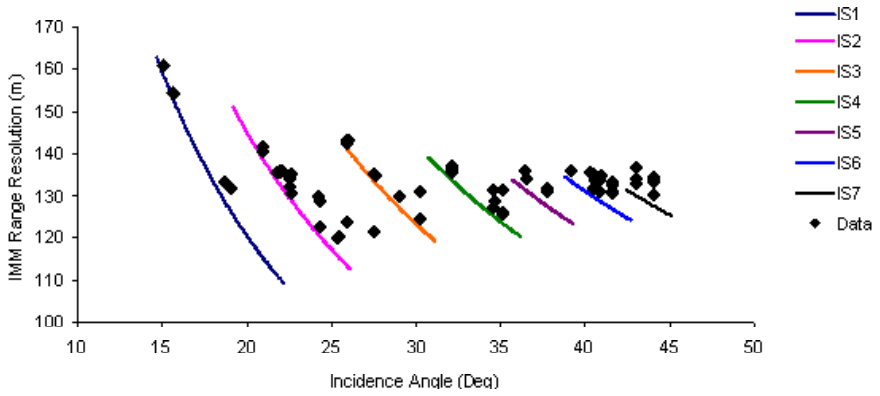
The tables below show IRF parameters measured per different product types.

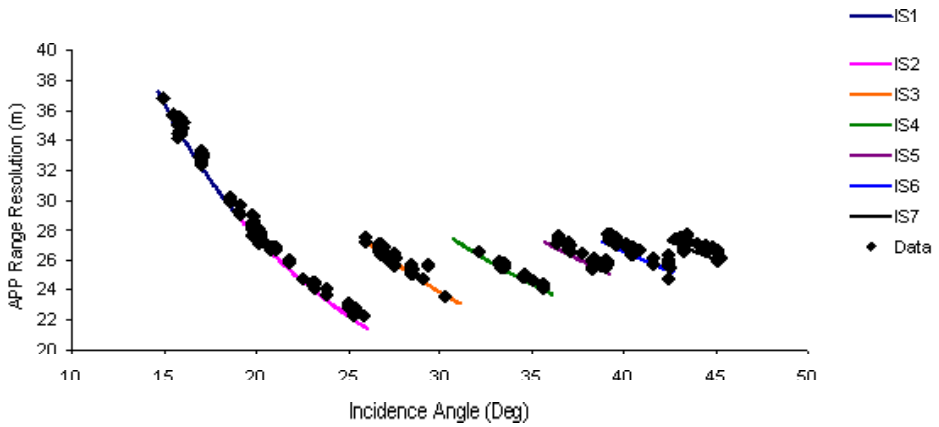
| Product Type | Azimuth Res (m) | Range Res (m) | ISLR (dB) | PSLR (dB) | SSLR (dB) | No of Results |
|---|---|---|---|---|---|---|
| IMP | 22.06±0.44 | Fig 1(a) | -13.16±1.42 | -16.64±0.88 | -22.44±1.82 | 191 |
| IMG | 22.16±0.47 | 22.7 - 35.4 | -13.32±0.72 | -16.83±0.99 | -23.21±1.50 | 33 |
| IMS | 4.75±0.02<br>5.57±0.06 | 9.44±0.06 | -14.35±0.28 | -19.29±0.66 | -28.41±0.85 | 44 |
| IMM | 146.4±3.6 | Fig 1(b) | -6.01±3.37 | -16.04±2.13 | -15.40±4.01 | 70 |
| APP | 27.67±0.80 | Fig 1(c) | -12.21±1.64 | -19.00±0.87 | -25.57±2.73 | 403 |
| APG | 27.74±0.49 | 23.2 - 30.3 | -13.04±0.42 | -19.28±0.80 | -27.44±1.58 | 20 |
| APS | 5.00±1.77 | 8.40±0.11 | 3.07±2.44 | -2.43±1.36 | -17.17±4.27 | 61 |
| APM | 143.6±3.7 | Fig 1(d) | -6.16±6.15 | -16.58±1.86 | -16.32±6.17 | 102 |

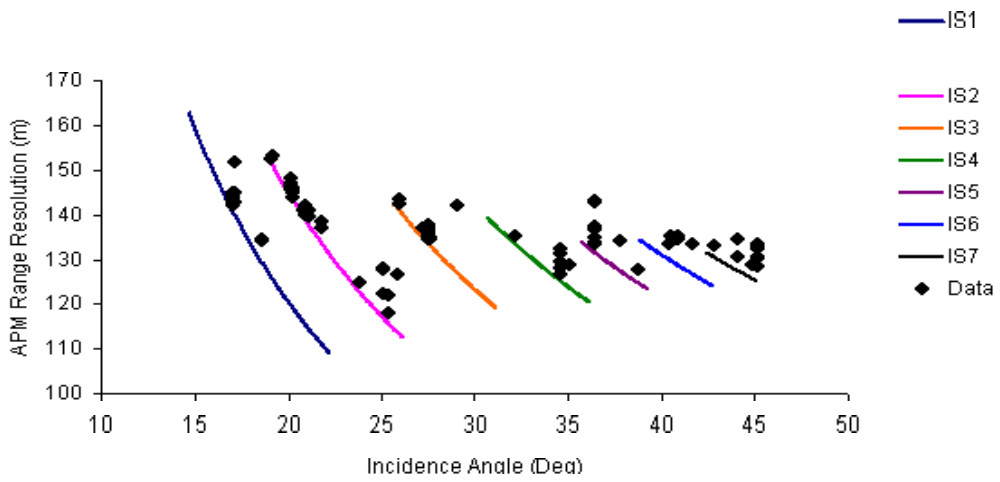
[1]The relative RCS is defined as the difference between the nominal RCS ans the measured RCS.

| 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 |


IMP Range Resolution (m)
Incidence Angle (Deg)
IS2
IS3
IS4
IS5
IS6
IS7
Data


IMM Range Resolution (m)
Incidence Angle (Deg)
IS1
IS2
IS3
IS4
IS5
IS6
IS7
Data


APP Range Resolution (m)
Incidence Angle (Deg)
IS1
IS2
IS3
IS4
IS5
IS6
IS7
Data


APM Range Resolution (m)
170
160
150
140
130
120
110
100
10
15
20
25
30
35
40
45
50
Incidence Angle (Deg)
IS1
IS2
IS3
IS4
IS5
IS6
IS7
Data


WSM Range resolution
rg. resolution[m]
160
150
140
130
120
110
100
90
80
15
20
25
30
35
40
45
incidence angle

# 4. ELEVATION ANTENNA PATTERN MONITORING

## 4.1. Most recent elevation antenna pattern updates

The elevation antenna pattern has been updated for SS1 HH, IS3_SS2 HH, IS3_SS2 VV and IS4_SS3 HH on 12 August 2004. The table below show the most recent updates (since Aug.2003) for each beam and polarisation.

| BEAM | POL | RECENT ELEVATION ANTENNA PATTERN UPDATES | | | |
|---|---|---|---|---|---|
| SS1 | HH | 27/08/2003 | | 06/04/2004 | 12/08/2004 |
| 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 | | 12/08/2004 |
| IS3_SS2 | VV | 27/08/2003 | | | 12/08/2004 |
| IS3_SS2 | HV | | | | |
| IS3_SS2 | VH | | | | |
| IS4_SS3 | HH | | | | 12/08/2004 |
| 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 | | | | |

## 4.2. History of elevation antenna pattern updates

The table below summarises the evolution of the elevation antenna pattern used for processing since August 2002.

The files are available on line at: **http://earth.esa.int/services/auxiliary_data/asar/**

The source information indicates whether the pattern has been derived from data acquired over the Rain Forest (“RF”) or whether it has been derived from antenna synthesis using results from Module Stepping acquisitions (“SYN”).

Please note that pre-launch antenna pattern where used before the first ASA_XCA_1P update.

Please note that the table indicates for each beam, in which file the update took place. Any file created after this date will include that update unless a new file is specified for the beam. For instance, the pattern for IS3_SS2 VV was updated on 27 August 2003. The file created on 9 December 2003 (when the IS1 VV pattern was updated) will include the same pattern for IS3_SS2 VV as in the file of 27 August 2003, since the table does no indicate any further update for the IS3_SS2 VV pattern.

| ASAR ELEVATION ANTENNA PATTERNS UPDATES IN THE ASAR EXTERNAL CALIBRATION FILE | | | | | |
|---|---|---|---|---|---|
| **Swath & polarisation** | **Source** | **Update time** (file used in operations since 1 day after this date) | **File Name** | **Applicable to data acquired between:** | |
| | | | | **Start** | **Stop** |
| IS1 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | NA[1] | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20021122 | ASA_XCA_AXVIEC20021122_130838_20020413_000000_20021231_00000[2] | 20020413 | 20021231 |
| | RF | 20031209 | ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS1 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20031209 | ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS1 HV | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |

[1] A corrupted IS1 VV pattern was included into the ASA_XCA_1P file updated of 11 Nov. 2002

[2] The corrupted IS1 VV pattern in the operational ASA_XCA_1P file was corrected on 22 Nov. 2002. Please note that the IS1 VV pattern in ASA_XCA_AXVIEC20021122_130838_20020413_000000_20021231_00000 is the same as in ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000

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|---|---|---|---|---|---|
| IS1 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20031209 | ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS2 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20031209 | ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS2 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS2 HV | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS2 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS3_SS2 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20021018 | ASA_XCA_AXVIEC20021018_121708_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |

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|---|---|---|---|---|---|
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| | RF | 20040812 | ASA_XCA_AXVIEC20040812_170224_20040412_000000_20041231_000000 | 20040412 | 20041231 |
| IS3_SS2 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| | RF | 20031209 | ASA_XCA_AXVIEC20031209_113559_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| | RF | 20040812 | ASA_XCA_AXVIEC20040812_170224_20040412_000000_20041231_000000 | 20040412 | 20041231 |
| IS3 HV | SYN. | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| IS3 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| IS4_SS3 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20021018 | ASA_XCA_AXVIEC20021018_121708_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| IS4_SS3 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20040812 | ASA_XCA_AXVIEC20040812_170224_20040412_000000_20041231_000000 | 20040412 | 20041231 |

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|---|---|---|---|---|---|
| IS4 HV | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS4 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS5_SS4 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20021018 | ASA_XCA_AXVIEC20021018_121708_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| IS5_SS4 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS5 HV | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS5 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS6_SS5 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20021018 | ASA_XCA_AXVIEC20021018_121708_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |

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|---|---|---|---|---|---|
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| IS6_SS5 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| IS6 HV | SYN. | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS6 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| IS7 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| IS7 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| IS7 HV | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| IS7 VH | RF | 20021217 | ASA_XCA_AXVIEC20021217_150852_20020413_000000_20031231_000000 | 20020413 | 20031231 |
| SS1 VV | RF | 20020813 | ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000 | 20020413 | 20021231 |

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|---|---|---|---|---|---|
| | RF | 20021018 | ASA_XCA_AXVIEC20021018_121708_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| SS1 HH | RF | 20021107 | ASA_XCA_AXVIEC20021107_144746_20020413_000000_20021231_000000 | 20020413 | 20021231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_133024_20030428_000000_20031231_000000 | 20030428 | 20031231 |
| | RF | 20030801 | ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000 | 20020413 | 20030211 |
| | RF | 20030827 | ASA_XCA_AXVIEC20030827_140210_20030211_000000_20031231_000000 | 20030211 | 20031231 |
| | RF | 20040406 | ASA_XCA_AXVIEC20040406_160451_20030211_000000_20041231_000000 | 20030211 | 20041231 |
| | RF | 20040812 | ASA_XCA_AXVIEC20040812_170224_20040412_000000_20041231_000000 | 20040412 | 20041231 |

# 5. ASAR AUXILIARY FILES UPDATES

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

**ASA_XCA_AXVIEC20040812_170224_20040412_000000_20041231_000000**
Update of elevation antenna pattern for: SS1_HH, SS2_IS3_HH, SS3_IS4_HH and SS2_IS3_VV.

**ASA_INS_AXVIEC20040521_160843_20030211_000000_20041231_000000**
GM ISG increased by 1 for all sub-swaths

**ASA_CON_AXVIEC20040407_173947_20021017_130000_20041231_000000**
Increased GM SS3 HH gain (by decreasing 0.5 dB the Eq.Energy for GM SS3 HH)

**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