

ASAR MONTHLY REPORT

NOVEMBER 2004



PUBLIC SUMMARY

| | |
|--|---------------------------|
| prepared by/ <i>préparé par</i> | PCF/ASAR team |
| reference/ <i>référence</i> | ENVI-CLVL-EOPG-TN-04-0009 |
| issue/ <i>édition</i> | 1 |
| revision/ <i>révision</i> | 0 |
| date of issue/ <i>date d'édition</i> | 08-12-2004 |
| status/ <i>état</i> | Approved |
| Document type/ <i>type de document</i> | Technical Note |
| Distribution/ <i>distribution</i> | |

European Space Agency
Agence spatiale européenne

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1 EXECUTIVE SUMMARY

This document summarizes the instrument and product quality status as derived from data acquired since the beginning of October 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 4.

Radiometric stability is measured by means of ASAR and Radarsat transponders. Detailed results are provided in chapter 5.

An updated list of auxiliary data files is provided in chapters 6 and 7.

2 INSTRUMENT STATUS

No major anomalies experienced during this period.

Three 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
- TRM-06 in Tile A1: failed to transmit in V polarization since 17 November 2004

Please note that a single TRM transmit failures have no significant impact on the instrument performance nor on the antenna pattern radiation shape.

2.1 *Instrument unavailability*

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

| Unavailability report reference | Start | Stop |
|---------------------------------|--------------------------------------|--------------------------------------|
| EN-UNA-2004/0111 | 14/04/2004 02:45:00 | 14/04/2004 13:40:00 |
| EN-UNA-2004/0114 | 20/04/2004 08:15:46 | 20/04/2004 08:23:31 |
| EN-UNA-2004/0118 | 20/04/2004 10:00:54 | 20/04/2004 11:56:40 |
| EN-UNA-2004/0124 | 26/04/2004 21:32:03 | 27/04/2004 09:41:43 |
| EN-UNA-2004/0125 | 29/04/2004 08:32:08 | 29/04/2004 10:18:18 |
| EN-UNA-2004/0129 | 02/05/2004 21:32:47 | 03/05/2004 09:41:44 |
| EN-UNA-2004/0176 | 12/07/2004 11:21:46 | 12/07/2004 18:01:40 |
| EN-UNA-2004/0191 | 04/08/2004 09:19:00 | 04/08/2004 09:26:00 |
| EN-UNA-2004/0193 | 05/08/2004 23:07:33 | 05/08/2004 23:43:27 |
| EN-UNA-2004/0229 | 12/09/2004 10:54:47 | 12/09/2004 11:12:40 |
| EN-UNA-2004/0246 | 23/09/2004 06:13:17 | 23/09/2004 09:55:38 |
| EN-UNA-2004/0252 | 26/09/2004 21:24:58 | 27/09/2004 11:02:04 |
| EN-UNA-2004/0261 | 17/10/2004 02:28:31 | 17/10/2004 07:45:11 |
| EN-UNA-2004/0265 | 01/11/2004 05:00:40 | 01/11/2004 05:01:40 |
| EN-UNA-2004/0268 | 03/11/2004 09:59:30 Orbit = 14004 | 03/11/2004 10:04:58 Orbit = 14004 |
| EN-UNA-2004/0270 | 07/11/2004 03:41:28 Orbit=14054 | 07/11/2004 08:00:03 Orbit=14060 |
| EN-UNA-2004/0276 | 12/11/2004 21:46:59 Orbit = 14140 | 12/11/2004 23:43:46 Orbit = 14141 |

| | | |
|------------------|--------------------------------------|--------------------------------------|
| EN-UNA-2004/0281 | 16/11/2004 02:34:15 Orbit = 14185 | 16/11/2004 03:16:49 Orbit = 14186 |
| EN-UNA-2004/0290 | 21/11/2004 19:36:58 Orbit = 14267 | 21/11/2004 22:19:32 Orbit = 14269 |
| EN-UNA-2004/0299 | 29/11/2004 00:42:03 Orbit = 14370 | 29/11/2004 03:09:35 Orbit = 14372 |
| EN-UNA-2004/0307 | 05/12/2004 15:06:14 Orbit = 14465 | 05/12/2004 15:35:42 Orbit = 14465 |

2.2 *Data disclaimer*

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>.

During the reported period one data disclaimer has been rose.

- 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-2004 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.

- From 16-Sep-2004 03:36:39UTC to 16-Sep-2004 08:53:15 UTC

Problem Description:

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 Description:

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 Description:

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 Description:

Degraded radiometric quality due to an instrument anomaly.

Affected products:

All ASAR products, including level 0 products

- From 02-NOV-2004 14:17:25 UTC to 03-NOV-2004 10:04:58 UTC

Problem Description:

Degraded radiometric quality due to an instrument anomaly.

Affected products:

All ASAR products, including level 0 products

- From 05-DEC-2004 10:03:48 UTC to 05-DEC-2004 15:35:45 UTC

Problem Description:

Degraded radiometric quality due to an instrument anomaly.

Affected products:

All ASAR products, including level 0 products

- From 13-APR-2002 to 11-FEB-2003

Problem Description:

The absolute calibration factor annotated in all ASAR level 1 products acquired between 13-APR-2002 and 11-FEB-2003 and processed between 01-AUG-2003 and 29-NOV-2004 is not correct. These products with incorrect calibration factor annotated in the Main Processing Parameters ADS can be identified by checking the auxiliary files used for processing. The name of the auxiliary files used in the processing is provided in the product SPH (use “view as HTML” in EnviView to visualise them). Products with incorrect calibration factor have been processed with the following external calibration auxiliary file:

ASA_XCA_AXVIEC20030801_134802_20020413_000000_20030211_000000

The correct calibration factors for these products are provided in the following auxiliary file:

ASA_XCA_AXVIEC20041129_173057_20020413_000000_20030211_000000

available on line at: http://earth.esa.int/services/auxiliary_data/asar/

Affected products:

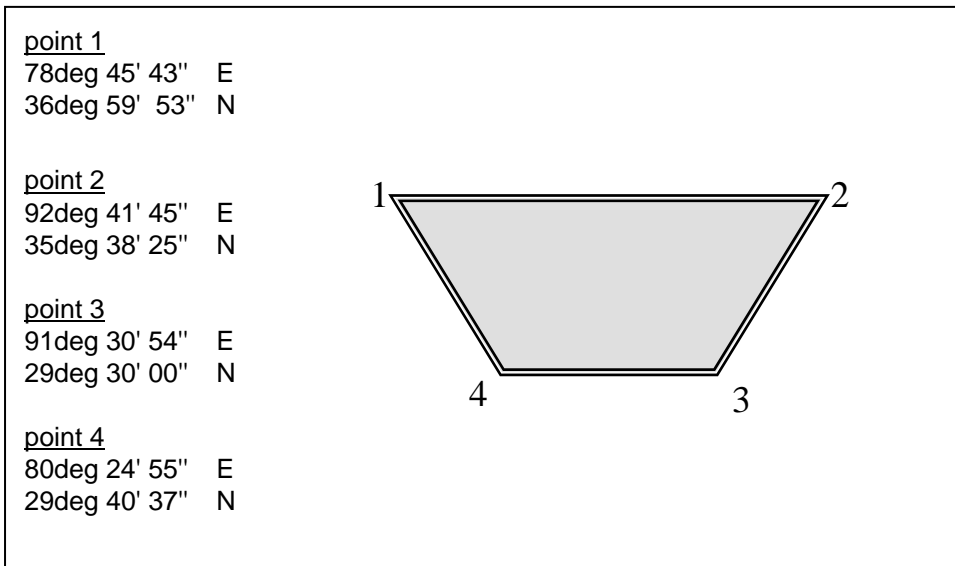
All ASAR level1 products.

3 LOW RATE BACKGROUND REGIONAL MISSION

The current Low Rte BRM definition is provided below:

| Mode | Where | Swath | Polarization |
|-------------------|---|-------|--|
| 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) Kara Sea (4) Baffin Bay (4) - Golf of Mexico & Caribbean Sea (5) VV: None. All GM acquisitions in HH |

No low rate BRM (GM in this case) has been planned between 3rd and 17th November 2004 over the area defined below to support RA-2 tests to be performed with no ASAR imaging operations.



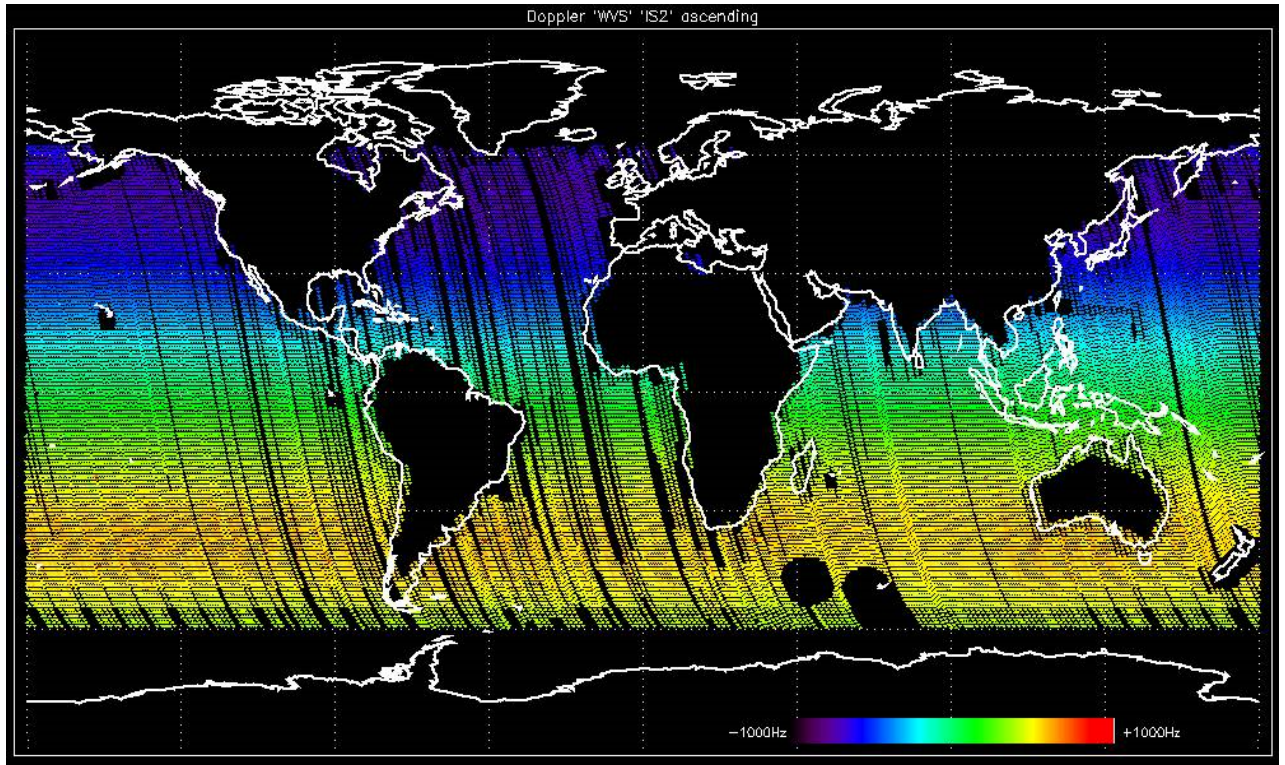
4 DOPPLER MONITORING

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.

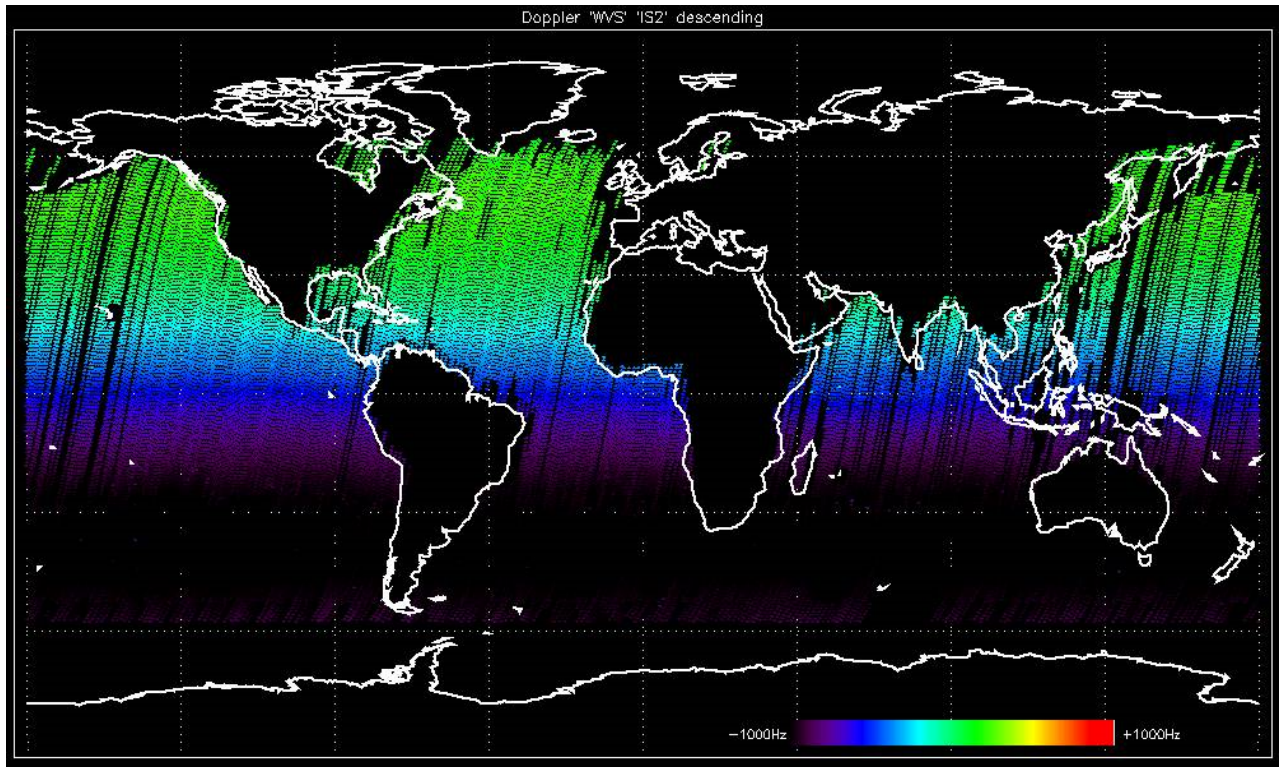
A Doppler discontinuity, previously observed daily at ~ 15:00 hours, has also been removed with the AOCS s/w upgrade.

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>.

4.1 *Absolute WV-IS2 Doppler Centroid evolution*



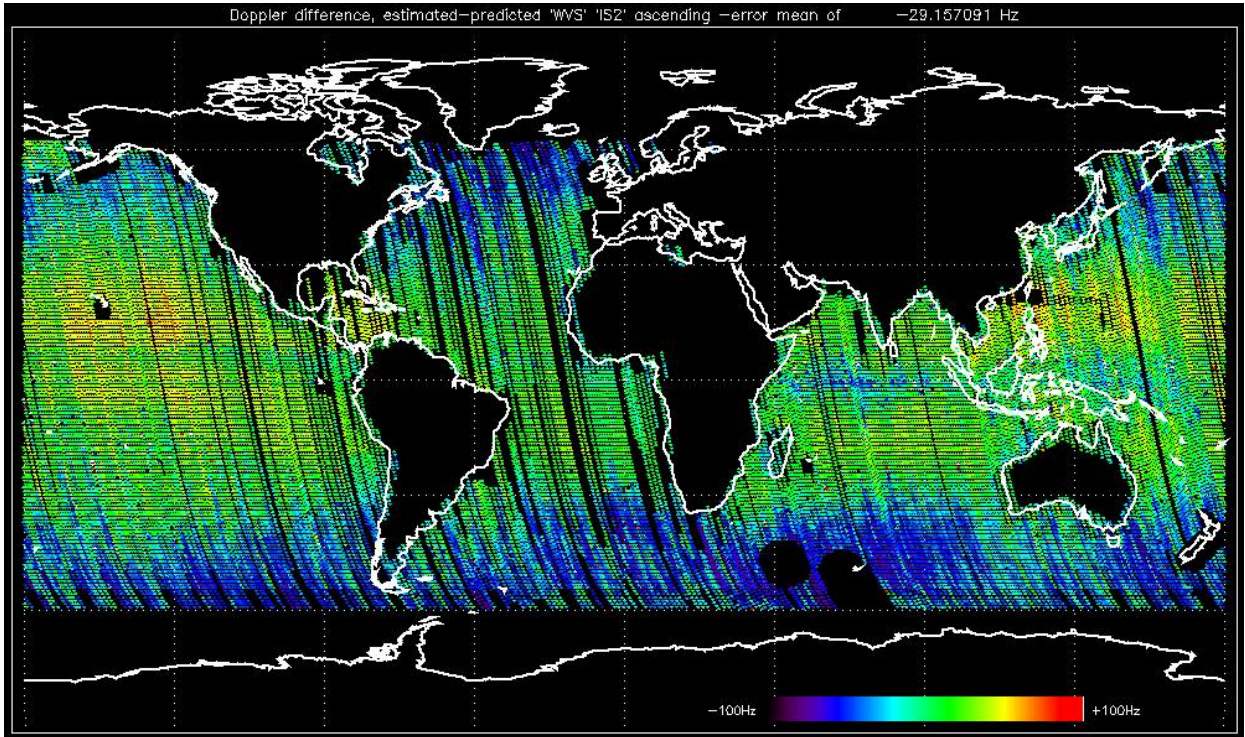
(a) absolute Doppler in ascending passes



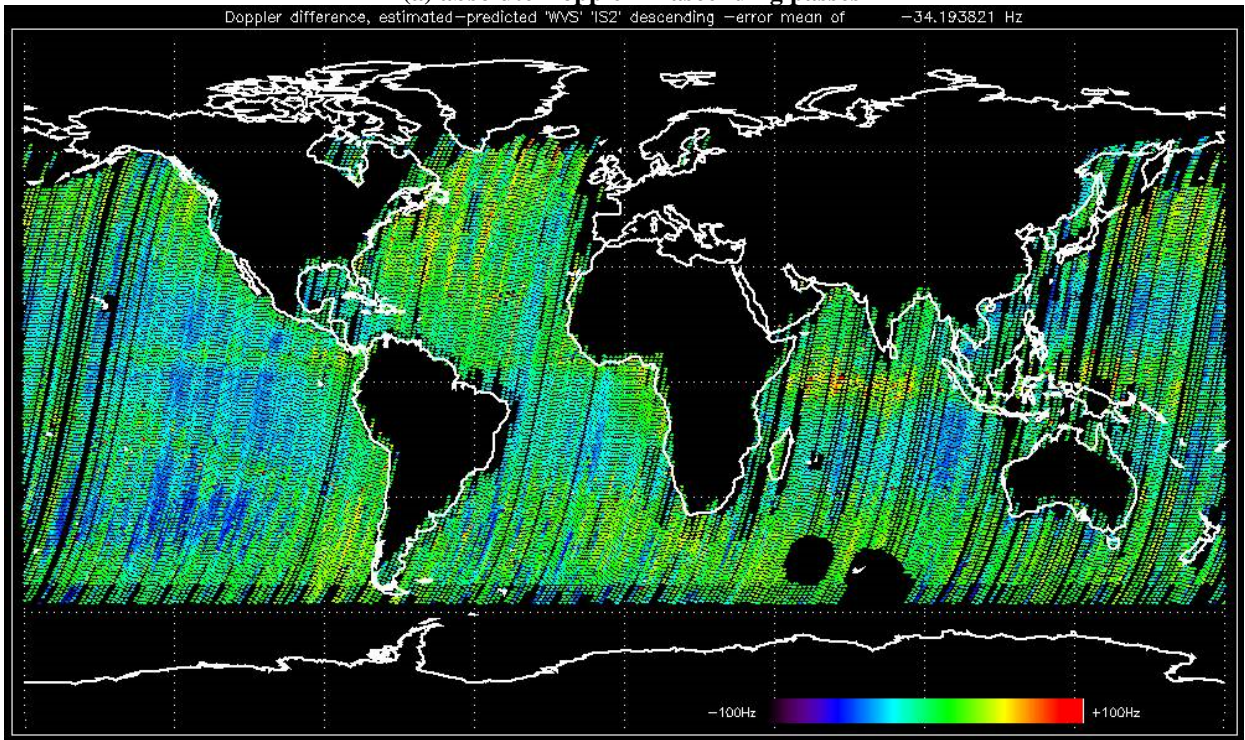
(b) absolute Doppler in descending passes

figure 1: Absolute Doppler evolution over the world

4.2 Residual WV-IS2 Doppler Centroid evolution



(a) absolute Doppler in ascending passes

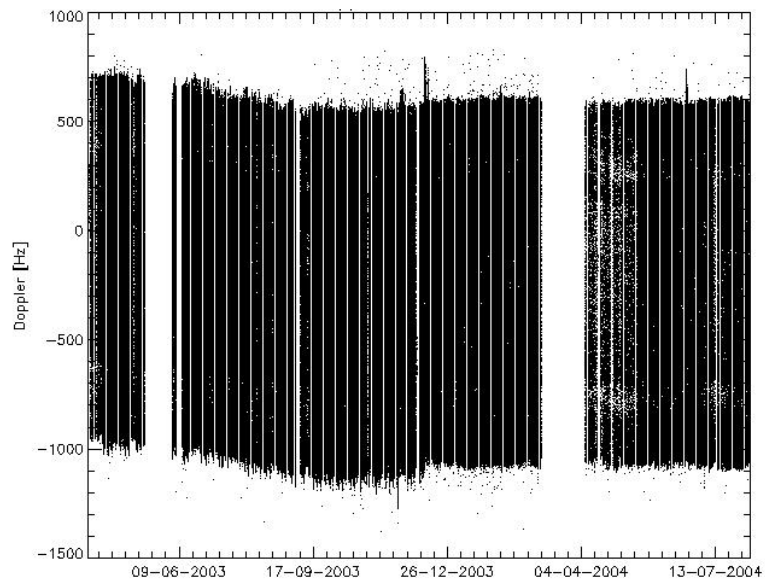


(b) absolute Doppler in descending passes

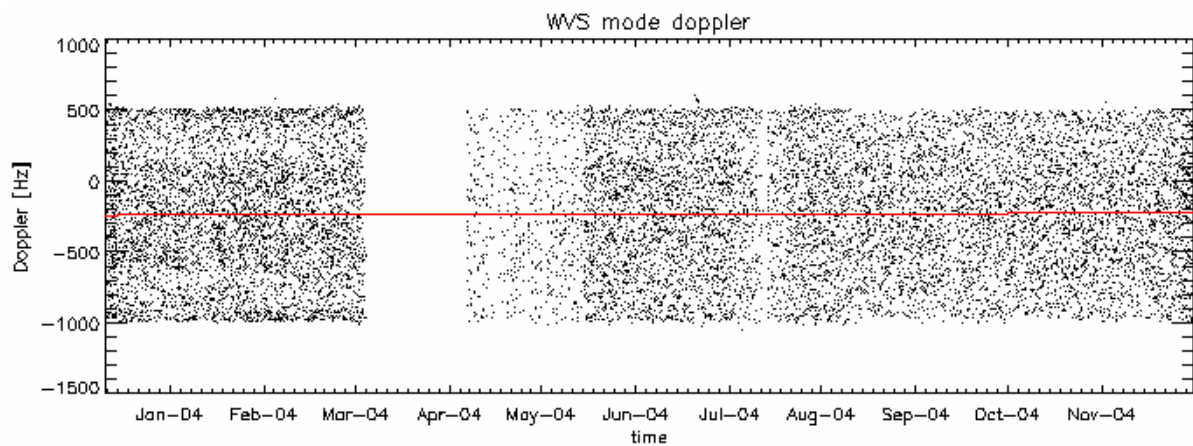
figure 2: Absolute Doppler evolution over the world

4.3 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

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-NOV-2004 till 01-DEC-2004. Theoretical Doppler is in red. Outliers correspond to data acquired during orbit manoeuvres.

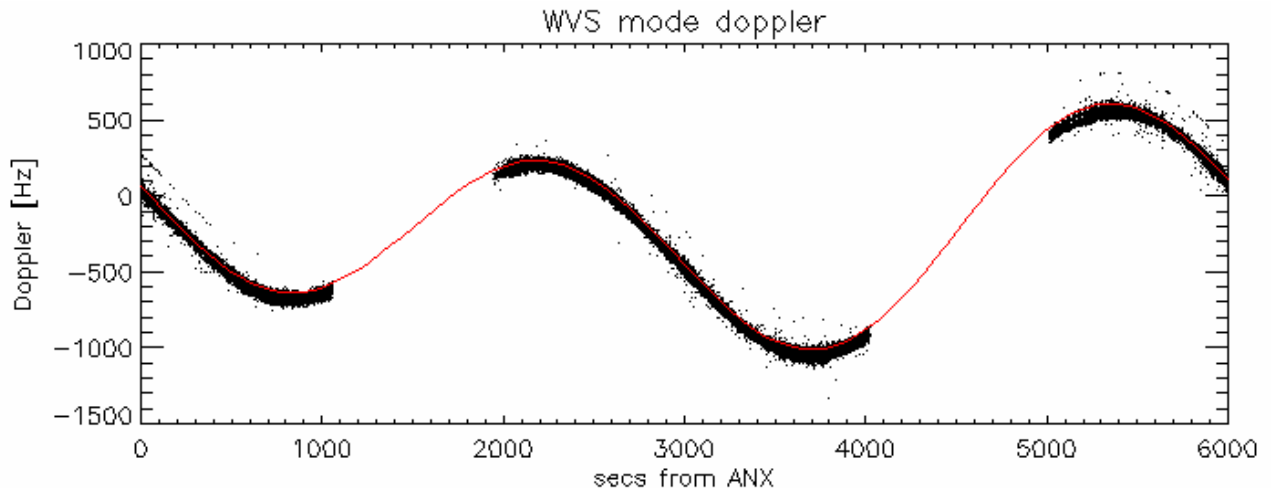


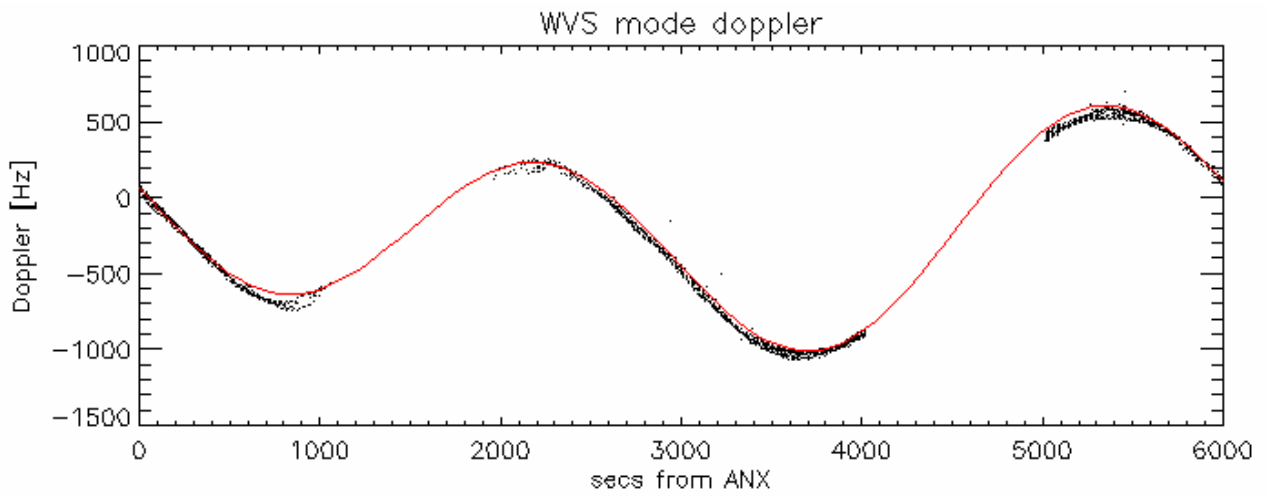
figure 4: Absolute Doppler evolution vs time from ANX

4.4 Residual Doppler Centroid evolution vs. time of the day

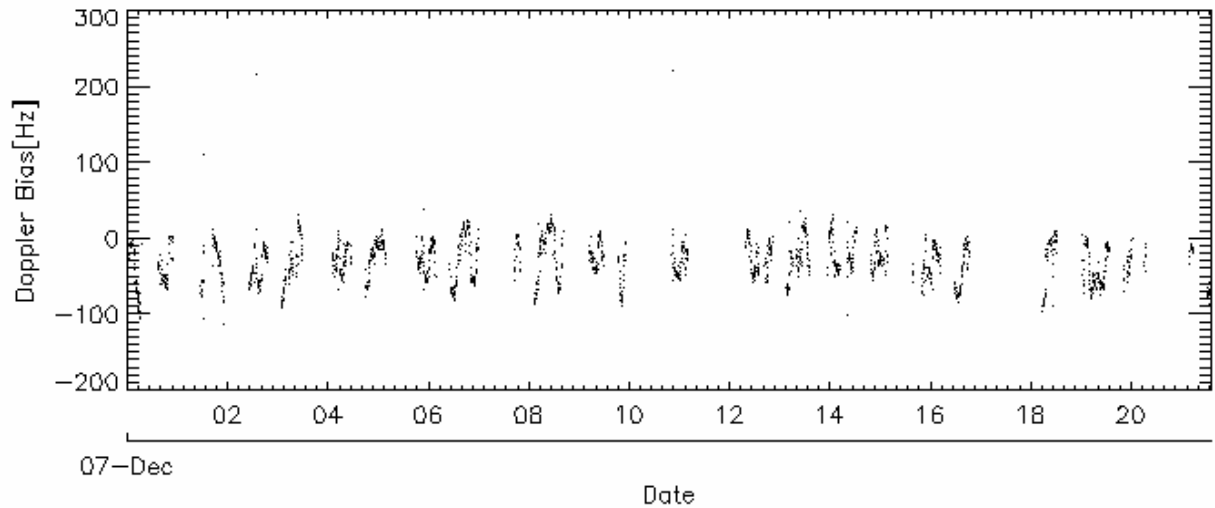
After the changes in the AOCS software on December 2003, the discontinuity in the ASAR Doppler Centroid frequency, previously observed every day at around 14:00 UTC, has been removed and the constant bias reduced is about 50 Hz.

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 in November 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.

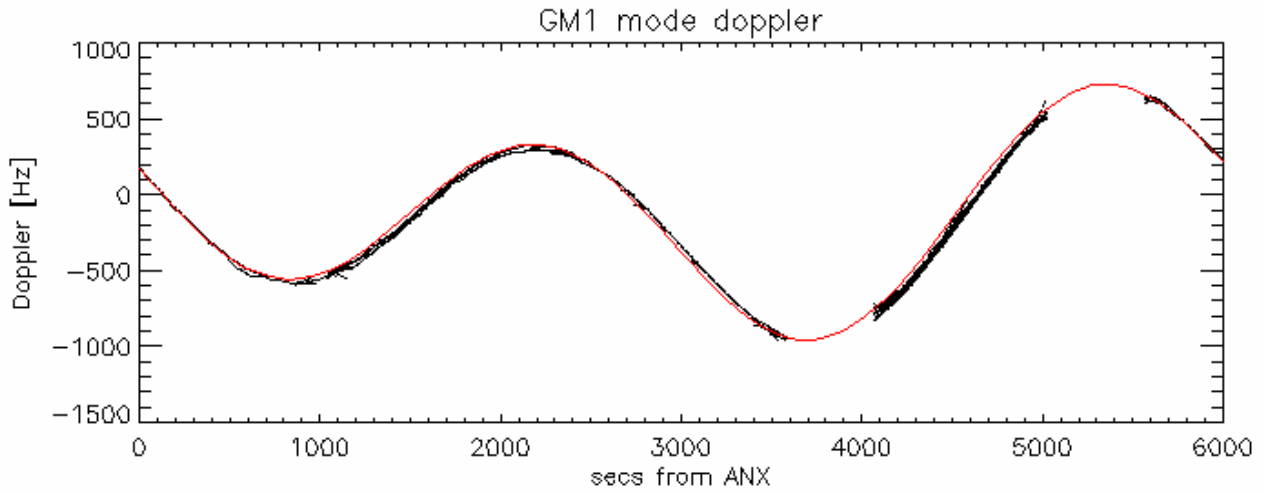


(a) Doppler evolution vs elapsed seconds since ANX

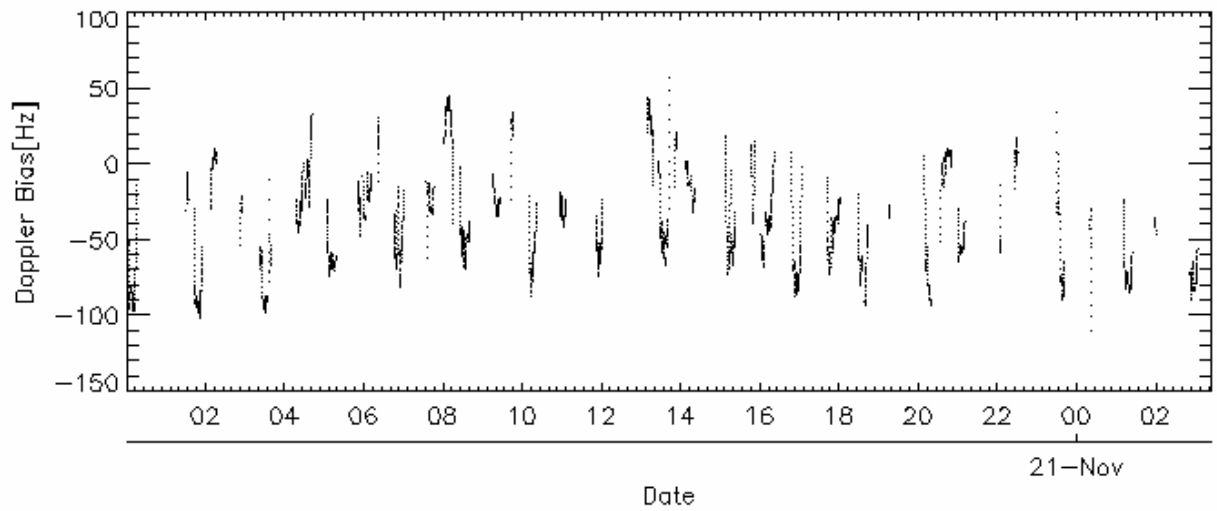


(b) residual Doppler evolution versus time of day

figure 5: Residual Doppler centroid evolution for WVS data



(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

5 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 polarizations. 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 | 0.84±1.02 | 1.04 | 0.18 | 1.02 | 0.60 | 1.31 | 1.01 | 0.97 |
| | ASAR | 0.23±0.41 | 0.22 | 0.03 | 0.10 | 0.31 | 0.15 | 0.59 | 0.40 |
| | Radarsat | 1.26±1.10 | 1.60 | 0.63 | 1.56 | 0.72 | 1.78 | 1.30 | 1.21 |
| IMG | All | 0.23±0.35 | | | | | | | |
| IMS | All | 0.56±1.00 | | | | | | | |
| IMM | All | 0.77±0.95 | | | | | | | |
| APP | All | 0.60±0.95 | 0.24 | 0.50 | 0.58 | 0.98 | 0.34 | 0.90 | 0.82 |
| | ASAR | -0.33±0.52 | 0.02 | -0.24 | 0.09 | -0.55 | -0.84 | -0.32 | -0.61 |
| | Radarsat | 0.73±0.93 | 0.27 | 0.70 | 0.62 | 1.28 | 0.46 | 1.12 | 0.96 |
| APG | All | -0.79±0.77 | | | | | | | |
| APS | All | 0.14±1.02 | | | | | | | |
| APM | All | 0.28±0.90 | | | | | | | |
| WSM | ASAR | -0.20±0.43 | | | | | | | |

ASAR Image Relative Radar Cross-Sections

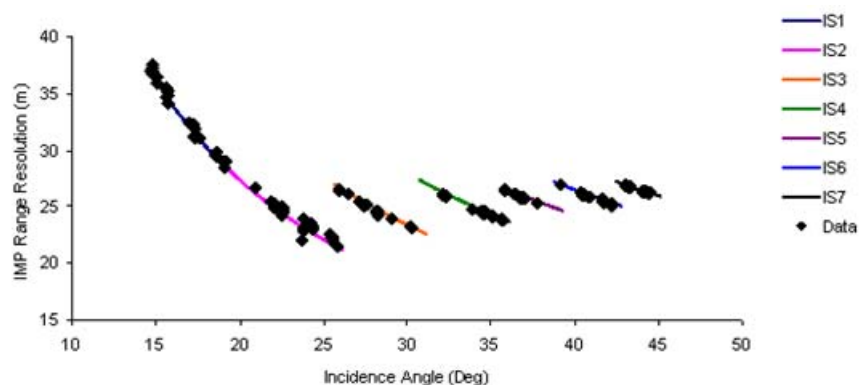
| Product type | Transponder | Relative RCS [dB] | | | |
|--------------|-------------|-------------------|------------|------------|------------|
| | | VV | HH | VH | HV |
| IMP | All | 1.16±0.91 | 0.29±0.96 | | |
| | ASAR | 0.37±0.39 | -0.03±0.31 | | |
| | Radarsat | 1.72±0.74 | 0.50±1.16 | | |
| APP | All | 0.96±0.67 | 0.09±1.05 | 0.58±0.82 | 0.86±1.08 |
| | ASAR | -0.38±0.58 | -0.14±0.48 | -0.56±0.49 | -0.32±0.60 |
| | Radarsat | 1.01±0.63 | 0.14±1.13 | 0.87±0.61 | 1.02±1.03 |

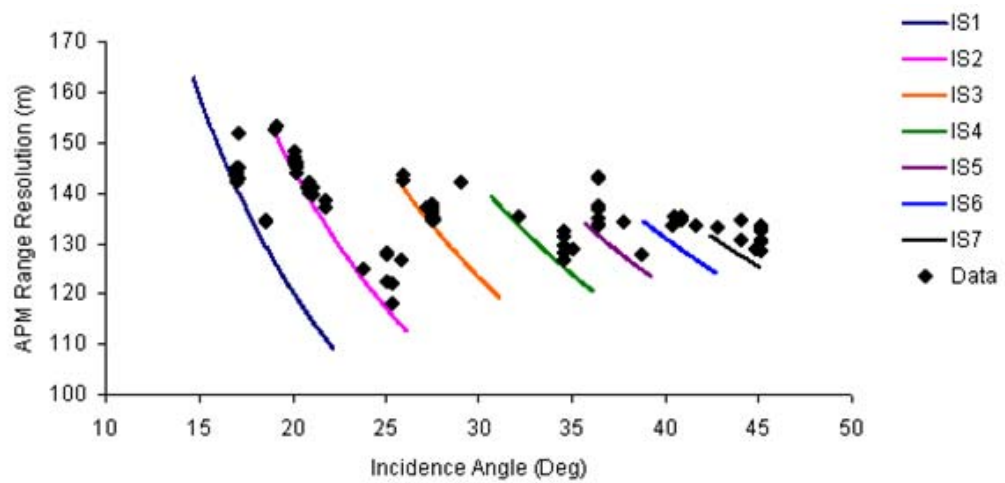
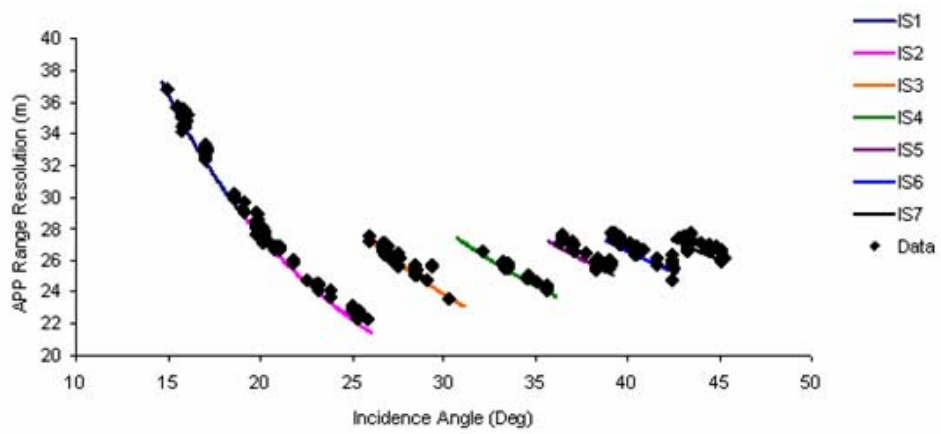
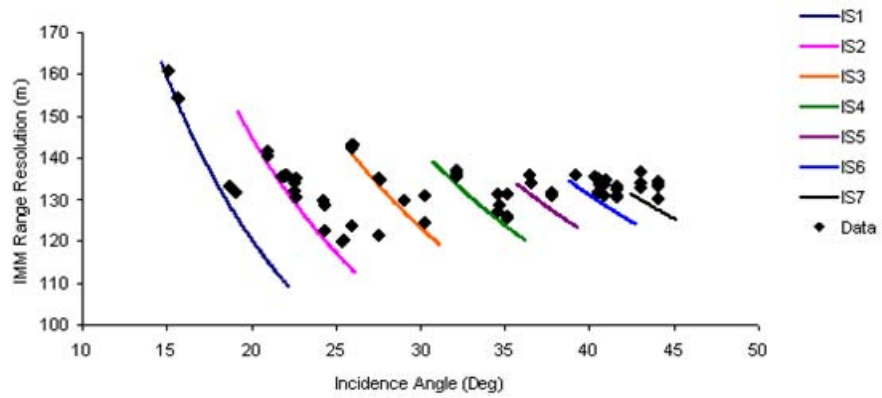
ASAR Image Relative Radar Cross-Sections

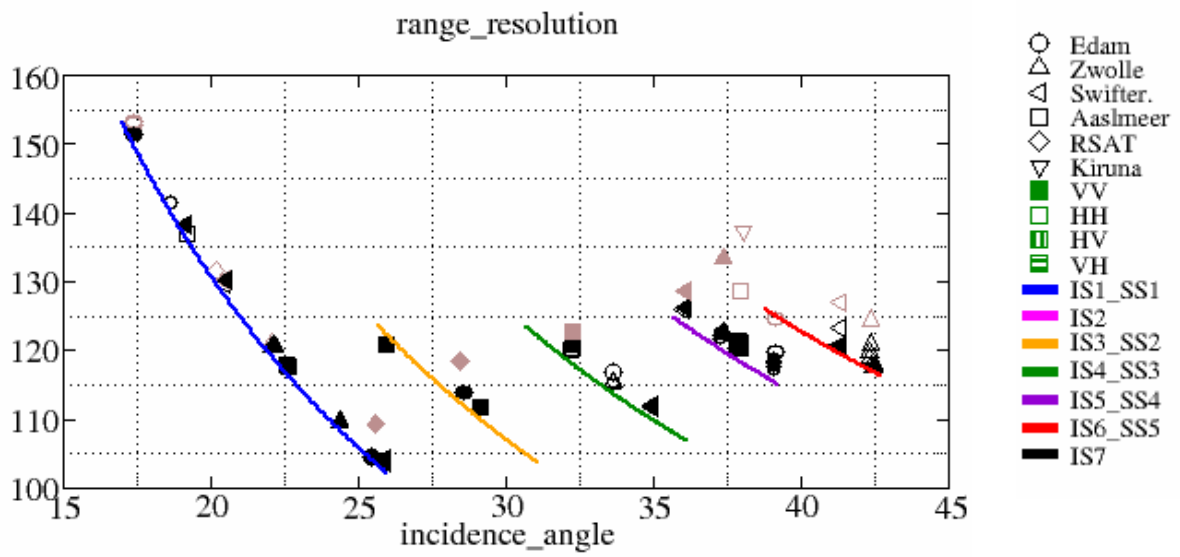
¹The relative RCS is defined as the difference between the nominal RCS and the measured RCS.

The tables below show IRF parameters measured per different product types. Please note that the performance for WSM products are given only for ASAR transponders reprocessed with pixel spacing of 40m.

| Product Type | Azimuth Res (m) | Range Res (m) | ISLR (dB) | PSLR (dB) | SSLR (dB) | No of Results |
|--------------|------------------------|----------------------------|-------------|-------------|-------------|---------------|
| IMP | 22.07±0.43 | Rg.dependent (fig. below) | -13.13±1.44 | -16.63±0.87 | -22.45±1.85 | 204 |
| IMG | 22.30±0.38 | 22.7 - 35.4 (rg.dependent) | -13.39±0.64 | -16.80±0.98 | -23.42±1.50 | 33 |
| IMS | 4.75±0.02 5.55±0.07 | 9.44±0.06 | -14.32±0.52 | -19.20±0.62 | -28.17±1.04 | 61 |
| IMM | 146.4±3.6 | Rg.dependent (fig. below) | -6.01±3.37 | -16.04±2.13 | -15.40±4.01 | 70 |
| APP | 27.68±0.79 | Rg.dependent (fig. below) | -12.21±1.64 | -19.00±0.86 | -25.53±2.78 | 427 |
| APG | 27.74±0.49 | 23.2 - 30.3 (rg.dependent) | -13.04±0.42 | -19.28±0.80 | -27.44±1.58 | 20 |
| APS | 5.00±1.73 | 8.39±0.10 | 2.92±2.41 | -2.50±1.32 | -17.60±4.27 | 79 |
| APM | 144.1±3.7 | Rg.dependent (fig. below) | -5.85±5.98 | -16.53±1.78 | -16.55±5.88 | 118 |
| GMI | 862.3±31.1 | 837.8-972.0 (rg.dependent) | -14.28±4.47 | -15.15±1.03 | -19.54±1.39 | 7 |
| WSM | 108.51±5.09 | 103.7-151.2 (rg.dependent) | -9.74±3.45 | -19.38±2.45 | -17.74±5.72 | 47 |







In the figure above, the symbol stands for a point target, the colour for the beam and the filling of the symbol stands for polarisation. Black symbols are the one with 40m pixel spacing while the brown are the 75m pixel spacing ones.

6 ELEVATION ANTENNA PATTERN MONITORING

6.1 *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 | 27/10/2004 |
| IS3_SS2 | VV | 27/08/2003 | | | 12/08/2004 | |
| IS3_SS2 | HV | | | | | |
| IS3_SS2 | VH | | | | | |
| IS4_SS3 | HH | | | | 12/08/2004 | |
| IS4_SS3 | VV | | | | | 27/10/2004 |
| IS4_SS3 | HV | | | 06/04/2004 | | |
| IS4_SS3 | VH | | | 06/04/2004 | | |
| IS5_SS4 | HH | 27/08/2003 | | 06/04/2004 | | 27/10/2004 |
| IS5_SS4 | VV | 27/08/2003 | | | | |
| IS5_SS4 | HV | | | 06/04/2004 | | |
| IS5_SS4 | VH | | | 06/04/2004 | | |
| IS6_SS5 | HH | | | | | 27/10/2004 |
| IS6_SS5 | VV | | | | | |
| IS6_SS5 | HV | | | 06/04/2004 | | |
| IS6_SS5 | VH | | | 06/04/2004 | | |
| IS7 | HH | | | | | |
| IS7 | VV | | | | | |
| IS7 | HV | | | | | |
| IS7 | VH | | | | | |

6.2 *History of elevation antenna pattern updates*

The table below summarizes 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_AX 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 & polarization | 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_000000 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_000000 is the same as in ASA_XCA_AXVIEC20020813_080042_20020413_000000_20021231_000000

| | | | | | |
|------------|----|----------|---|----------|----------|
| 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 |

| | | | | | |
|------------|------|----------|---|----------|----------|
| | 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 |
| | RF | 20041027 | ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000 | 20040412 | 20051231 |
| 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 |
| | RF | 20041027 | ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000 | 20040412 | 20051231 |

| | | | | | |
|------------|----|----------|---|----------|----------|
| 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 |
| 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 |
| | RF | 20041027 | ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000 | 20040412 | 20051231 |
| 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 |
| | 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 |
| | RF | 20041027 | ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000 | 20040412 | 20051231 |
| 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 |
| | 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 |

7 AUXILIARY FILES UPDATE

7.1 *Operational auxiliary data files*

The latest version of the ASAR auxiliary data files, currently used for the operational processing of ASAR data in the ENVISAT Ground Segment and which contain the most recent information on calibration and instrument parameters, are listed below:

Processor configuration file

[ASA_CON_AXVIEC20041027_165251_20021017_130000_20051231_000000](#)

ASAR External calibration data

[ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000](#)

[ASA_XCA_AXVIEC20041028_154000_20030804_000000_20040412_000000](#)

[ASA_XCA_AXVIEC20041027_163611_20030601_000000_20030804_000000](#)

[ASA_XCA_AXVIEC20041027_162907_20030211_000000_20030601_000000](#)

[ASA_XCA_AXVIEC20041129_173057_20020413_000000_20030211_000000](#)

Instrument auxiliary file

[ASA_INS_AXVIEC20040521_160843_20030211_000000_20041231_000000](#)

[ASA_INS_AXVIEC20031209_113259_20021030_110000_20030211_000000](#)

[ASA_INS_AXVIEC20031212_105841_20021017_162400_20021030_110000](#)

[ASA_INS_AXVIEC20031212_122530_20020815_131000_20021017_162400](#)

External characterization file

[ASA_XCH_AXVIEC20031209_112947_20020301_000000_20041231_000000](#)

These files as well as the previous versions of them can be downloaded from:

http://earth.esa.int/services/auxiliary_data/asar/

7.2 *Recent auxiliary file updates and description of changes*

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

[ASA_XCA_AXVIEC20041129_173057_20020413_000000_20030211_000000](#)

Absolute calibration constant values updated for data acquired during this period. Major changes affect AP IS5 and IS7 products. Other parameters are the same as previous XCA file covering this time period (file created on 20030801).

[ASA_XCA_AXVIEC20041028_154000_20030804_000000_20040412_000000](#)

The SS2-VV elevation antenna pattern used for data acquired after 12 April 2004 is also applied now to data acquired after 4 August 2004.

ASA_CON_AXVIEC20041027_165251_20021017_130000_20051231_000000

File consistent with updated format in PF-ASAR v4.0 (additional parameters in spare fields included and parameters for the new WSS product included).

Normalization for WSM products changed to Reference Energy.

Updated reference energy values for WSM products (values in dB):

HH (from SS1 to SS5): 1.08, 6.96, 7.5, 7.95, 9.13

VV (from SS1 to SS5): 1.11, 6.9, 7.5, 7.95, 9.1

ASA_XCA_AXVIEC20041027_164238_20040412_000000_20051231_000000

Updated K for WV IS2 VV to follow an observed drift. The new K is valid since 12 April 2004.

New K WV IS2 VV: 50222.9

Updated elevation antenna patterns for: SS2 HH, SS4 HH, SS5 HH. They are valid since 12 April 2004.

Updated elevation antenna pattern for SS3 VV. Valid since 4 Aug 2003 (this is the same pattern as in file valid from 4-Aug-04 to 12-Apr-04).

ASA_XCA_AXVIEC20041028_154000_20030804_000000_20040412_000000

New K for WV IS2 VV after the DSS change in May 2003. Due to the drift observed in the WV K after May2003, the new value is valid since 1 June 2003 till 12 April 2004.

New K for WV IS2 VV for this period: 51571.6

Updated elevation antenna pattern for SS3 VV. Valid since 4 Aug 2003.

ASA_XCA_AXVIEC20041027_163611_20030601_000000_20030804_000000

New K for WV IS2 after the DSS change in May 2003. Due to the drift observed in the WV K after May2003, the new value is since 1 June 2003 till 12 April 2004.

New K for WV IS2 VV for this period: 51571.6

ASA_XCA_AXVIEC20041027_162907_20030211_000000_20030601_000000

Created to use a different K for WV (IS2 VV) before and after May 2003. No changes with respect to the previous XCA file covering this time period.

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 polarization). Changed AP normalization 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 polarization). Changed AP normalization 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