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ENVISAT

CYCLIC ALTIMETRIC REPORT

CYCLE 18

Quality Assessment Report

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1 INTRODUCTION

This documents aims at reporting on the performances of the EnviSat Radar Altimeter, Microwave Radiometer and DORIS sensors, on the data quality of the corresponding Fast Delivery products as well as on the main events occurred during cycle 18.

This reports covers the period from the 7th of July to the 11th of August 2003.

2 DISTRIBUTION LIST

This report is available in PDF format at the internet address http://earth.esa.int/pcs/envisat

3 ACRONYMS

AGC	Automatic Gain Control
DORIS	Doppler Orbitography and Radiopositioning Integrated by Satellite
DSR	Data Set Record
ERS	European Remote Sensing satellite
ESRIN	European Space Research Institute
ESOC	European Space Operations Centre
FD	Fast Delivery products
GS	Ground Segment
GTS	Global Telecommunication System
HTL	Height Tracking Loop
ICU	Instrument Control Unit
IECF	Instrument Engineering Calibration Facility
IF	Intermediate Frequency
IPF	Instrument Processing Facility
LUT	Look Up Table
MCMD	MacroCommand
MPH	Main Product Header
MSS	Mean Sea Surface
MWR	MicroWave Radiometer
MPS	Mission Planning System
PCS	ERS Products Control Service
PCF	EnviSat Product Control Facility
PDHS-E	ESRIN Processing and Data Handling Station
PDHS-K	Kiruna Processing and Data Handling Station
PMC	Payload Main Computer
PTR	Point Target Response
RA-2	EnviSat Radar Altimeter bi-frequency
RSL	Resolution Selection Logic
SEU	Single Event

SFCM	Stellar Fine Control Mode
SPH	Specific Product header
SPSA	Signal Processing Sub-Assembly
S/W	Software
TM	Telemetry
TRP	Transponder

4 REFERENCE DOCUMENTS

[R – 1] F-PAC MONTHLY REPORT, SALP-RP-M-OP-15015-CN, July 2003
[R – 2] ENVISAT Microwave Radiometer Assessment Report, , http://earth.esa.int/pcs/envisat
[R – 3] Envisat RA-2 IF Mask weird behavior: Investigation Report
[R – 4] Instrument Performance Evaluation and Analysis Summary, PO-TR-ALS-RA-0042
[R – 5] Instrument Corrections Applied on RA-2 Level 1b products, Paper presented at the ENVISAT Calibration Review in September 2002
[R – 6] ENVISAT Phase E Cal/Val Acquisition Plan, ENVI-SPPA-EOPG-TN-03-0008
[R – 7] RA-2 S-Band Anomaly Investigation, PO-TN-ESA-RA-1331
[R – 8] RA-2 Performance Results, Paper presented at the ENVISAT Calibration Review in September 2002
[R – 9] ECMWF Report on ENVISAT RA- 2 for July 2003, Report on ENVISAT Radar Altimeter - 2 (RA- 2), Wind/ Wave Product with Height Information (RA2_ WWV_ 2P), http://earth.esa.int/pcs/envisat
[R – 10] Envisat GDR Quality Assessment Report, SALP-RP-P2-EX-21121-CLS012

5 GENERAL QUALITY ASSESSMENT

5.1 Instruments status

The RA-2 instrument has been working nominally for the whole cycle apart from the two instrument anomalies as given in par. 6.1 for which the instrument was unavailable for less than 4 hours.

The two known causes of random on-board anomalies are still present. In particular we refer to the so-called S-Band anomaly and the IF mask weird behavior described respectively in [R – 7] and [R – 3]. Only the S-Band anomaly partially affects a low number of Envisat data products as given in par. 7.1.7.

MWR sensor assessment report: refer to [R – 2].

DORIS sensor assessment report: refer to [R – 1].

5.2 Cycle quality

The summary of the RA-2 data products availability for this cycle is given in Table 1.

week	Start Orbit	Stop Orbit	Tot unavailability (s)	L0 unavailability (s)	L1b unavailability (s)	Sensor availability percentage	L0 availability percentage	L1b availability percentage
1	7069	7169.2	67.636	6412.686	86508.58	99.98882	98.92852	85.52903
2	7169.2	7269.4	76.637	10627.13	81817.37	99.98733	98.2302	86.29162
3	7269.4	7369.6	7107.124	1211.608	92977.77	98.82488	98.62455	83.31398
4	7369.6	7469.8	7000.126	53965.46	119702.2	98.84257	89.91972	78.91085
5	7469.8	7570	76.637	9100.219	71995.3	99.98733	98.48266	87.9144

Table 1: RA-2 L0 and L1b Data products availability summary for cycle 18

5.3 Orbit quality

The orbit was maintained within the +/- 1km ground track. A two burn SFCM was executed on 11-July-2003 for attitude control.

5.4 Ground Segment Processing Chain Status

5.4.1 IPF PROCESSING CHAIN

IPF S/W version: The current IPF processing chain is version 4.54.

IPF anomalies: One anomaly has been spotted during this cycle:

1. ADF data set control configuration problem at ESRIN PDHS-E
   A RA2_CON_AX auxiliary file has been wrongly used in the period from the 12th of May to 25th of July 2003. As a result, non-nominal minimum and maximum threshold values on AGC have been used. This caused the presence of fields set to default values in many DSRs located in particular in the Artic region.

A further upgrade of the RA-2_CON auxiliary file is foreseen for beginning of September 2003.

5.4.2 F-PAC PROCESSING CHAIN

F-PAC SW version: The current F-PAC processing chain is version 6.1 since August 1st, 2003.
F-PAC anomalies: anomalies are detailed in the F-PAC Monthly Report [R - 1].

5.4.3 AUXILIARY DATA FILE

Hereafter all the Auxiliary files used actually used by the IPF ground processing are listed
RA2_CHD_AXVIEC20030402_094243_20030407_000000_20200101_000000

RA2_CON_AXVIEC20020606_164228_20020101_000000_20200101_000000
RA2_CST_AXVIEC20020621_135858_20020101_000000_20200101_000000
RA2_DIP_AXVIEC20020122_134206_20020101_000000_20200101_000000
RA2_GEO_AXVIEC20020314_093428_20020101_000000_20200101_000000
RA2_ICT_AXVIEC20020709_131546_20020101_000000_20200101_000000
RA2_IFA_AXVIEC20020313_174755_20020101_000000_20200101_000000
RA2_IFB_AXVIEC20020313_174959_20020101_000000_20200101_000000
RA2_IFF_AXVIEC20021023_085202_20020101_000000_20100101_000000
RA2_IOC_AXVIEC20020122_141121_20020101_000000_20200101_000000
RA2_MET_AXVIEC20020204_073357_20020101_000000_20200101_000000
RA2_MSS_AXVIEC20021023_141823_20020101_000000_20200101_000000
RA2_OT1_AXVIEC20020313_173134_20020101_000000_20200101_000000
RA2_OT2_AXVIEC20020313_173944_20020101_000000_20200101_000000
RA2_SET_AXVIEC20020122_150917_20020101_000000_20200101_000000
RA2_SL1_AXVIEC20030131_100228_20020101_000000_20200101_000000
RA2_SL2_AXVIEC20030131_101757_20020101_000000_20200101_000000
RA2_SOI_AXVIEC20021023_140434_20020621_000000_20200101_000000
RA2_SSB_AXVIEC20020122_160151_20020101_000000_20200101_000000
RA2_TLD_AXVIEC20020313_175443_20020101_000000_20200101_000000
RA2_USO_AXVIEC20020122_162920_20020101_000000_20200101_000000

No change has been performed during cycle 18, the most recent change has been performed to the RA-2 Characterization file during cycle 15 and uploaded in the processing chain on April the 7th together with IPF version 4.54. This introduces a bias of 3.5 dBs on the Ku Backscattering coefficient in order to be compatible with the “Witter and Chelton” wind model.

The RA2_POL_AX, the RA2_SOL_AX and the RA2_PLA_AX have been regularly updated every week without problems.

5.4.4 PLANNED UPGRADES

An upgrade of the IPF Level 1B and Level 2 processing chains and of the Level 2 F-PAC processing chains is currently planned.
This will contain the following:

1. Change in the AGC evaluation for S-band in the L1b processor.
2. Neural Network algorithm for evaluation of Wet Tropospheric Correction, Water Vapor and Liquid Water Content in the L2 processing.
3. Refinement in L2 Ice2 Retracker Algorithm.
4. ADF updates:
    a. Level 1 ADF: New IF mask ADF
    b. Level 2 ADF: Rain Flag, SSB, CLS01 MSS, Tides GOT002 and FES02, as recommended by the RA-2 and MWR CCVT.

The changes related to the L2 processor have already been implemented in the F-PAC chain as reported in [R – 1].

6 ENVISAT PAYLOAD STATUS

6.1 Altimeter Events

The Radar Altimeter 2, during cycle 18, was unavailable twice, in the following time periods:
Start: 26 Jul 2003 15:28:11 Orbit = 07337 RA-2 to Stand-by/Refuse due to
Stop: 26 Jul 2003 17:25:35 Orbit = 07338 Individual Echoes MCMD Time out

Start: 31 Jul 2003 16:11:02 Orbit = 07409 RA-2 to Stand-by/Refuse due to
Stop: 31 Jul 2003 18:06:30 Orbit = 07410 Individual Echoes MCMD Time out.

6.1.1 RA-2 INSTRUMENT PLANNING

The RA-2 instrument planning was performed as follows:

- IF Calibration Mode according the nominal operational acquisition scheme: 100 seconds of data per day over Himalayan region.
- Preset Loop Output mode for Austrian Range transponders.
- Preset Loop output acquisition over the transponder in support to CRYOSAT project, only descending pass.
- Preset Loop output acquisitions over ESA transponder, to be located in the Rome area.
- Individual Echoes background planning: buffering of 20 Data block of individual Echoes and transmission of the in the following 160 Data Blocks. This repeated continuously.
- Individual Echoes planning in correspondence with IF Calibration Mode: buffering of one Data Block of Individual Echoes and transmission of it during the following 8 Data blocks. This has been repeated for 12 times.

During cycle 18, an anomaly in the Mission Planning System (MPS), affecting the creation of the RA-2 MCMD related to the acquisition of the RA-2 Individual Echoes was spotted. The anomaly was resulting in the limitation of only one or two repetitions of Individual Echoes transmitted every single orbit.
This has been solved at the beginning of August 2003 to match with the nominal background planning mission. This will be effective from cycle 19.

6.2 MWR Events

The MWR was never unavailable, during cycle 18.

6.3 DORIS Events

The DORIS instrument was never unavailable, during cycle 18.

7 INSTRUMENT PERFORMANCES

7.1 RA-2 Calibration performances

7.1.1 IF FILTER SHAPE

During cycle 18 the IF Calibration Mode still shows the weird behavior described in [R – 3]. This problem, present since the beginning of the mission, is still under investigation. The anomaly directly affects the number of valid RA-2 IF masks obtained per cycle, but does not refrain from the generation of the IF mask correction file, used in input to the Level 1 B ground processing.

In Figure 1 all IF masks retrieved by averaging the 100 seconds of data acquired daily during cycle 18 are plotted in the left panel. The on-ground measured IF mask (ref [R – 4]) is also plotted in that panel with a red solid line. In the right panel the difference of each of the calculated IF masks with respect to the on-ground measured one is reported. Two clear classes of RA-2 IF masks appear, the nominal IF masks very similar to the reference one, and the 'weird' non-nominal ones. These latter are edited during the Level 1B ground processing IF mask generation.

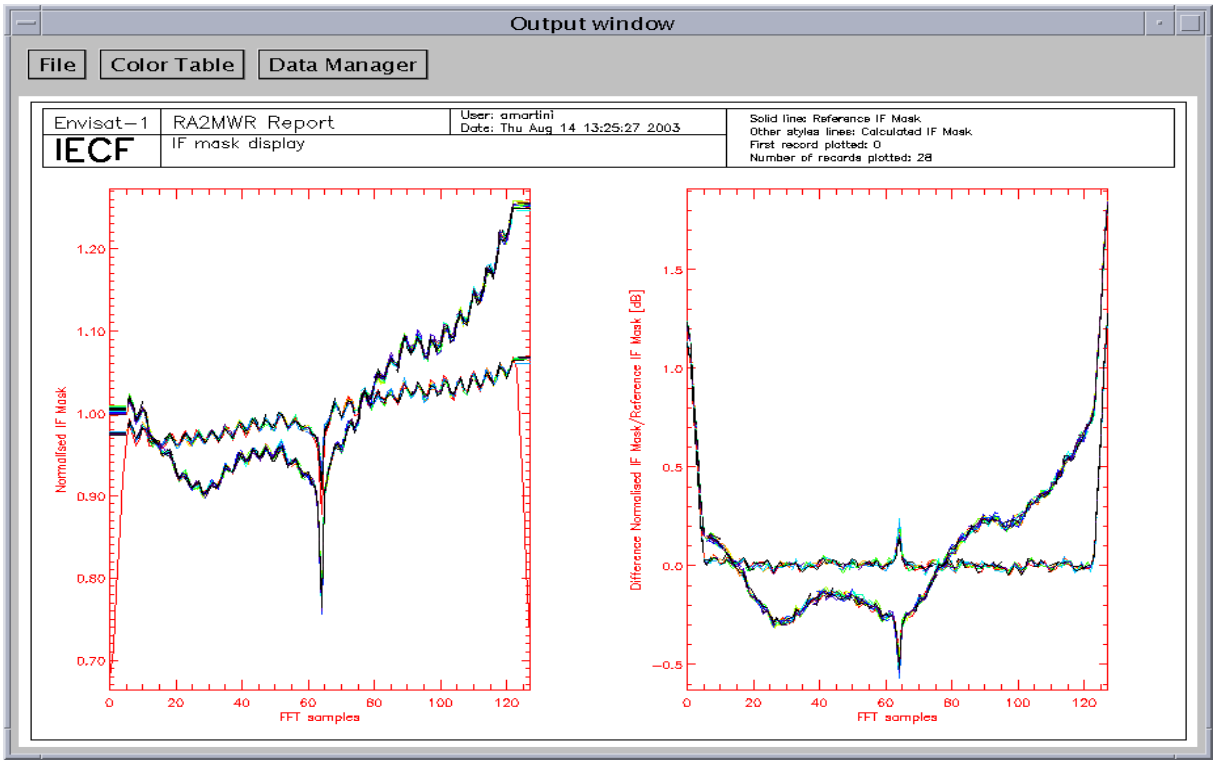


Figure 1: IF masks retrieved daily during cycle 18 plotted together with the on-ground reference.

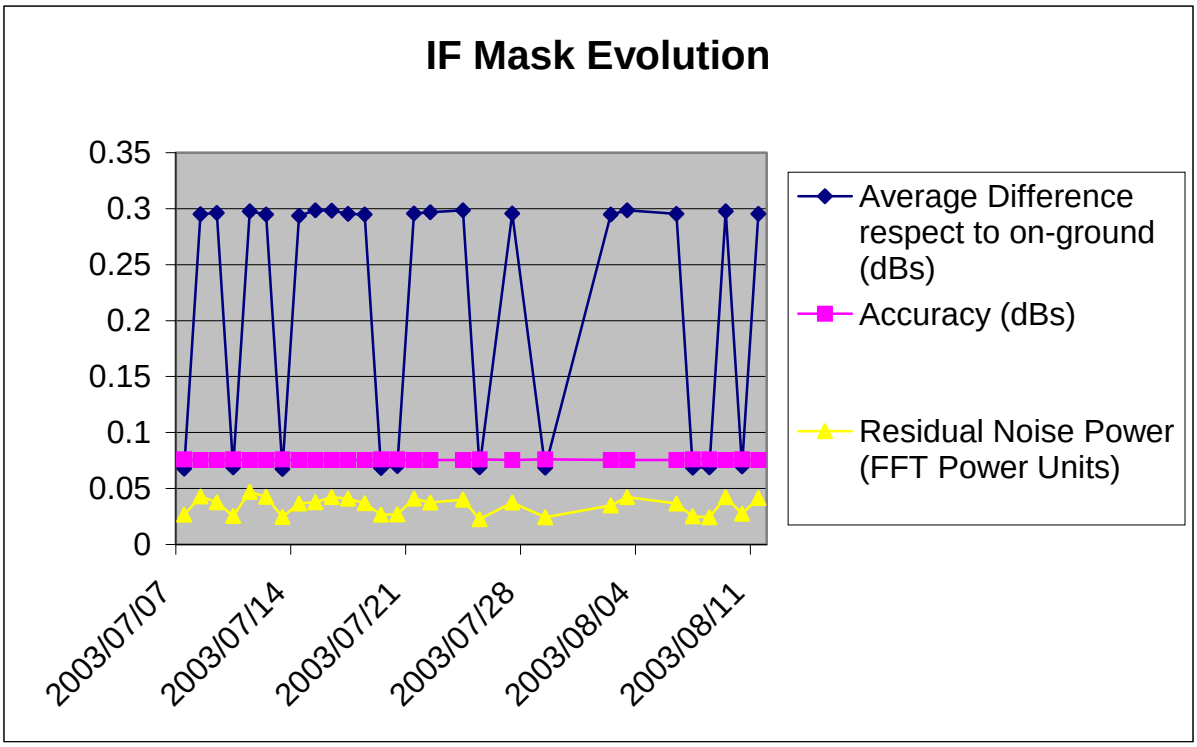


Figure 2: Evolution of the IF mask related parameters for IF masks retrieved daily during cycle 18

In Figure 2 the evolution of the IF mask quality parameters evaluated as in [R – 4] is reported. It can be observed that the difference with respect to the on-ground reference varies between about 0.07 dBs for good IF masks and about 0.3 dBs for weird IF masks. Also the residual noise is higher for weird masks while the accuracy remains constant over the whole cycle. The variability of the Average Difference and the Residual Noise does not seem to follow any kind of pattern.

7.1.2 USO

In Figure 3 the USO clock period trend retrieved during cycle 18 is reported. In order to make the variability visible, the difference of the actual USO clock period with respect to the nominal one has been plotted, in the upper panel. In the lower panel the Range error due to the USO clock variability has been reported taking a satellite altitude of 800 Km as a nominal value.

The difference in USO clock period with respect to the nominal one is of the order of 5*10^-4 picoseconds; a small trend can be detected for this cycle with an impact on the RA-2 Range measurement of about 0.5 millimeters.

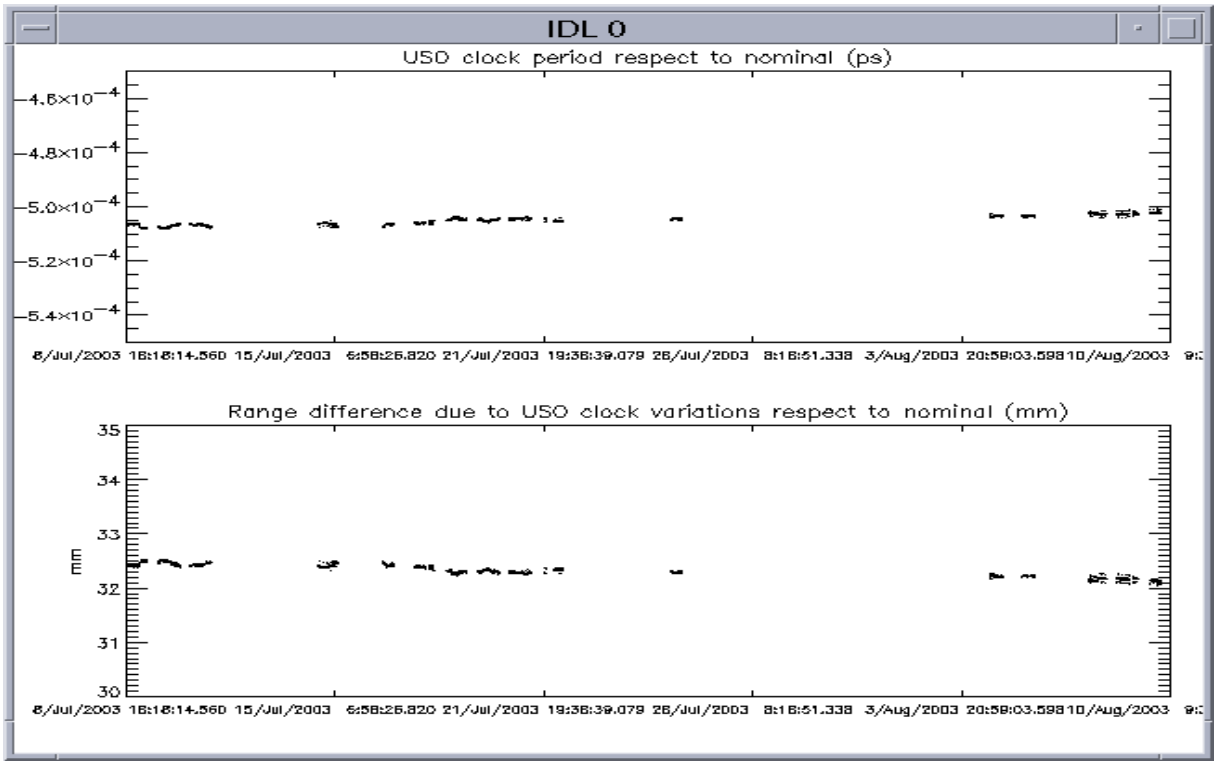


Figure 3: USO clock period trend for cycle 18

7.1.3 TRACKING CAPABILITY

In Figure 4 and Figure 5, the Chirp ID is plotted respectively for ascending and descending passes of cycle 18. The MDSRs acquired with 320MHz bandwidth are plotted in light gray (Chirp ID equal to 0), the ones acquired with 80MHz bandwidth are plotted in violet (Chirp ID equal to 1) and the ones acquired with the 20MH bandwidth are plotted in dark green (Chirp ID equal to 2).

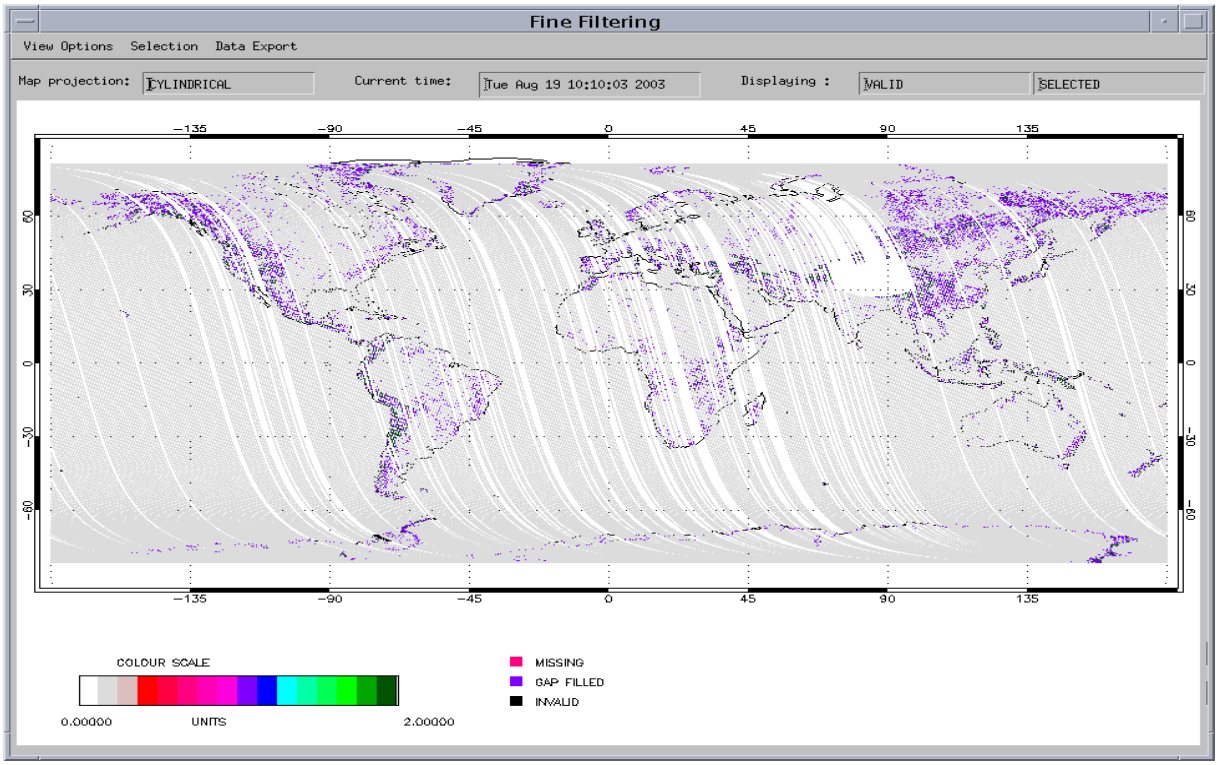


Figure 4: RA-2 Chirp ID for ascending passes during cycle 18

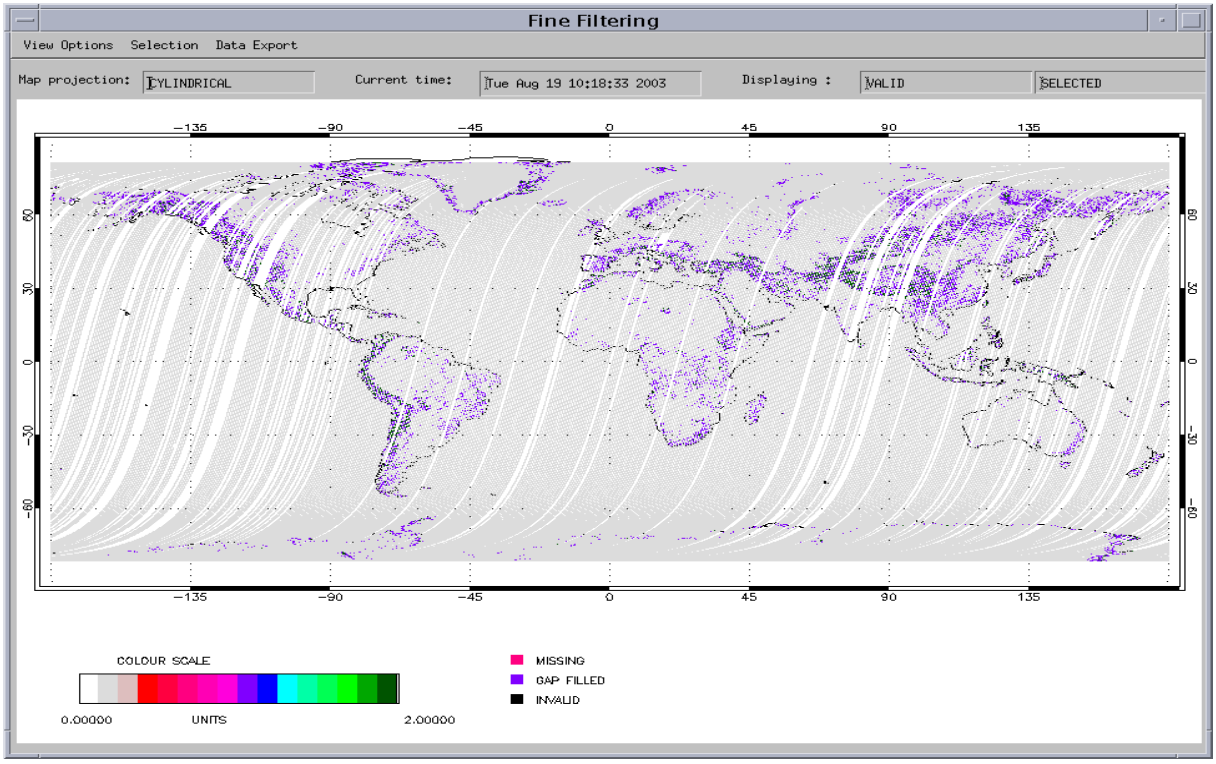


Figure 5: RA-2 Chirp ID for descending passes during cycle 18

The corresponding percentages of acquisition in the different resolutions subdivided by surface type are given in Table 2:

Surface type	320 MHz	80 MHz	20MHz
Open Ocean	99.992%	0.007%	0.001%
Costal Water (ocean depth < 200 m)	98.36%	1.44%	0.20%
Sea Ice	99.19%	0.74%	0.07%
Ice Sheet	96.39%	3.01%	0.60%
Land	81.58%	14.50%	3.92%
All world	95.25%	3.77%	0.98%

Table 2: RA-2 Tracking capability: Chirp ID percentages discriminated by surface type

The figures given for the RA-2 tracking performances during this cycle are very much in line with the ones recorded at the end of the Commissioning Phase and presented in [R – 8]. The slight differences are in part due to the different algorithms used to discriminate the surface types.

Those figures satisfy completely the objectives of the Commissioning Phase RSL and Tracking optimization hereafter reported:
320MHz over Ocean > 99%
320 MHz within 15km of Land/Ocean boundary (Costal Water)
320 MHz over Sea Ice > 95%
320/80 MHz Fixed resolution at Ice Sheet Crossovers > 95%
320MHz over Ice Shelves > 95%

7.1.4 SIGMA0 TRANSPONDER

No data relative to the Sigma_0 Transponder calibration is available for cycle 18. Some work has been performed to identify the temporary sites and to plan the acquisitions for future cycles.

7.1.5 DATATION

No value is available for the datation bias relative to cycle 18 since the GDR data needed for this aim are not yet available.

7.1.6 MISPOINTING

In Figure 6 the trend and the histogram of the mispointing squared (smoothed over 120 s) is reported in deg^2*10e-4
The average value is of about 0.028 deg^2 which is not in agreement with the figures reported at platform level.
However this is known to be due to a not perfect tuning of the algorithm used to retrieve the mispointing value from the RA-2 waveform data. Work is on-going in order to refine the L2 mispointing retrieval algorithm.

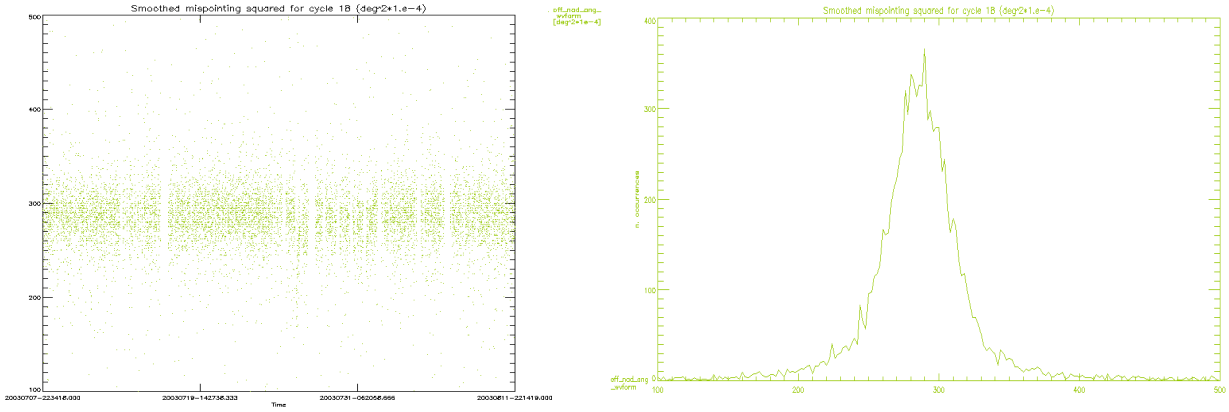


Figure 6: Smoothed mispointing squared trend and histogram for cycle 18 (deg^2*10^4)

7.1.7 S-BAND ANOMALY

The so-called "S-Band anomaly" still affects the performances of RA-2. Hereafter a list is reported of the products files that have been affected by this problem during cycle 18. Being the method used a statistical one working on ocean data; files containing less than 1000 seconds of data over ocean have not been considered. This choice is supported by the fact that the "S-Band anomaly" is associated to a particular instrumental behavior that cannot appear and disappear within a short time frame.

File name	Start date	Start time	Stop date	Stop time
RA2_FGD_2PNPDK20030713_055216_000062432018_00077_07145_0233.N1	13-Jul-03	05:52:16.167331	13-Jul-03	07:36:18.967375
RA2_FGD_2PNPDK20030713_073537_000060172018_00078_07146_0234.N1	13-Jul-03	07:35:37.805074	13-Jul-03	09:15:54.463131
RA2_FGD_2PNPDK20030713_091512_000060222018_00079_07147_0235.N1	13-Jul-03	09:15:12.186834	13-Jul-03	10:55:34.414889
RA2_FGD_2PNPDK20030713_105452_000060042018_00080_07148_0236.N1	13-Jul-03	10:54:52.138593	13-Jul-03	12:34:56.542649
RA2_FGD_2PNPDK20030713_123424_000059322018_00081_07149_0237.N1	13-Jul-03	12:34:24.292350	13-Jul-03	14:13:16.286412
RA2_FGD_2PNPDK20030713_141244_000050262018_00082_07150_0238.N1	13-Jul-03	14:12:44.036111	13-Jul-03	15:36:30.348165
RA2_FGD_2PNPDE20030717_234905_000061212018_00145_07213_0128.N1	17-Jul-03	23:49:05.374423	18-Jul-03	01:31:06.748476
RA2_FGD_2PNPDE20030718_013035_000061692018_00146_07214_0130.N1	18-Jul-03	01:30:35.612176	18-Jul-03	03:13:24.888226
RA2_FGD_2PNPDE20030718_031318_000060822018_00147_07215_0127.N1	18-Jul-03	03:13:18.259927	18-Jul-03	04:54:40.643981
RA2_FGD_2PNPDE20030718_045409_000061182018_00148_07216_0126.N1	18-Jul-03	04:54:09.507681	18-Jul-03	06:36:07.539734
RA2_FGD_2PNPDK20030718_063534_000062512018_00149_07217_0304.N1	18-Jul-03	06:35:34.175436	18-Jul-03	08:19:44.773477
RA2_FGD_2PNPDK20030718_063534_000000072018_00149_07217_0313.N1	18-Jul-03	06:35:34.175436	18-Jul-03	06:35:40.803735
RA2_FGD_2PNPDK20030718_081911_000059742018_00150_07218_0305.N1	18-Jul-03	08:19:11.409180	18-Jul-03	09:58:45.735241
RA2_FGD_2PNPDK20030718_095803_000060362018_00151_07219_0306.N1	18-Jul-03	09:58:03.458944	18-Jul-03	11:38:39.054999
RA2_FGD_2PNPDK20030718_113807_000060012018_00152_07220_0307.N1	18-Jul-03	11:38:07.918701	18-Jul-03	13:18:08.980759
RA2_FGD_2PNPDK20030718_131735_000058952018_00153_07221_0308.N1	18-Jul-03	13:17:35.616460	18-Jul-03	14:55:50.848524
RA2_FGD_2PNPDK20030718_145517_000050582018_00154_07222_0309.N1	18-Jul-03	14:55:17.484224	18-Jul-03	16:19:34.988289
RA2_FGD_2PNPDK20030802_152253_000059152018_00369_07437_0493.N1	02-Aug-03	15:22:53.188670	02-Aug-03	17:01:28.472730
RA2_FGD_2PNPDK20030802_170030_000059652018_00370_07438_0492.N1	02-Aug-03	17:00:30.600429	02-Aug-03	18:39:56.014485
RA2_FGD_2PNPDK20030802_183836_000060002018_00371_07439_0491.N1	02-Aug-03	18:38:36.976186	02-Aug-03	20:18:36.924242
RA2_FGD_2PNPDK20030802_201653_000062882018_00372_07440_0494.N1	02-Aug-03	20:16:53.377942	02-Aug-03	22:01:41.851998

RA2_FGD_2PNPDE20030802_220045_000063552018_00373_07441_0209.N1	02-Aug-03	22:00:45.093694	02-Aug-03	23:46:40.407750
RA2_FGD_2PNPDE20030802_234607_000061532018_00374_07442_0210.N1	02-Aug-03	23:46:07.043452	03-Aug-03	01:28:39.609504
RA2_FGD_2PNPDE20030803_012806_000061682018_00375_07443_0211.N1	03-Aug-03	01:28:06.245206	03-Aug-03	03:10:54.407257
RA2_FGD_2PNPDE20030803_031023_000060752018_00376_07444_0212.N1	03-Aug-03	03:10:23.270958	03-Aug-03	04:51:37.857013
RA2_FGD_2PNPDE20030803_045106_000061302018_00377_07445_0213.N1	03-Aug-03	04:51:06.720714	03-Aug-03	06:33:17.006766
RA2_FGD_2PNPDK20030803_063233_000062952018_00378_07446_0481.N1	03-Aug-03	06:32:33.616467	03-Aug-03	08:17:28.774509
RA2_FGD_2PNPDK20030803_081656_000059312018_00379_07447_0482.N1	03-Aug-03	08:16:56.524211	03-Aug-03	09:55:47.404275
RA2_FGD_2PNPDK20030803_095505_000003502018_00380_07448_0484.N1	03-Aug-03	09:55:05.127975	03-Aug-03	10:00:54.682212
RA2_FGD_2PNPDK20030815_051518_000063302018_00549_07617_0639.N1	15-Aug-03	05:15:18.356857	15-Aug-03	07:00:48.048896
RA2_FGD_2PNPDK20030815_070006_000059122018_00550_07618_0640.N1	15-Aug-03	07:00:06.886600	15-Aug-03	08:38:38.828668

Table 3: List of L2 FGD Files affected by S-Band anomaly during cycle 18

7.2 RA-2 Altimeter Parameters

7.2.1 ALTIMETER RANGE

No current results for the time being. Monitoring of the RA-2 FD altimetric range is planned to be done along with the upgrade of the DORIS navigator data processing for the NRT orbit computation.

7.2.2 SIGNIFICANT WAVE HEIGHT

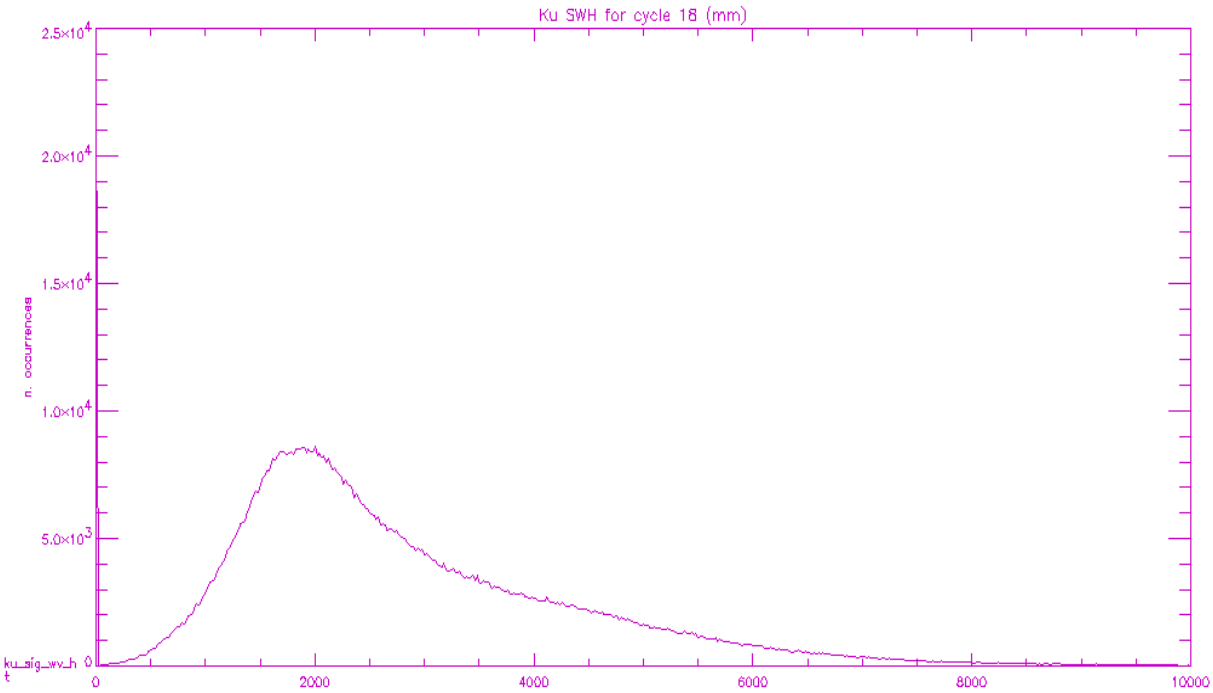


Figure 7: Histogram of Ku SWH for cycle 18 (mm)

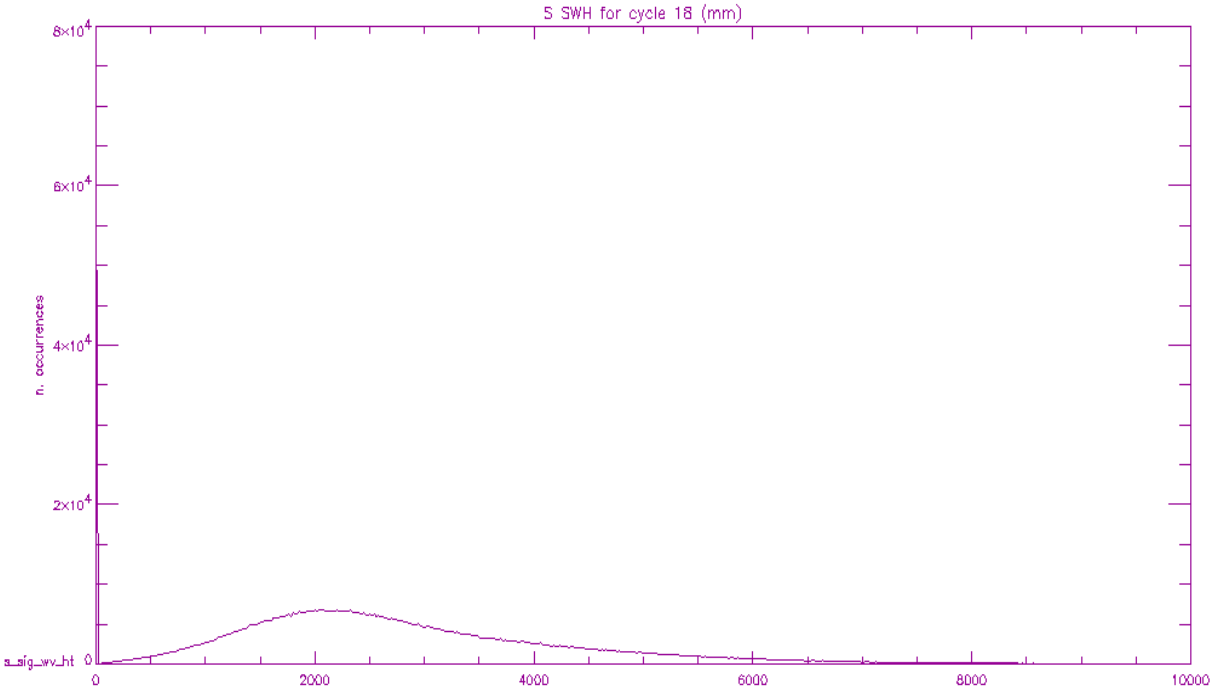


Figure 8: Histogram of S SWH for cycle 18 (mm)

7.2.3 BACKSCATTER COEFFICIENT – WIND SPEED

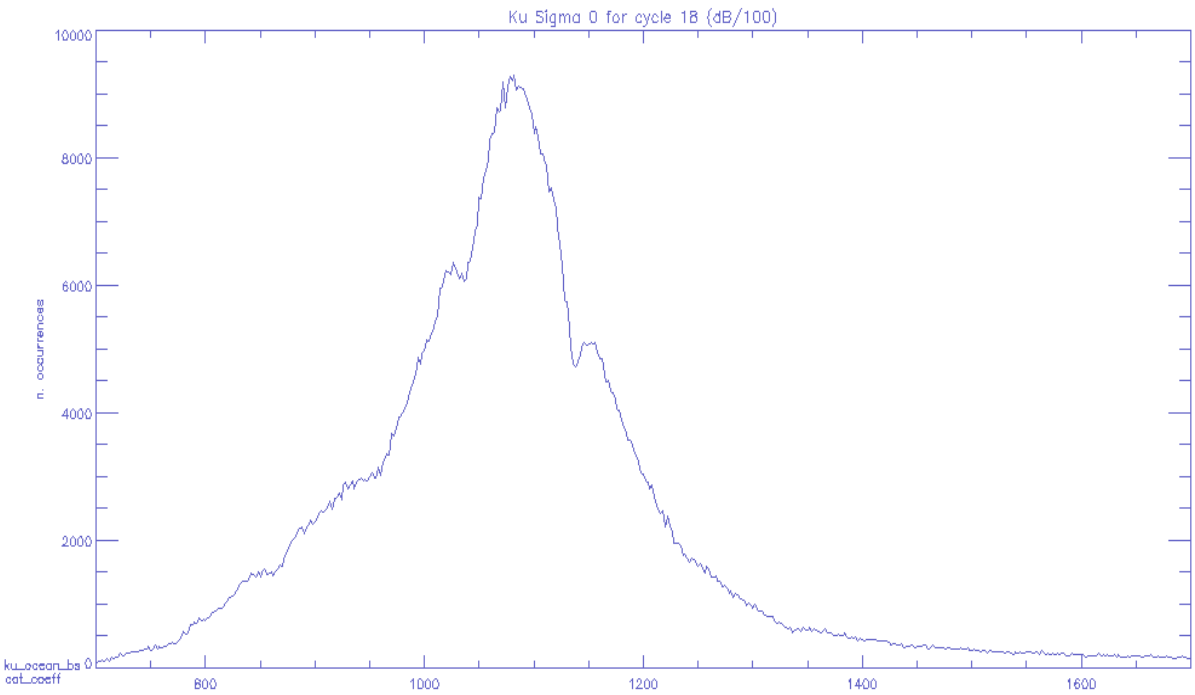


Figure 9: Histogram of Ku Backscattering Coefficient for cycle 18 (dB/100)

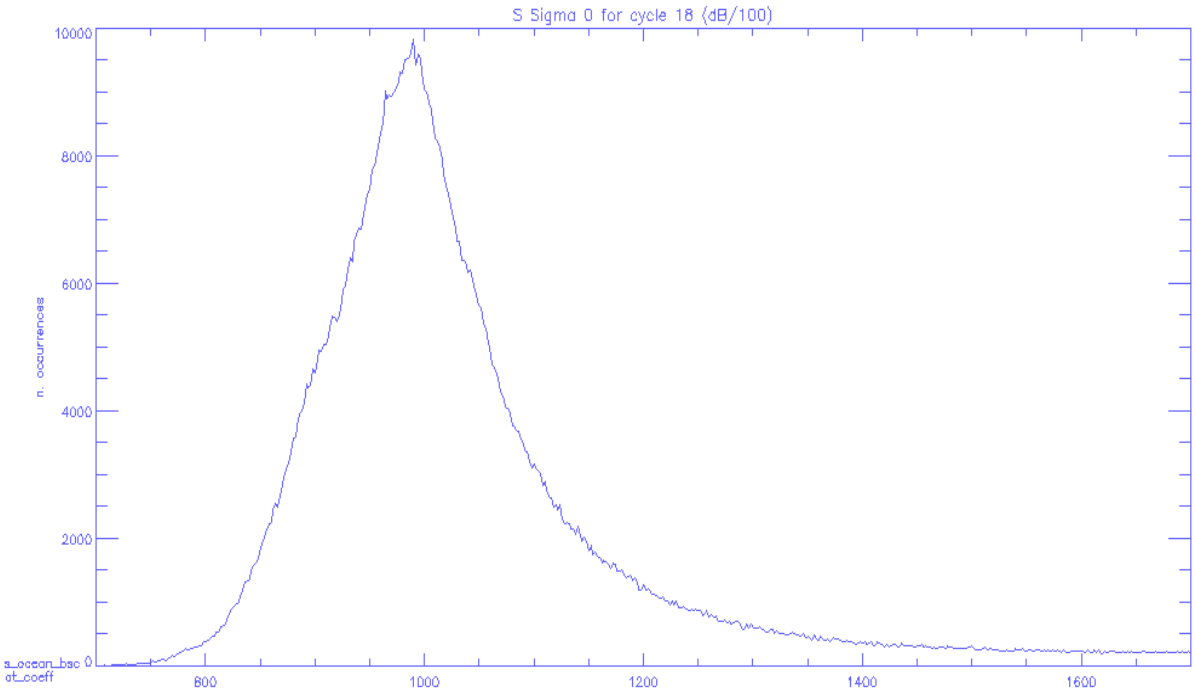


Figure 10: Histogram of S Backscattering Coefficient for cycle 18 (dB/100)

The peak observed in the Ku and S backscattering histograms reported for cycle 17 was due to a problem of the reporting tool. The problem is now solved and indeed no peak is noticeable anymore, also for the cycle 17 data.

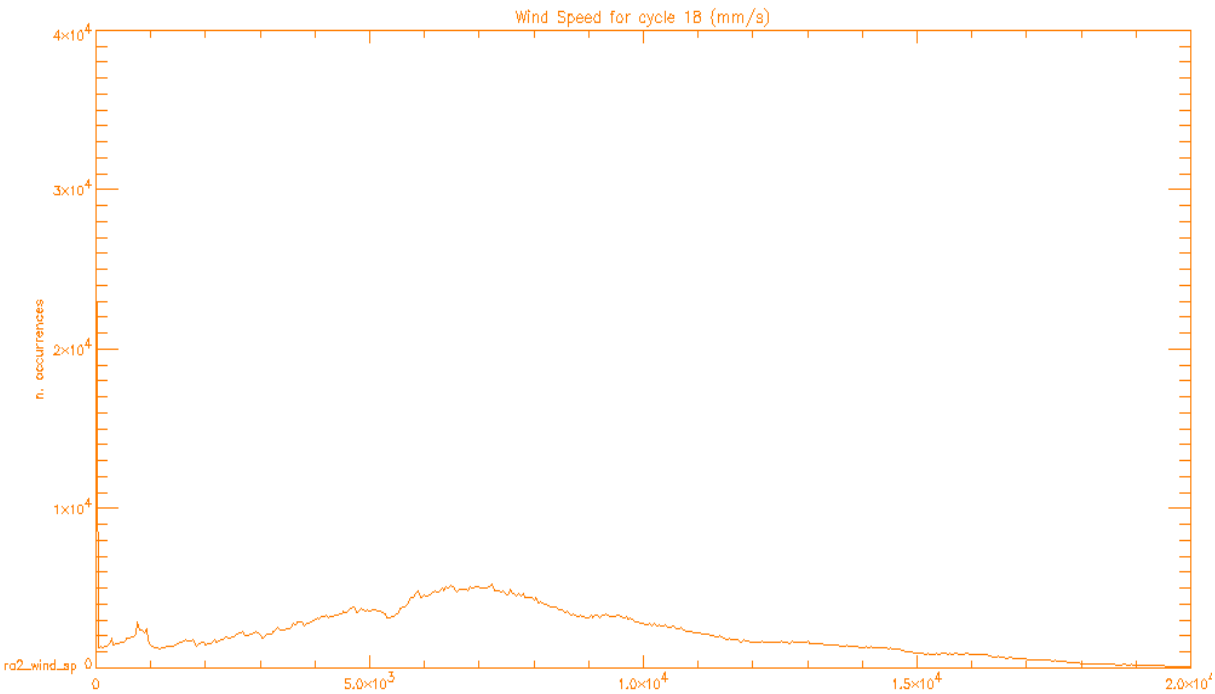


Figure 11: Histogram of Ku Wind Speed for cycle 18 (mm/s)

7.3 MWR Performances

For MWR performances please refer to the applicable CLS Cyclic Report of the type of [R – 2].

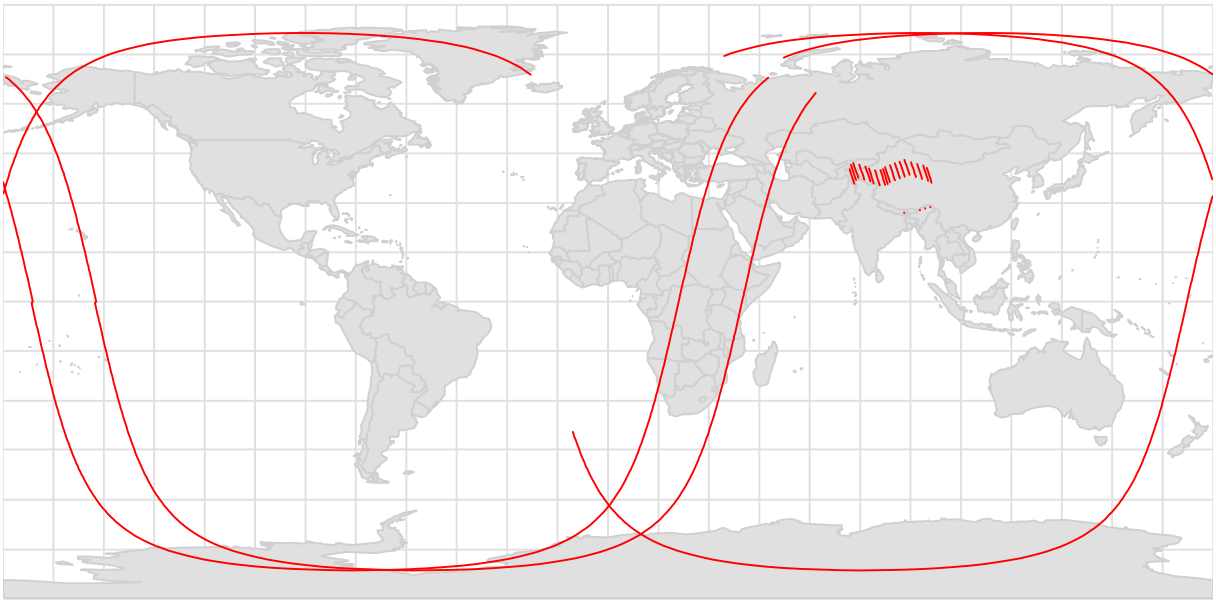
7.4 DORIS Performances

For DORIS performances refer to the applicable F-PAC Monthly Report of the type of [R - 1].

8 PRODUCT PERFORMANCES

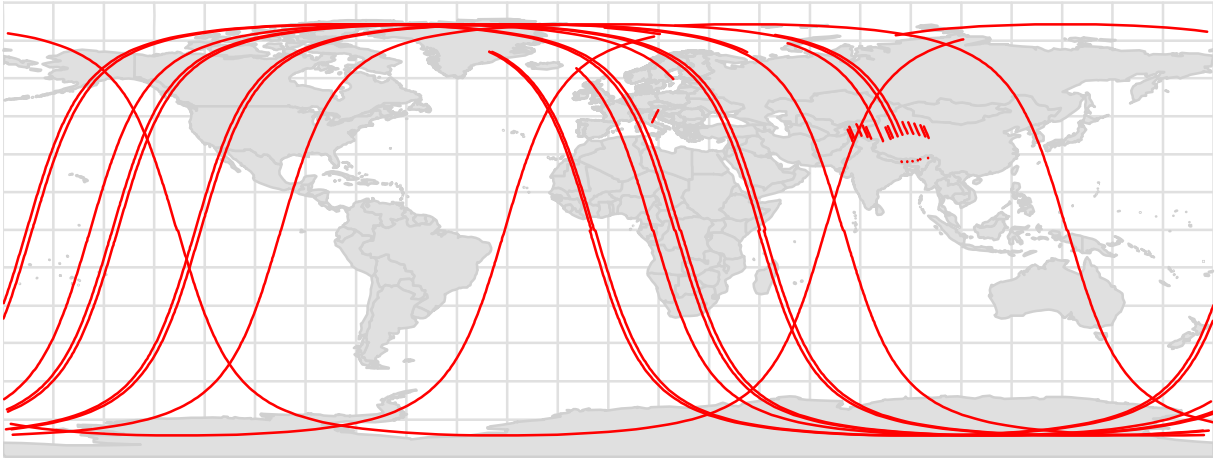
8.1 Availability of data

In Figure 12, Figure 13 and Table 4 the summary of unavailable RA-2 L0 products is given. During this cycle only one cause of unavailability was present: PDS failure (plotted in red). It is easy to notice that close to the Himalayan region a small gap is present daily, this is due to the daily instrument switch-off (Heater 2 mode) performed to prevent the S-Band anomaly to last more than one day.



MapInfo MapX Trial Version - Expires in 21 days.

Figure 12: RA-2 L0 unavailable products for first part of cycle 18 (7-25 July 2003)



MapInfo MapX Trial Version - Expires in 21 days.

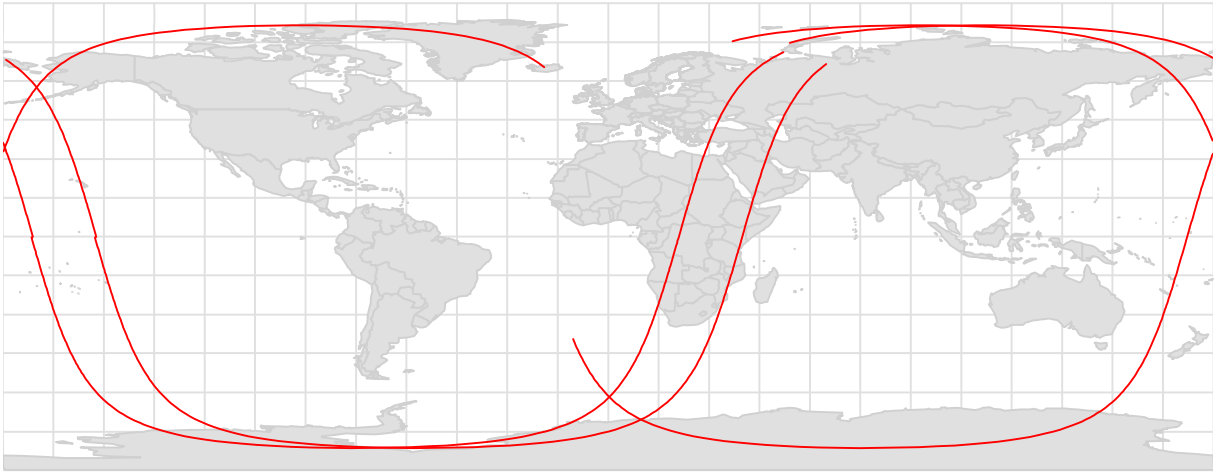
Figure 13: RA-2 L0 unavailable products for cycle second part of cycle 18 (25 July -11 August 2003)

Start date	Start time	Stop date	Stop time	Duration (s)	Start orbit	Stop orbit	Reason
08-Jul-03	16:36:40	08-Jul-03	16:37:58	78	7080	7080	PDS_UNKNOWN_FAILURE
09-Jul-03	16:04:37	09-Jul-03	16:05:55	78	7094	7094	PDS_UNKNOWN_FAILURE
10-Jul-03	15:30:48	10-Jul-03	15:30:51	3	7108	7108	PDS_UNKNOWN_FAILURE
10-Jul-03	15:33:52	10-Jul-03	15:35:10	78	7108	7108	PDS_UNKNOWN_FAILURE
11-Jul-03	07:00:37	11-Jul-03	08:37:54	5837	7117	7118	PDS_UNKNOWN_FAILURE
11-Jul-03	16:42:05	11-Jul-03	16:43:22	77	7123	7123	PDS_UNKNOWN_FAILURE
12-Jul-03	16:10:20	12-Jul-03	16:11:38	78	7137	7137	PDS_UNKNOWN_FAILURE
13-Jul-03	15:39:28	13-Jul-03	15:40:46	78	7151	7151	PDS_UNKNOWN_FAILURE
14-Jul-03	15:07:20	14-Jul-03	15:08:38	78	7165	7165	PDS_UNKNOWN_FAILURE
14-Jul-03	21:59:15	14-Jul-03	23:08:58	4183	7169	7169	PDS_UNKNOWN_FAILURE
15-Jul-03	08:13:58	15-Jul-03	09:52:29	5911	7175	7176	PDS_UNKNOWN_FAILURE
15-Jul-03	16:16:16	15-Jul-03	16:17:34	78	7180	7180	PDS_UNKNOWN_FAILURE
16-Jul-03	15:45:05	16-Jul-03	15:46:23	78	7194	7194	PDS_UNKNOWN_FAILURE
17-Jul-03	15:13:16	17-Jul-03	15:14:34	78	7208	7208	PDS_UNKNOWN_FAILURE
18-Jul-03	16:22:11	18-Jul-03	16:23:29	78	7223	7223	PDS_UNKNOWN_FAILURE
19-Jul-03	15:47:53	19-Jul-03	15:47:55	2	7237	7237	PDS_UNKNOWN_FAILURE
19-Jul-03	15:50:41	19-Jul-03	15:51:59	78	7237	7237	PDS_UNKNOWN_FAILURE
20-Jul-03	15:16:45	20-Jul-03	15:16:47	2	7251	7251	PDS_UNKNOWN_FAILURE
20-Jul-03	15:19:11	20-Jul-03	15:20:29	78	7251	7251	PDS_UNKNOWN_FAILURE
21-Jul-03	16:28:07	21-Jul-03	16:29:25	78	7266	7266	PDS_UNKNOWN_FAILURE
22-Jul-03	15:56:17	22-Jul-03	15:57:35	78	7280	7280	PDS_UNKNOWN_FAILURE

23-Jul-03	15:22:24	23-Jul-03	15:22:26	2	7294	7294	PDS_UNKNOWN_FAILURE
23-Jul-03	15:25:07	23-Jul-03	15:26:24	77	7294	7294	PDS_UNKNOWN_FAILURE
24-Jul-03	16:34:02	24-Jul-03	16:35:19	77	7309	7309	PDS_UNKNOWN_FAILURE
25-Jul-03	16:01:53	25-Jul-03	16:03:11	78	7323	7323	PDS_UNKNOWN_FAILURE
26-Jul-03	15:28:03	26-Jul-03	15:28:05	2	7337	7337	PDS_UNKNOWN_FAILURE
27-Jul-03	16:39:26	27-Jul-03	16:40:44	78	7352	7352	PDS_UNKNOWN_FAILURE
28-Jul-03	16:07:29	28-Jul-03	16:18:53	684	7366	7366	PDS_UNKNOWN_FAILURE
29-Jul-03	15:33:42	29-Jul-03	15:33:44	2	7380	7380	PDS_UNKNOWN_FAILURE
29-Jul-03	15:36:44	29-Jul-03	15:38:02	78	7380	7380	PDS_UNKNOWN_FAILURE
30-Jul-03	05:19:09	30-Jul-03	06:59:12	6003	7388	7389	PDS_UNKNOWN_FAILURE
30-Jul-03	16:44:51	30-Jul-03	16:46:09	78	7395	7395	PDS_UNKNOWN_FAILURE
31-Jul-03	18:06:30	31-Jul-03	18:07:37	67	7410	7410	PDS_UNKNOWN_FAILURE
31-Jul-03	19:41:29	31-Jul-03	21:23:20	6111	7411	7412	PDS_UNKNOWN_FAILURE
01-Aug-03	15:39:20	01-Aug-03	15:39:23	3	7423	7423	PDS_UNKNOWN_FAILURE
01-Aug-03	15:42:20	01-Aug-03	15:54:10	710	7423	7423	PDS_UNKNOWN_FAILURE
01-Aug-03	17:32:28	01-Aug-03	22:34:19	18111	7424	7427	PDS_UNKNOWN_FAILURE
02-Aug-03	15:10:21	02-Aug-03	15:11:39	78	7437	7437	PDS_UNKNOWN_FAILURE
03-Aug-03	16:19:16	03-Aug-03	16:20:34	78	7452	7452	PDS_UNKNOWN_FAILURE
04-Aug-03	15:45:02	04-Aug-03	15:45:05	3	7466	7466	PDS_UNKNOWN_FAILURE
04-Aug-03	15:47:55	04-Aug-03	22:40:05	24730	7466	7470	PDS_UNKNOWN_FAILURE
05-Aug-03	15:16:16	05-Aug-03	15:17:33	77	7480	7480	PDS_UNKNOWN_FAILURE
06-Aug-03	11:41:03	06-Aug-03	13:19:36	5913	7492	7493	PDS_UNKNOWN_FAILURE
06-Aug-03	16:25:11	06-Aug-03	16:26:29	78	7495	7495	PDS_UNKNOWN_FAILURE
07-Aug-03	09:37:38	07-Aug-03	09:37:58	20	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	09:38:03	07-Aug-03	09:39:00	57	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	15:50:47	07-Aug-03	15:50:50	3	7509	7509	PDS_UNKNOWN_FAILURE
07-Aug-03	15:53:31	07-Aug-03	15:54:48	77	7509	7509	PDS_UNKNOWN_FAILURE
08-Aug-03	15:19:35	08-Aug-03	15:19:38	3	7523	7523	PDS_UNKNOWN_FAILURE
08-Aug-03	15:22:10	08-Aug-03	15:23:28	78	7523	7523	PDS_UNKNOWN_FAILURE
09-Aug-03	16:31:05	09-Aug-03	16:32:23	78	7538	7538	PDS_UNKNOWN_FAILURE
10-Aug-03	15:59:06	10-Aug-03	16:00:24	78	7552	7552	PDS_UNKNOWN_FAILURE
11-Aug-03	15:28:05	11-Aug-03	15:29:23	78	7566	7566	PDS_UNKNOWN_FAILURE

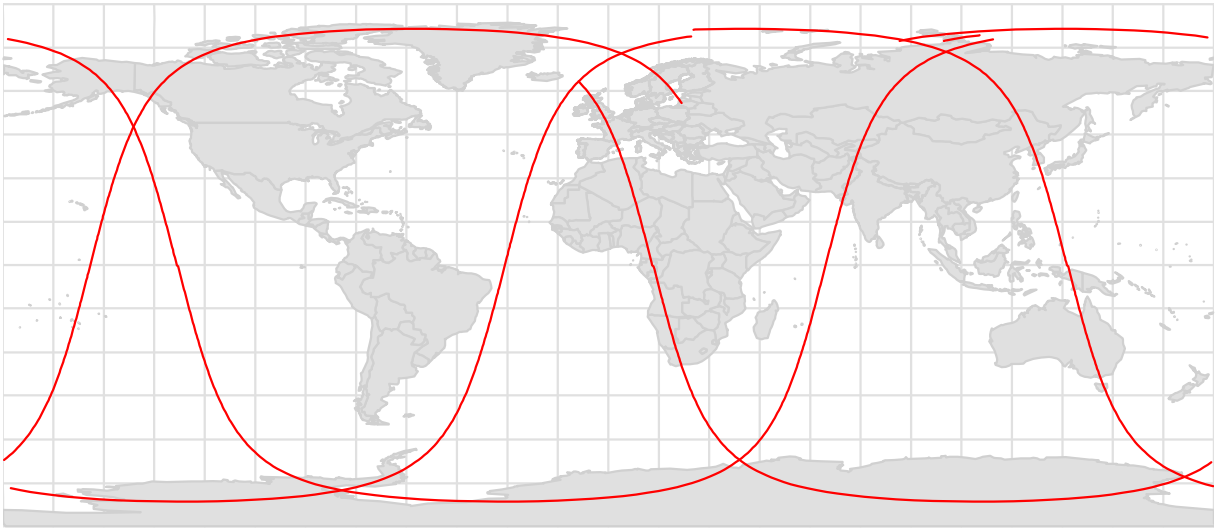
Table 4: List of gaps for RA-2 L0 products during cycle 18

In Figure 14, Figure 15and Table 5 the summary of unavailable MWR L0 products is given. Only gaps due to PDS failure since no unplanned MWR switch-off have happened during this cycle.



MapInfo MapX Trial Version - Expires in 16 days.

Figure 14: MWR L0 unavailable products for first part of cycle 18 (7-25 July 2003)



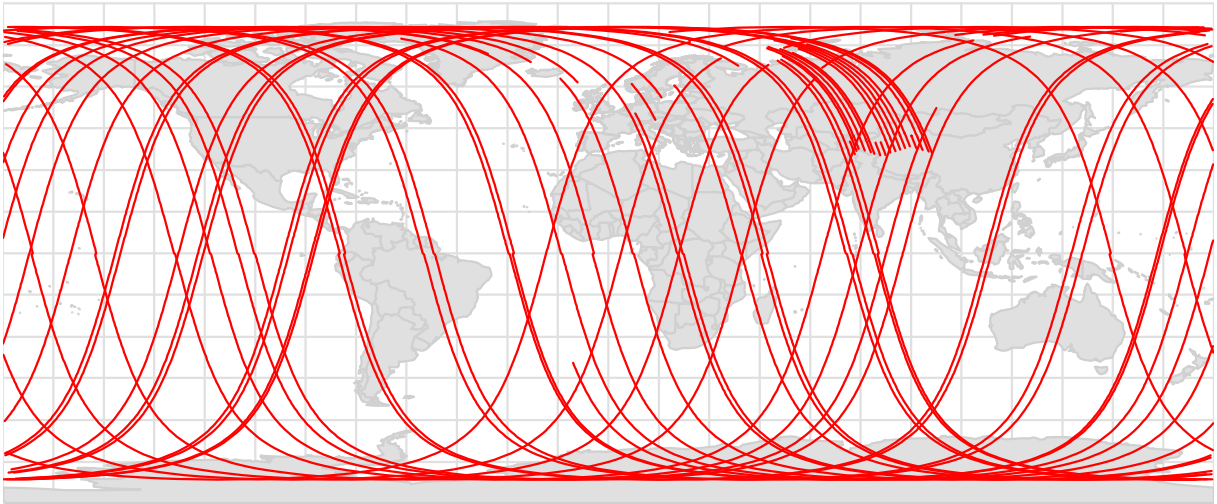
MapInfo MapX Trial Version - Expires in 16 days.

Figure 15: MWR L0 unavailable products for second part of cycle 18 (25 July-11 August 2003)

Start date	Start time	Stop date	Stop time	Duration (s)	Start orbit	Stop orbit	Reason
11-Jul-03	06:59:39	11-Jul-03	08:37:40	5881	7117	7118	PDS_UNKNOWN_FAILURE
14-Jul-03	21:58:11	14-Jul-03	23:08:59	4248	7169	7169	PDS_UNKNOWN_FAILURE
15-Jul-03	08:13:00	15-Jul-03	09:52:12	5952	7175	7176	PDS_UNKNOWN_FAILURE
30-Jul-03	05:18:18	30-Jul-03	06:59:06	6048	7388	7389	PDS_UNKNOWN_FAILURE
31-Jul-03	19:40:21	31-Jul-03	21:23:09	6168	7411	7412	PDS_UNKNOWN_FAILURE
06-Aug-03	11:40:09	06-Aug-03	13:19:21	5952	7492	7493	PDS_UNKNOWN_FAILURE
07-Aug-03	06:06:34	07-Aug-03	06:07:22	48	7503	7503	PDS_UNKNOWN_FAILURE

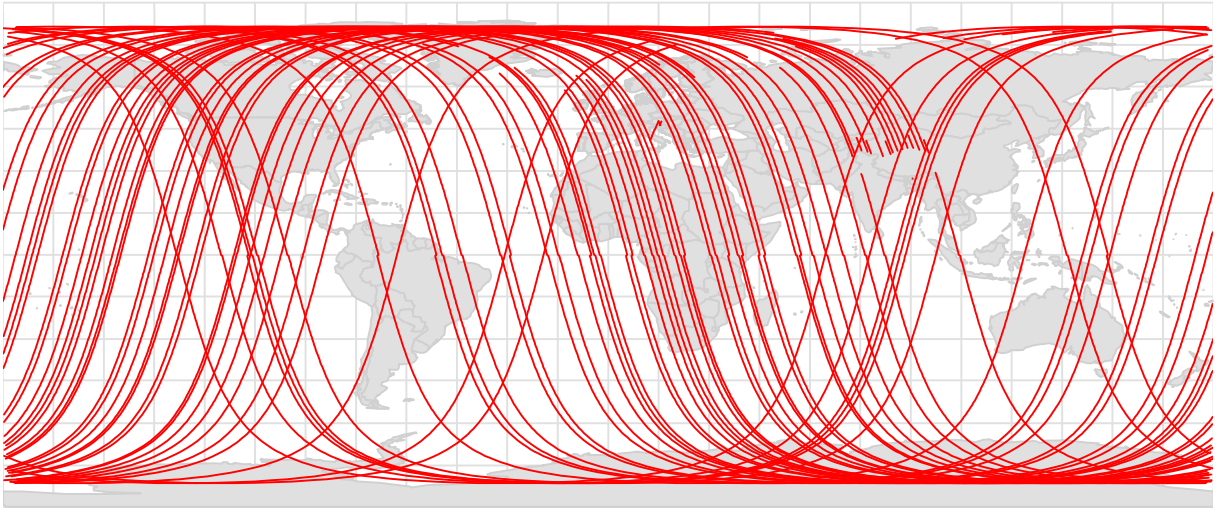
Table 5: List of gaps for MWR L0 products during cycle 18

In Figure 16, Figure 17and Table 6 the summary of unavailable RA-2 L1b products is given. In this case no distinction is made among the different types of gaps.



MapInfo MapX Trial Version - Expires in 21 days.

Figure 16: RA-2 L1b unavailable products for first part of cycle 18 (7-25 July 2003)



MapInfo MapX Trial Version - Expires in 18 days.

Figure 17: RA-2 L1b unavailable products for second part of cycle 18 (25 July-11 August 2003)

Start date	Start time	Stop date	Stop time	Duration (s)	Start orbit	Stop orbit	Reason
08-Jul-03	16:36:40	08-Jul-03	16:37:58	78	7080	7080	PDS_UNKNOWN_FAILURE
08-Jul-03	16:37:58	08-Jul-03	16:46:37	519	7080	7080	PDS_UNKNOWN_FAILURE
08-Jul-03	20:03:22	08-Jul-03	21:45:57	6155	7082	7083	PDS_UNKNOWN_FAILURE
09-Jul-03	04:37:53	09-Jul-03	06:18:15	6022	7087	7088	PDS_UNKNOWN_FAILURE
09-Jul-03	16:04:37	09-Jul-03	16:05:55	78	7094	7094	PDS_UNKNOWN_FAILURE
10-Jul-03	04:14:13	10-Jul-03	05:46:37	5544	7101	7102	PDS_UNKNOWN_FAILURE
10-Jul-03	10:49:26	10-Jul-03	12:28:34	5948	7105	7106	PDS_UNKNOWN_FAILURE
10-Jul-03	15:33:52	10-Jul-03	15:35:10	78	7108	7108	PDS_UNKNOWN_FAILURE
10-Jul-03	15:35:10	10-Jul-03	15:44:44	574	7108	7108	PDS_UNKNOWN_FAILURE
11-Jul-03	00:09:12	11-Jul-03	01:50:44	6092	7113	7114	PDS_UNKNOWN_FAILURE
11-Jul-03	07:00:38	11-Jul-03	08:37:54	5836	7117	7118	PDS_UNKNOWN_FAILURE
11-Jul-03	16:42:05	11-Jul-03	16:43:22	77	7123	7123	PDS_UNKNOWN_FAILURE
12-Jul-03	16:10:20	12-Jul-03	16:11:38	78	7137	7137	PDS_UNKNOWN_FAILURE
12-Jul-03	18:00:16	12-Jul-03	19:38:45	5909	7138	7139	PDS_UNKNOWN_FAILURE
13-Jul-03	15:39:28	13-Jul-03	15:40:46	78	7151	7151	PDS_UNKNOWN_FAILURE
13-Jul-03	15:40:46	13-Jul-03	20:44:49	18243	7151	7154	PDS_UNKNOWN_FAILURE
13-Jul-03	22:31:47	14-Jul-03	00:15:46	6239	7155	7156	PDS_UNKNOWN_FAILURE
14-Jul-03	01:58:08	14-Jul-03	03:39:37	6089	7157	7158	PDS_UNKNOWN_FAILURE
14-Jul-03	05:21:34	14-Jul-03	07:05:20	6226	7159	7160	PDS_UNKNOWN_FAILURE
14-Jul-03	15:07:20	14-Jul-03	15:08:38	78	7165	7165	PDS_UNKNOWN_FAILURE
14-Jul-03	15:08:38	14-Jul-03	16:57:44	6546	7165	7166	PDS_UNKNOWN_FAILURE

14-Jul-03	21:59:16	14-Jul-03	23:08:58	4182	7169	7169	PDS_UNKNOWN_FAILURE
15-Jul-03	08:13:59	15-Jul-03	09:52:29	5910	7175	7176	PDS_UNKNOWN_FAILURE
15-Jul-03	16:16:16	15-Jul-03	16:17:34	78	7180	7180	PDS_UNKNOWN_FAILURE
15-Jul-03	16:17:34	15-Jul-03	16:26:52	558	7180	7180	PDS_UNKNOWN_FAILURE
16-Jul-03	09:22:17	16-Jul-03	11:00:43	5906	7190	7191	PDS_UNKNOWN_FAILURE
16-Jul-03	15:45:05	16-Jul-03	15:46:23	78	7194	7194	PDS_UNKNOWN_FAILURE
16-Jul-03	15:46:23	17-Jul-03	05:26:40	49217	7194	7202	PDS_UNKNOWN_FAILURE
17-Jul-03	15:13:16	17-Jul-03	15:14:34	78	7208	7208	PDS_UNKNOWN_FAILURE
17-Jul-03	15:14:34	17-Jul-03	17:03:21	6527	7208	7209	PDS_UNKNOWN_FAILURE
18-Jul-03	16:22:11	18-Jul-03	16:23:29	78	7223	7223	PDS_UNKNOWN_FAILURE
18-Jul-03	16:23:29	18-Jul-03	16:33:05	576	7223	7223	PDS_UNKNOWN_FAILURE
18-Jul-03	21:31:13	18-Jul-03	23:16:48	6335	7226	7227	PDS_UNKNOWN_FAILURE
19-Jul-03	15:50:41	19-Jul-03	15:51:59	78	7237	7237	PDS_UNKNOWN_FAILURE
19-Jul-03	15:51:59	19-Jul-03	16:02:33	634	7237	7237	PDS_UNKNOWN_FAILURE
20-Jul-03	15:19:11	20-Jul-03	15:20:29	78	7251	7251	PDS_UNKNOWN_FAILURE
20-Jul-03	15:20:29	20-Jul-03	15:31:14	645	7251	7251	PDS_UNKNOWN_FAILURE
20-Jul-03	20:24:04	20-Jul-03	20:27:48	224	7254	7254	PDS_UNKNOWN_FAILURE
21-Jul-03	16:28:07	21-Jul-03	16:29:25	78	7266	7266	PDS_UNKNOWN_FAILURE
21-Jul-03	16:29:25	21-Jul-03	16:39:06	581	7266	7266	PDS_UNKNOWN_FAILURE
22-Jul-03	15:56:17	22-Jul-03	15:57:35	78	7280	7280	PDS_UNKNOWN_FAILURE
22-Jul-03	15:57:35	22-Jul-03	16:07:16	581	7280	7280	PDS_UNKNOWN_FAILURE
23-Jul-03	15:25:07	23-Jul-03	15:26:24	77	7294	7294	PDS_UNKNOWN_FAILURE
23-Jul-03	15:26:24	23-Jul-03	15:26:25	1	7294	7294	PDS_UNKNOWN_FAILURE
24-Jul-03	16:34:02	24-Jul-03	16:35:19	77	7309	7309	PDS_UNKNOWN_FAILURE
24-Jul-03	16:35:19	24-Jul-03	16:44:42	563	7309	7309	PDS_UNKNOWN_FAILURE
25-Jul-03	19:32:25	25-Jul-03	22:52:40	12015	7325	7327	PDS_UNKNOWN_FAILURE
27-Jul-03	00:06:34	27-Jul-03	01:48:27	6113	7342	7343	PDS_UNKNOWN_FAILURE
27-Jul-03	15:11:53	27-Jul-03	16:37:20	5127	7351	7352	PDS_UNKNOWN_FAILURE
27-Jul-03	16:39:26	27-Jul-03	16:40:44	78	7352	7352	PDS_UNKNOWN_FAILURE
27-Jul-03	16:40:44	28-Jul-03	02:58:22	37058	7352	7358	PDS_UNKNOWN_FAILURE
28-Jul-03	16:07:29	28-Jul-03	16:18:53	684	7366	7366	PDS_UNKNOWN_FAILURE
28-Jul-03	16:18:53	28-Jul-03	21:17:08	17895	7366	7369	PDS_UNKNOWN_FAILURE
29-Jul-03	10:52:45	29-Jul-03	12:31:07	5902	7377	7378	PDS_UNKNOWN_FAILURE
29-Jul-03	15:36:44	29-Jul-03	15:38:02	78	7380	7380	PDS_UNKNOWN_FAILURE
29-Jul-03	15:38:02	29-Jul-03	15:48:20	618	7380	7380	PDS_UNKNOWN_FAILURE
29-Jul-03	19:05:11	29-Jul-03	20:39:18	5647	7382	7383	PDS_UNKNOWN_FAILURE
29-Jul-03	20:39:18	29-Jul-03	20:39:38	20	7383	7383	PDS_UNKNOWN_FAILURE
29-Jul-03	20:39:43	29-Jul-03	22:27:24	6461	7383	7384	PDS_UNKNOWN_FAILURE
30-Jul-03	05:19:10	30-Jul-03	06:59:12	6002	7388	7389	PDS_UNKNOWN_FAILURE
30-Jul-03	16:44:51	30-Jul-03	16:46:09	78	7395	7395	PDS_UNKNOWN_FAILURE
30-Jul-03	16:46:09	30-Jul-03	21:53:25	18436	7395	7398	PDS_UNKNOWN_FAILURE
31-Jul-03	03:04:47	31-Jul-03	04:45:57	6070	7401	7402	PDS_UNKNOWN_FAILURE
31-Jul-03	18:06:30	31-Jul-03	18:07:37	67	7410	7410	PDS_UNKNOWN_FAILURE
31-Jul-03	18:07:37	31-Jul-03	19:41:29	5632	7410	7411	PDS_UNKNOWN_FAILURE

31-Jul-03	19:41:29	31-Jul-03	21:23:20	6111	7411	7412	PDS_UNKNOWN_FAILURE
01-Aug-03	15:39:21	01-Aug-03	15:39:23	2	7423	7423	PDS_UNKNOWN_FAILURE
01-Aug-03	15:42:20	01-Aug-03	15:54:10	710	7423	7423	PDS_UNKNOWN_FAILURE
01-Aug-03	17:32:29	01-Aug-03	22:34:19	18110	7424	7427	PDS_UNKNOWN_FAILURE
01-Aug-03	22:34:19	02-Aug-03	00:18:11	6232	7427	7428	PDS_UNKNOWN_FAILURE
02-Aug-03	03:42:40	02-Aug-03	05:23:42	6062	7430	7431	PDS_UNKNOWN_FAILURE
02-Aug-03	13:45:24	02-Aug-03	15:08:21	4977	7436	7437	PDS_UNKNOWN_FAILURE
02-Aug-03	15:10:21	02-Aug-03	15:11:39	78	7437	7437	PDS_UNKNOWN_FAILURE
03-Aug-03	16:19:16	03-Aug-03	16:20:34	78	7452	7452	PDS_UNKNOWN_FAILURE
04-Aug-03	09:31:49	04-Aug-03	09:32:13	24	7462	7462	PDS_UNKNOWN_FAILURE
04-Aug-03	15:47:55	04-Aug-03	22:40:05	24730	7466	7470	PDS_UNKNOWN_FAILURE
05-Aug-03	03:48:19	05-Aug-03	05:28:57	6038	7473	7474	PDS_UNKNOWN_FAILURE
05-Aug-03	15:16:16	05-Aug-03	15:17:33	77	7480	7480	PDS_UNKNOWN_FAILURE
05-Aug-03	15:17:33	05-Aug-03	15:29:02	689	7480	7480	PDS_UNKNOWN_FAILURE
05-Aug-03	20:20:43	05-Aug-03	20:21:08	25	7483	7483	PDS_UNKNOWN_FAILURE
06-Aug-03	11:41:04	06-Aug-03	13:19:36	5912	7492	7493	PDS_UNKNOWN_FAILURE
06-Aug-03	16:25:11	06-Aug-03	16:26:29	78	7495	7495	PDS_UNKNOWN_FAILURE
06-Aug-03	16:26:29	06-Aug-03	23:18:57	24748	7495	7499	PDS_UNKNOWN_FAILURE
07-Aug-03	04:25:11	07-Aug-03	06:07:22	6131	7502	7503	PDS_UNKNOWN_FAILURE
07-Aug-03	09:37:33	07-Aug-03	09:37:38	5	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	09:37:38	07-Aug-03	09:37:58	20	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	09:38:03	07-Aug-03	09:39:00	57	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	09:39:06	07-Aug-03	09:39:24	18	7505	7505	PDS_UNKNOWN_FAILURE
07-Aug-03	15:53:31	07-Aug-03	15:54:48	77	7509	7509	PDS_UNKNOWN_FAILURE
07-Aug-03	15:54:48	07-Aug-03	16:04:38	590	7509	7509	PDS_UNKNOWN_FAILURE
07-Aug-03	22:47:03	08-Aug-03	00:29:59	6176	7513	7514	PDS_UNKNOWN_FAILURE
08-Aug-03	03:54:07	08-Aug-03	05:35:56	6109	7516	7517	PDS_UNKNOWN_FAILURE
08-Aug-03	15:22:10	08-Aug-03	15:23:28	78	7523	7523	PDS_UNKNOWN_FAILURE
08-Aug-03	15:23:28	08-Aug-03	17:11:14	6466	7523	7524	PDS_UNKNOWN_FAILURE
08-Aug-03	23:58:45	09-Aug-03	01:39:28	6043	7528	7529	PDS_UNKNOWN_FAILURE
09-Aug-03	16:31:05	09-Aug-03	16:32:23	78	7538	7538	PDS_UNKNOWN_FAILURE
10-Aug-03	15:59:06	10-Aug-03	16:00:24	78	7552	7552	PDS_UNKNOWN_FAILURE
11-Aug-03	15:28:05	11-Aug-03	15:29:23	78	7566	7566	PDS_UNKNOWN_FAILURE

Table 6: List of gaps for RA-2 L1b products during cycle 18

8.2 Edited measurements

In order to produce the statistics reported in 7.2 the following editing criteria have been used:

Parameter	Surface type	Zone	Range
Ku SWH	Open Ocean	All world	[0, 12] (m)

Ku Backscattering Coeff.	Open ocean	All world	[2, 17] (dBs)
Ku Wind Speed	Open ocean	All world	[0, 22] (m/s)

Table 7: Editing criteria for RA-2 parameters statistics

8.3 Product Disclaimer

For the product disclaimers please refer to the following web link:
http://envisat.esa.int/dataproducts/availability/

8.4 Geophysical quality assessment

Refer to the ECMWF report given in [R – 9].

9 INSTRUMENT LONG TERM MONITORING

For the time being, considering the available amount of data analyzed, no long-term monitoring is possible

10 PARTICULAR INVESTIGATIONS

During this cycle a special investigation has been performed on the Ultra Stable Clock period handling within the Near Real time Level 1B processing. Investigations results shall be provided in the next ECAR report.