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ENVISAT MIPAS Bi-Monthly Report: March - April 2005

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reference/*réference* ENVI-SPPA-EOPG-TN-05-0012
issue/*édition* 1
revision/*révision* 0
date of issue/*date d'édition* 26 May 2005
status/*état* Final
Document type/*type de document* Technical Note
Distribution/*distribution*

European Space Agency
Agence spatiale européenne

APPROVAL

Title *titre*	ENVISAT MIPAS Bi-Monthly Report: March - April 2005	issue *issue* 1	revision *revision* 0

author *auteur*	R. Mantovani	date *date*	26 May 2005

approved by *approuvé by*	R. Koopman	date *date*	26 May 2005

CHANGE LOG

reason for change */raison du changement*	issue/*issue*	revision/*revision*	date/*date*

CHANGE RECORD

Issue: 1 Revision: 0

reason for change/*raison du changement*	page(s)/*page(s)*	paragraph(s)/*paragraph(s)*

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1 INTRODUCTION

The MIPAS Bi-Monthly Report (BMR) documents the current status and recent changes to the MIPAS instrument, its data processing chain, and its data products.

The BMR is composed of analysis results obtained by the Product Control Facility (PCF), combined with inputs received from the different groups working on MIPAS operation, calibration, product validation and data quality. The following groups participate in the MIPAS Quality Working Group (QWG):

- ESRIN-PCF
- ESOC
- ESTEC
- ABB BOMEM
- Oxford University
- IFAC-CNR
- EADS-Astrium GmbH
- Leicester University
- LISA
- IMK
- University of Bologna,
- ISAC,
- IAA
- DLR
- ECMWF

In addition, the group interfaces with the Atmospheric Chemistry Validation Team (ACVT).

1.1 Scope

The main objective of the BMR is to give, on a regular basis, the status of MIPAS instrument performance, data acquisition, results of anomaly investigations, calibration activities and validation campaigns.

1.2 Acronyms and Abbreviations

ACVT	Atmospheric Chemistry Validation Team
ADF	Auxiliary Data File
ADS	Annotated Data Set
ANX	Ascending Node Crossing
AE	Aircraft Emission
AR	Anomaly Report
BMR	Bi-Monthly Report

CBB	Calibration Black-Body
CTI	Configuration Table Interface
DPM	Detailed Processing Model
DS	Deep Space
DSD	Data Set Description
ECMWF	European Centre for Medium-Range Weather Forecasts
FCE	Fringe Count Error
FOCC	Flight Operation Control Centre
HD	Help-Desk
IDU	Interferometer Drive Unit
IF	In-Flight
IG	Initial Guess
ILS	Instrument Line Shape
INT	Interferometer
I/O DD	Input/Output Data Definition
IPF	Instrument Processing Facility
LOS	Line of Sight
MA	Middle Atmosphere
MDS	Measurements Data Set
MIPAS	Michelson Interferometer for Passive Atmospheric Sounding
MPH	Main Product Header
MW	Micro-Window
NCR	Non-Conformance Report
NESR	Noise Equivalent Spectral Radiance
NOM	Nominal
NRT	Near-Real-Time
OFL	Off-Line
PCD	Product Confidence Data
PCF	Product Control Facility
PDS	Payload Data Segment
QWG	Quality Working Group
RGC	Radiometric Gain Calibration
SEM	Special Event Measurement
SPH	Specific Product header
SPR	Software Problem Report
UA	Upper Atmosphere
UTLS	Upper Troposphere Lower Stratosphere
VCM	Variance Covariance Matrix
VMR	Volume Mixing Ratio
WCC	Wear Control Cycle
1RR	Single Slide Reduced Resolution
2RR	Double Slide Reduced Resolution

2 THE REPORT

2.1 Summary

- Eighteen unavailability have been caused by IDU velocity error. Mainly they occurred in correspondence of long measurements period, so reducing the duty-cycle there is a possibility to reduce the unavailability.
- Currently the Near-Real Time (NRT) mission is suspended, and no systematic operational Off-Line (OFL) processing is performed as processing algorithms are being adapted to the new observation modes.
- During March and April 2005 the following Special and In-Flight Re-Characterization measurements have been done: MA, UA, UTLS-1, IF 9, IF 11 and IF 16.
- An instrument temperature increase around 5 k has been observed over March and April 2005. That trend is under investigation in order to understand whether this is an anomalous behaviour or a normal seasonal increase.
- An increase has been observed also in the Compressor vibration level. The Compressor balance will be re-set in May in order to reduce the vibration level.
- Also the radiometric gain showed an evident increase from re-start of mission and also this potential anomaly is under investigation.

2.2 Unavailability

2.2.1 INSTRUMENT UNAVAILABILITY

During March and April 2005 operations, MIPAS switched to Heater/Refuse mode due to IDU velocity error during the following time intervals:

Start time: 2 Mar 2005 10:46:59.000, 15708
Stop time: 2 Mar 2005 12:20:36.000, 15709

Start time: 7 Mar 2005 11:41:52.000, 15780
Stop time: 7 Mar 2005 13:03:43.000, 15781

Start time: 21 Mar 2005 04:40:44.000, 15976
Stop time: 21 Mar 2005 05:41:05.000, 15977

Start time: 21 Mar 2005 05:54:19.000, 15977
Stop time: 21 Mar 2005 07:21:41.000, 15978

Start time: 21 Mar 2005 09:48:21.000, 15979
Stop time: 21 Mar 2005 10:42:52.000, 15980

Start time: 22 Mar 2005 09:21:44.000, 15993

Stop time: 22 Mar 2005 10:11:16.000, 15994

Start time: 23 Mar 2005 07:43:06.000, 16006
Stop time: 23 Mar 2005 07:59:03.000, 16007

Start time: 27 Mar 2005 15:23:26.000, 16068
Stop time: 27 Mar 2005 15:56:11.000, 16069

Start time: 28 Mar 2005 02:24:27.000, 16075
Stop time: 28 Mar 2005 03:40:22.000, 16076

Start time: 4 Apr 2005 14:21:29.000, 16182
Stop time: 4 Apr 2005 15:04:28.000, 16183

Start time: 4 Apr 2005 20:53:31.370, 16186
Stop time: 4 Apr 2005 21:46:52.000, 16187

Start time: 6 Apr 2005 05:38:29.000, 16206
Stop time: 6 Apr 2005 07:18:51.000, 16207

Start time: 19 Apr 2005 12:44:19.000, 16396
Stop time: 19 Apr 2005 13:52:14.000, 16397

Start time: 25 Apr 2005 09:11:07.000, 16480
Stop time: 25 Apr 2005 12:23:36.000, 16482

Start time: 26 Apr 2005 03:29:13.000, 16491
Stop time: 26 Apr 2005 05:09:35.000, 16492

Start time: 26 Apr 2005 13:32:49.000, 16497
Stop time: 26 Apr 2005 15:13:11.000, 16498

Start time: 27 Apr 2005 01:00:59.000, 16503
Stop time: 27 Apr 2005 01:16:46.000, 16504

Start time: 27 Apr 2005 02:57:37.000, 16505
Stop time: 27 Apr 2005 04:37:58.000, 16506

During March and April 2005 operations, MIPAS ICU went in RS/WT/INI during the following time interval:

Start time: 14 Mar 2005 21:06:53.000, 15886
Stop time: 16 Mar 2005 11:57:54.000, 15909

2.2.2 DATA GENERATION GAPS

Only Level 0 data coverage is reported below, as currently the Near-Real Time (NRT) mission is suspended, and no systematic operational Off-Line (OFL) processing is performed as processing algorithms are being adapted to the new observation modes.

Tab. 1 List of missing intervals for MIP_NL__0P: 1 March - 30 April 2005.

Start Time	Stop Time	Duration [s]	Start Orbit	Stop Orbit
02-mar-05 12.20.36	02-mar-05 12.20.51	15	15709	15709
05-mar-05 10.37.37	05-mar-05 10.37.51	14	15750	15750
07-mar-05 13.03.43	07-mar-05 13.03.58	15	15781	15781
08-mar-05 07.51.35	08-mar-05 11.11.17	11982	15792	15794
12-mar-05 10.17.50	12-mar-05 10.18.04	14	15850	15850
13-mar-05 10.02.50	13-mar-05 12.17.17	8067	15865	15866
13-mar-05 12.17.17	13-mar-05 12.24.22	425	15866	15866
13-mar-05 12.24.22	13-mar-05 12.24.22	0	15866	15866
13-mar-05 12.24.22	13-mar-05 12.31.27	425	15866	15866
13-mar-05 12.31.27	13-mar-05 13.32.43	3676	15866	15867
14-mar-05 21.06.51	14-mar-05 21.06.53	2	15886	15886
16-mar-05 11.57.54	16-mar-05 11.59.21	87	15909	15909
19-mar-05 09.58.10	19-mar-05 09.58.23	13	15950	15951
21-mar-05 05.41.05	21-mar-05 05.41.19	14	15977	15977
21-mar-05 07.21.41	21-mar-05 07.21.55	14	15978	15978
26-mar-05 09.38.04	26-mar-05 09.38.18	14	16050	16051
28-mar-05 03.40.22	28-mar-05 03.40.37	15	16076	16076
02-apr-05 10.54.03	02-apr-05 10.54.17	14	16151	16151
04-apr-05 21.46.52	04-apr-05 21.47.07	15	16187	16187
05-apr-05 05.23.07	05-apr-05 05.23.13	6	16191	16191
06-apr-05 05.34.26	06-apr-05 05.38.29	243	16206	16206
06-apr-05 07.18.51	06-apr-05 07.19.06	15	16207	16207
09-apr-05 10.34.07	09-apr-05 10.34.21	14	16251	16251
12-apr-05 17.44.09	12-apr-05 19.23.48	5979	16299	16300
16-apr-05 10.14.17	16-apr-05 10.14.31	14	16351	16351
23-apr-05 06.33.51	23-apr-05 06.38.31	280	16449	16450
26-apr-05 03.25.10	26-apr-05 05.09.50	6280	16491	16492
26-apr-05 13.28.45	26-apr-05 15.13.25	6280	16497	16498
27-apr-05 02.53.33	27-apr-05 04.38.13	6280	16505	16506
27-apr-05 17.58.56	27-apr-05 19.43.36	6280	16514	16515
30-apr-05 09.35.11	30-apr-05 09.35.26	15	16551	16551
23-apr-05 09.54.40	23-apr-05 09.54.54	14	16451	16451
25-apr-05 09.11.14	25-apr-05 12.23.50	11556	16480	16482
25-apr-05 19.12.39	25-apr-05 19.13.50	71	16486	16486
25-apr-05 19.13.50	25-apr-05 19.16.07	137	16486	16486

25-apr-05	19.16.07	25-apr-05	19.16.11	4	16486	16486
25-apr-05	19.16.11	25-apr-05	19.18.28	137	16486	16486
25-apr-05	19.18.28	25-apr-05	19.23.58	330	16486	16486
25-apr-05	20.53.14	25-apr-05	21.04.04	650	16487	16487

Tab. 2 List of missing intervals for MIP_LS__0P: 1 March - 30 April 2005.

Start Time		Stop Time		Duration [s]	Start Orbit	Stop Orbit
05-mar-05	07.22.53	05-mar-05	07.23.12	19	15749	15749
26-mar-05	07.19.17	26-mar-05	07.19.34	17	16049	16049
26-mar-05	09.37.13	26-mar-05	09.37.24	11	16050	16050
23-apr-05	06.39.31	23-apr-05	06.40.17	46	16450	16450
23-apr-05	06.40.58	23-apr-05	06.41.25	27	16450	16450
23-apr-05	07.07.03	23-apr-05	07.07.16	13	16450	16450
23-apr-05	06.42.39	23-apr-05	06.43.26	47	16450	16450
23-apr-05	06.46.19	23-apr-05	06.47.03	44	16450	16450
23-apr-05	06.49.34	23-apr-05	06.50.19	45	16450	16450
23-apr-05	06.52.17	23-apr-05	06.53.04	47	16450	16450
23-apr-05	06.54.16	23-apr-05	06.55.03	47	16450	16450
23-apr-05	06.57.29	23-apr-05	06.58.18	49	16450	16450
23-apr-05	06.59.14	23-apr-05	07.00.04	50	16450	16450
23-apr-05	07.00.57	23-apr-05	07.01.47	50	16450	16450

Tab. 3 List of missing intervals for MIP_RW__0P: 1 March - 30 April 2005.

Start Time		Stop Time		Duration [s]	Start Orbit	Stop Orbit
25-apr-05	19.13.12	25-apr-05	19.13.19	7	16486	16486
25-apr-05	19.13.50	25-apr-05	19.13.57	7	16486	16486
25-apr-05	19.16.01	25-apr-05	19.16.07	6	16486	16486
25-apr-05	19.16.11	25-apr-05	19.16.18	7	16486	16486
25-apr-05	19.18.22	25-apr-05	19.18.28	6	16486	16486
25-apr-05	19.18.49	25-apr-05	19.23.50	301	16486	16486
25-apr-05	20.53.41	25-apr-05	21.03.54	613	16487	16487

2.3 Instrument Configuration and Performance

2.3.1 MIPAS OPERATIONS

Here the Planning for the MIPAS operations for the period March - April 2005 is shortly described.

Planning strategy:

- All activities have been planned in nominal mode (double slide operation) with medium resolution (41% - 1.64 sec sweeps) with asymmetric transitory sweeps.
- Compensation times, transitory times and other planning parameters have been planned according to the new operational baseline.
- The new Nominal Scenario (using floating altitudes) defined by the 1st Science Team meeting will be commanded.
- According to the implementation of the Auto-recovery Sequence in the FOS-MPS, the new MPL_CAL_MP file has been generated as follow:
    - ILS: REPETITION=+001<orbit> ANX_TIME=+0200.000000;
    - RGC and WCC REPETITION fields set to zero.
- Radiometric Gain calibrations (RGC) have been planned using the MPL_ORS_MP file.
- The WCC activity cannot be explicitly requested trough the MPL_ORS_MP file, anyway it will be performed after every transition to Heater.
- No files related to the SEM activity have been sent (CTI_SEM, CTI_S22, CTI_S23).
- 2 LOS orbits during the week-end with the following inputs:
    - 2 consecutive PRIME orbits + 2 consecutive BACKUP orbits;
    - PITCH BIAS=-0.030<deg>, no harmonics (INT_AUX_MP.27);
    - EL_OFFSET=+000.100000<deg> and NUM_STEPS=+15 (INT_AUM_MP.23);
    - Rearward observations only.
- The new **Nominal scenario** (using **floating altitudes**) defined by the 1st Science Team meeting has been commanded: 1-4 March (15693-15736), 7-10 March 2005 (15778-15821), 20-23 March 2005 (15966-16009), 4-7 April 2005 (16179-16222), 25-28 April 2005 (16483-16523).
- The **Middle Atmosphere** scenario defined by the 1st Science Team meeting has been commanded: 13-16 March 2005 (15865-15909), 27-30 March 2005 (16066-16109).
- The **Upper Atmosphere** scenario defined by the 1st Science Team meeting has been commanded: 12-13 April 2005 (16294-16309).
- The **Upper Troposphere Lower Stratosphere 1** scenario defined by the 1st Science Team meeting has been commanded: 17-20 April (16366-16410).
- In-Flight calibrations **IF9** (25 April 2005, 16480-16483), **IF11** (25 April 2005, 16485) and **IF16** (25 April 2005, 16486-16487) have been commanded, trough DS, BB tables and segments recorded in the MPL_ORS_MP file.

RGT files already transferred to the FOCC:

AVI_UAV_TLVFOS20050208_121500_00000000_00000137_20050223_075308_20050226_073612.N1
AVI_UAV_TLVFOS20050208_145600_00000000_00000138_20050228_170734_20050301_093513.N1
AVI_UAV_TLVFOS20050208_150400_00000000_00000139_20050304_095918_20050331_120000.N1
AVI_UAV_TLVFOS20050217_140700_00000000_00000140_20050304_095918_20050305_071644.N1
AVI_UAV_TLVFOS20050217_142200_00000000_00000141_20050305_104208_20050307_080607.N1
AVI_UAV_TLVFOS20050217_143400_00000000_00000142_20050310_083012_20050312_065125.N1
AVI_UAV_TLVFOS20050217_144100_00000000_00000143_20050312_102221_20050331_120000.N1
AVI_UAV_TLVFOS20050308_161000_00000000_00000150_20050330_112240_20050402_073359.N1
AVI_UAV_TLVFOS20050308_161300_00000000_00000151_20050402_105833_20050404_082615.N1
AVI_UAV_TLVFOS20050308_162100_00000000_00000152_20050407_085019_20050430_120000.N1

AVI_UAV_TLVFOS20050314_165500_00000000_00000153_20050407_085019_20050409_071141.N1
AVI_UAV_TLVFOS20050314_170500_00000000_00000154_20050409_103835_20050412_091506.N1
AVI_UAV_TLVFOS20050314_171500_00000000_00000155_20050413_104225_20050416_065226.N1
AVI_UAV_TLVFOS20050314_172100_00000000_00000156_20050416_101843_20050430_120000.N1
AVI_UAV_TLVFOS20050323_142100_00000000_00000157_20050416_101843_20050417_095813.N1
AVI_UAV_TLVFOS20050323_143300_00000000_00000158_20050420_120254_20050423_063316.N1
AVI_UAV_TLVFOS20050323_144300_00000000_00000159_20050423_095904_20050531_120000.N1
AVI_UAV_TLVFOS20050407_161500_00000000_00000160_20050423_095904_20050425_090629.N1
AVI_UAV_TLVFOS20050407_162000_00000000_00000161_20050428_093034_20050430_061409.N1
AVI_UAV_TLVFOS20050407_163200_00000000_00000162_20050430_093935_20050531_120000.N1

MPL_ORS_MPVRGT20050208_131645_00000000_00000053_20050221_103157_20050228_102601.N1
Group_19330 RGTv_71
MPL_ORS_MPVRGT20050216_111859_00000000_00000054_20050301_115409_20050303_110506.N1
Group_19570 RGTv_74
MPL_ORS_MPVRGT20050217_135009_00000000_00000055_20050307_102503_20050309_111636.N1
Group_19630 RGTv_75
MPL_ORS_MPVRGT20050301_165030_00000000_00000058_20050328_110517_20050329_104751.N1
Group_20230 RGTv_78
MPL_ORS_MPVRGT20050307_164556_00000000_00000059_20050404_104510_20050406_095607.N1
Group_20355 RGTv_79
MPL_ORS_MPVRGT20050314_122410_00000000_00000060_20050412_113402_20050412_114813.N1
Group_20630 RGTv_80
MPL_ORS_MPVRGT20050323_141446_00000000_00000061_20050417_121709_20050419_094730.N1
Group_21031 RGTv_81
MPL_ORS_MPVRGT20050407_150507_00000000_00000062_20050425_162712_20050427_103621.N1
Group_21396 RGTv_83

MPL_CAL_MPVRGT20050207_160458_00000000_00000059_20050215_214759_20781231_235959.N1
Group_19290 RGTv_83 restart orbit #15500

MPL_LOS_MPVRGT20050216_134419_00000000_00000146_20050305_072144_20050306_100553.N1
Group_19590 RGTv_207
MPL_LOS_MPVRGT20050216_152611_00000000_00000147_20050312_065625_20050313_094607.N1
Group_19591 RGTv_208
MPL_LOS_MPVRGT20050307_165051_00000000_00000150_20050402_073859_20050403_102216.N1
Group_20354 RGTv_211
MPL_LOS_MPVRGT20050314_124038_00000000_00000151_20050409_071641_20050410_100219.N1
Group_20631 RGTv_212
MPL_LOS_MPVRGT20050314_131224_00000000_00000152_20050416_065726_20050417_094229.N1
Group_20632 RGTv_213
MPL_LOS_MPVRGT20050323_133413_00000000_00000153_20050423_063815_20050424_110328.N1
Group_21030 RGTv_214
MPL_LOS_MPVRGT20050407_101811_00000000_00000154_20050430_061909_20050501_104400.N1
Group_21370 RGTv_215

NOM scenario using floating altitudes (start orbit #15966 at ANX=1000 sec)
Group_20351
CTI_E02_MPVRGT20050307_154332_00000000_00000069_20050320_112236_20781231_235959.N1
CTI_E01_MPVRGT20050307_154332_00000000_00000069_20050320_112239_20781231_235959.N1
CTI_AST_MPVRGT20050307_154332_00000000_00000069_20050320_112242_20781231_235959.N1
CTI_N02_MPVRGT20050307_154332_00000000_00000035_20050320_112245_20781231_235959.N1
CTI_S08_MPVRGT20050307_154331_00000000_00000018_20050320_112248_20781231_235959.N1
CTI_NOC_MPVRGT20050307_154332_00000000_00000069_20050320_112251_20781231_235959.N1

Middle Atmosphere scenario (start orbit #16066 at ANX=1000 sec)

Group_20352

CTI_E02_MPVRGT20050307_155058_00000000_00000070_20050327_110229_20781231_235959.N1
CTI_E01_MPVRGT20050307_155058_00000000_00000070_20050327_110232_20781231_235959.N1
CTI_AST_MPVRGT20050307_155058_00000000_00000070_20050327_110235_20781231_235959.N1
CTI_N01_MPVRGT20050307_155058_00000000_00000035_20050327_110238_20781231_235959.N1
CTI_S02_MPVRGT20050307_155057_00000000_00000019_20050327_110241_20781231_235959.N1
CTI_NOC_MPVRGT20050307_155058_00000000_00000070_20050327_110244_20781231_235959.N1

NOM scenario using floating altitudes (start orbit #16179 at ANX=1000 sec)

Group_20353

CTI_E02_MPVRGT20050307_162325_00000000_00000071_20050404_083009_20781231_235959.N1
CTI_E01_MPVRGT20050307_162324_00000000_00000071_20050404_083012_20781231_235959.N1
CTI_AST_MPVRGT20050307_162325_00000000_00000071_20050404_083015_20781231_235959.N1
CTI_N02_MPVRGT20050307_162324_00000000_00000036_20050404_083018_20781231_235959.N1
CTI_S04_MPVRGT20050307_162324_00000000_00000018_20050404_083021_20781231_235959.N1
CTI_NOC_MPVRGT20050307_162324_00000000_00000071_20050404_083024_20781231_235959.N1

Upper Atmosphere scenario (start orbit #16294 at ANX=1000 sec)

Group_20650

CTI_E02_MPVRGT20050314_155657_00000000_00000072_20050412_091900_20781231_235959.N1
CTI_E01_MPVRGT20050314_155656_00000000_00000072_20050412_091903_20781231_235959.N1
CTI_AST_MPVRGT20050314_155657_00000000_00000072_20050412_091906_20781231_235959.N1
CTI_N01_MPVRGT20050314_155656_00000000_00000036_20050412_091909_20781231_235959.N1
CTI_S06_MPVRGT20050314_155656_00000000_00000017_20050412_091912_20781231_235959.N1
CTI_NOC_MPVRGT20050314_155656_00000000_00000072_20050412_091915_20781231_235959.N1

Upper Troposphere Lower Stratosphere 1 scenario (start orbit #16366 at ANX=1000 sec)

Group_21032

CTI_E02_MPVRGT20050323_142818_00000000_00000073_20050417_100207_20781231_235959.N1
CTI_E01_MPVRGT20050323_142818_00000000_00000073_20050417_100210_20781231_235959.N1
CTI_AST_MPVRGT20050323_142818_00000000_00000073_20050417_100213_20781231_235959.N1
CTI_N02_MPVRGT20050323_142818_00000000_00000037_20050417_100216_20781231_235959.N1
CTI_S08_MPVRGT20050323_142818_00000000_00000019_20050417_100219_20781231_235959.N1
CTI_NOC_MPVRGT20050323_142818_00000000_00000073_20050417_100222_20781231_235959.N1

IF9 – Offset Tangent Height Determination (start orbit #16480 at ANX=1000 sec)

Group_21373

CTI_E02_MPVRGT20050407_111152_00000000_00000074_20050425_091023_20781231_235959.N1
CTI_E01_MPVRGT20050407_111152_00000000_00000074_20050425_091026_20781231_235959.N1
CTI_AST_MPVRGT20050407_111152_00000000_00000074_20050425_091029_20781231_235959.N1
CTI_N01_MPVRGT20050407_111152_00000000_00000037_20050425_091032_20781231_235959.N1
CTI_S02_MPVRGT20050407_111152_00000000_00000020_20050425_091035_20781231_235959.N1
CTI_NOC_MPVRGT20050407_111152_00000000_00000074_20050425_091038_20781231_235959.N1

NOM scenario using floating altitudes (start orbit #16483 at ANX=1500 sec)

Group_21374

CTI_E02_MPVRGT20050407_114127_00000000_00000075_20050425_142031_20781231_235959.N1
CTI_E01_MPVRGT20050407_114127_00000000_00000075_20050425_142034_20781231_235959.N1
CTI_AST_MPVRGT20050407_114127_00000000_00000075_20050425_142037_20781231_235959.N1
CTI_N02_MPVRGT20050407_114127_00000000_00000038_20050425_142040_20781231_235959.N1
CTI_S04_MPVRGT20050407_114127_00000000_00000019_20050425_142043_20781231_235959.N1
CTI_NOC_MPVRGT20050407_114127_00000000_00000075_20050425_142046_20781231_235959.N1

IF11 – Absence of High Resolution Features Verification in Gain (orbit #16485)

CTI_DSN_MPVRGT20050407_122458_00000000_00000132_20050425_173108_20781231_235959.N1
Group_21390 RGTv_150 set tables
CTI_BBN_MPVRGT20050407_122820_00000000_00000079_20050425_173248_20781231_235959.N1
Group_21391 RGTv_96

IF16 – Limb Scanning Sequences in Raw Data Mode (orbits #16486-16487)

CTI_DSN_MPVRGT20050407_123148_00000000_00000133_20050425_190504_20781231_235959.N1
Group_21392 RGTv_151 set tables
CTI_BBN_MPVRGT20050407_123413_00000000_00000080_20050425_190644_20781231_235959.N1
Group_21393 RGTv_97
CTI_DSN_MPVRGT20050407_142725_00000000_00000134_20050425_193144_20781231_235959.N1
Group_21394 RGTv_152 re-set tables
CTI_BBN_MPVRGT20050407_143026_00000000_00000081_20050425_193324_20781231_235959.N1
Group_21395 RGTv_98

Table 4 summarizes the status of special measurements done in March and April 2005.

Tab. 4 Status of the MIPAS special and in-flight calibration measurements done in March and April 2005.

Measurement	Date	Orbit	Execution
IF_9	25 April 2005	16480-16483	Missing interval for PDS unknown failure: Orbits 16480-16482 Time 09:11:29 - 12:23:50
IF_11	25 April 2005	16485	Successful
IF_16	25 April 2005	16486-16487	Not Processed
MA	13-16 March 2005	15865–15909	Missing interval for PDS unknown failure: Orbits 15865-15867 Time 13 March 2005 10:03:13 - 13:32:43 Missing interval for instrument unavailability Orbits 15886-15909 Time 14 March 2005 21:06:51 - 16 March 2005 11:57:54
MA	27–30 March 2005	16066-16109	Missing interval for instrument unavailability Orbits 16075-16076 Time 28 March 200502:24:26- 03:40:22 Missing interval for PDS unknown failure: Orbit 16076 Time 28 March 2005 03:40:22 - 03:40:37
UA	12-13 April 2005	16294-16309	Missing interval for PDS unknown

			failure: Orbits 16299-16300 Time 12 April 2005 17:44:09-19:23:48
UTLS-1	17-20 April 2005	16366-16410	Successful

2.3.2 THERMAL PERFORMANCE

The bi-monthly instrument thermal trend (Fig. 1, 2 and 3) is characterized by an evident drift, clearly visible also in the long-term instrument thermal trend (Fig. 4, 5 and 6).

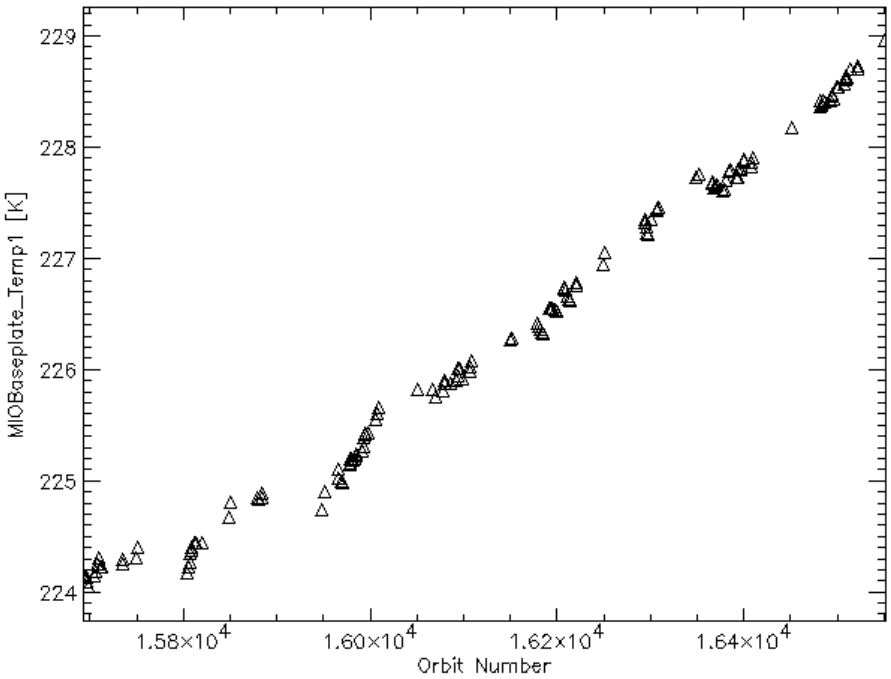


Fig. 1 Bi-monthly trend of MIO Base-plate Temperature #1 (each point represents the orbit mean value): March - April 2005.

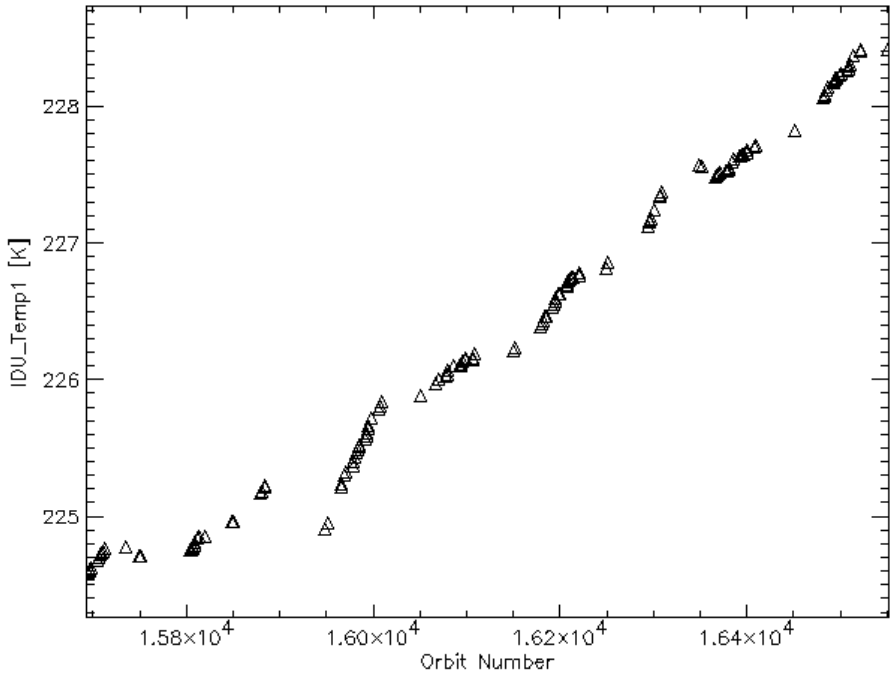


Fig. 2 Bi-monthly trend of IDU Temperature #1 (each point represents the orbit mean value): March - April 2005.

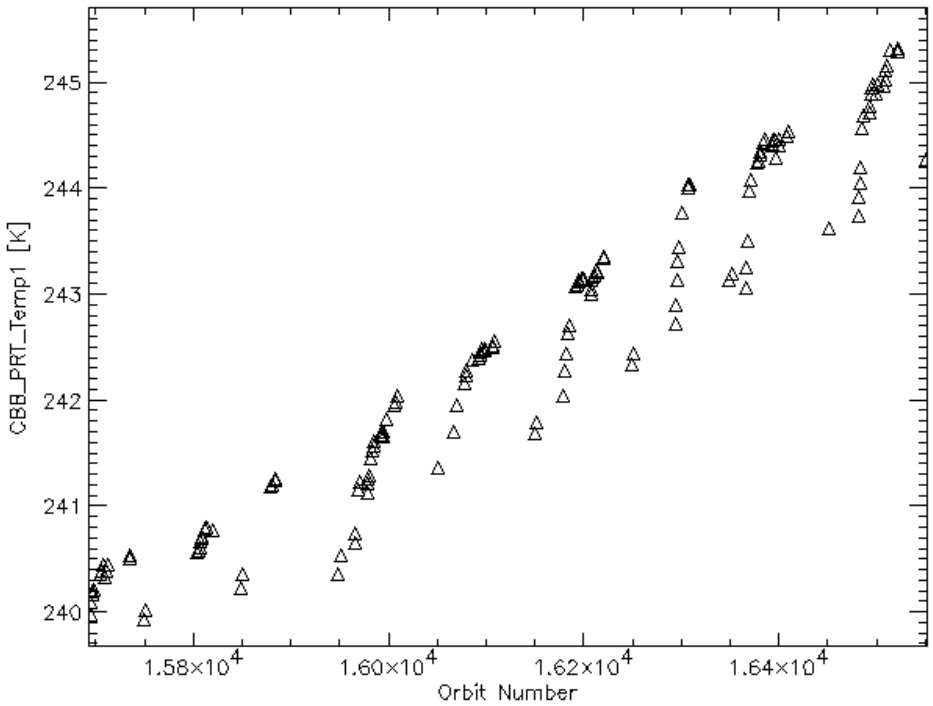


Fig. 3 Bi-monthly trend of CBB_PRT Temperature #1 (each point represents the orbit mean value): March - April 2005.

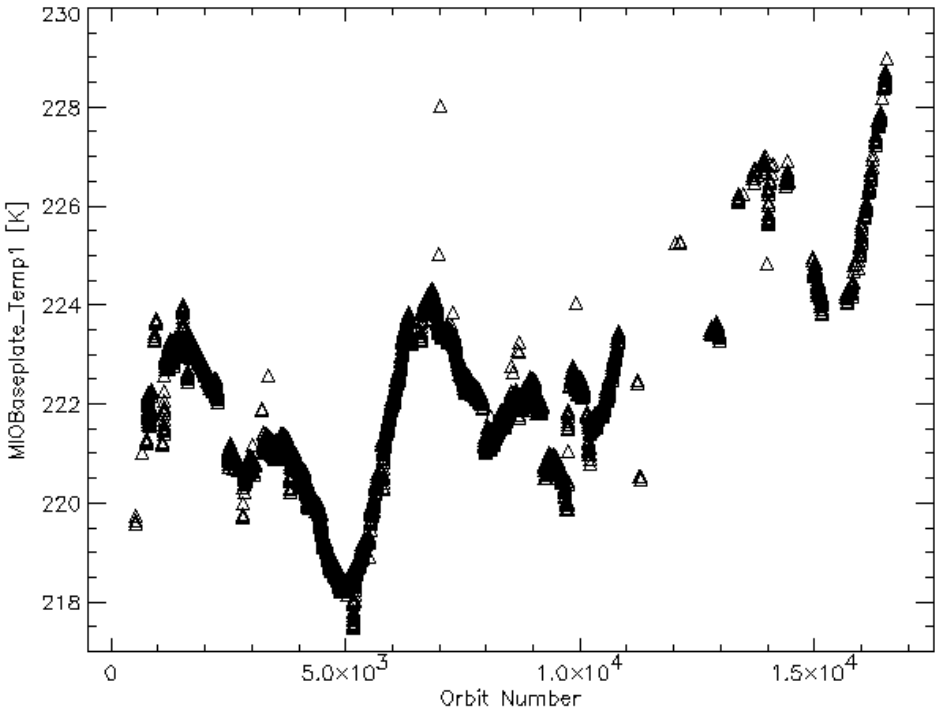


Fig. 4 Long-term trend of MIO Base-plate Temperature #1 (each point represents the orbit mean value): April 2002 - April 2005.

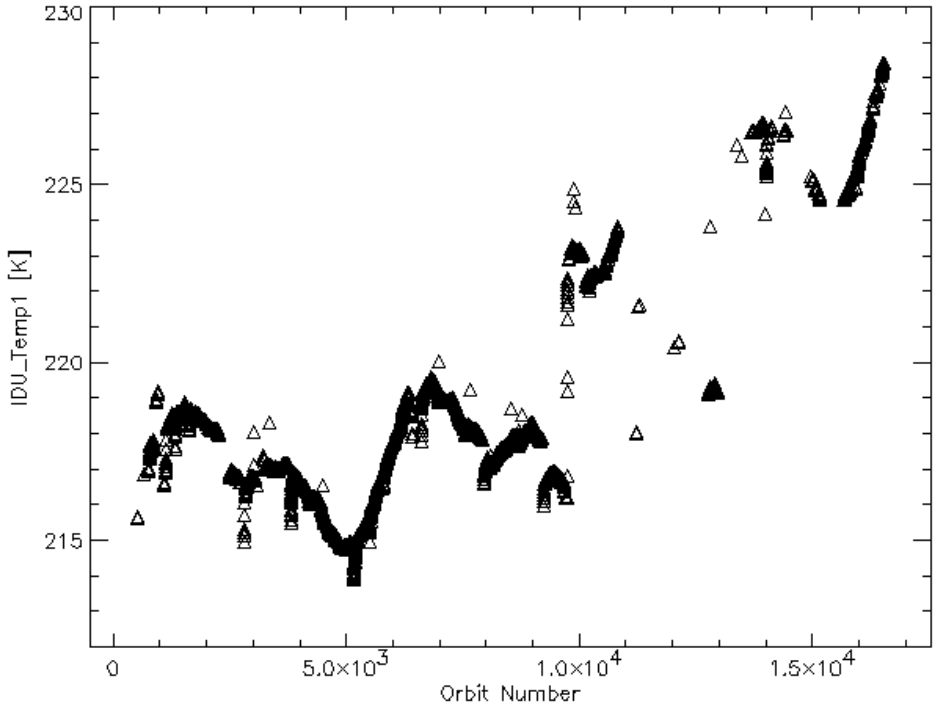


Fig. 5 Long-term trend of IDU Temperature #1 (each point represents the orbit mean value): April 2002 - April 2005.

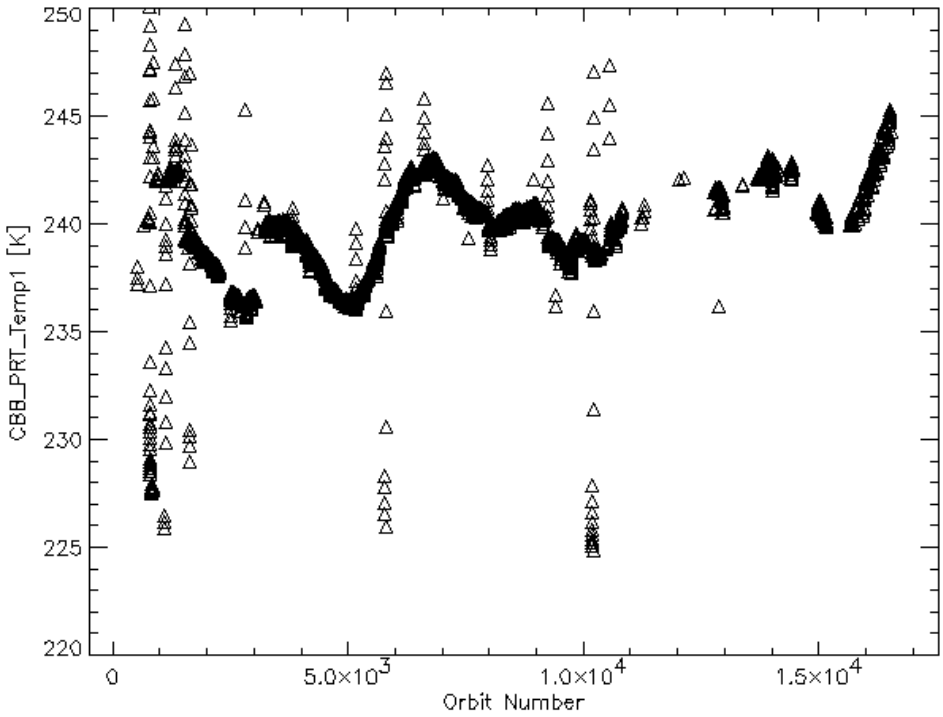


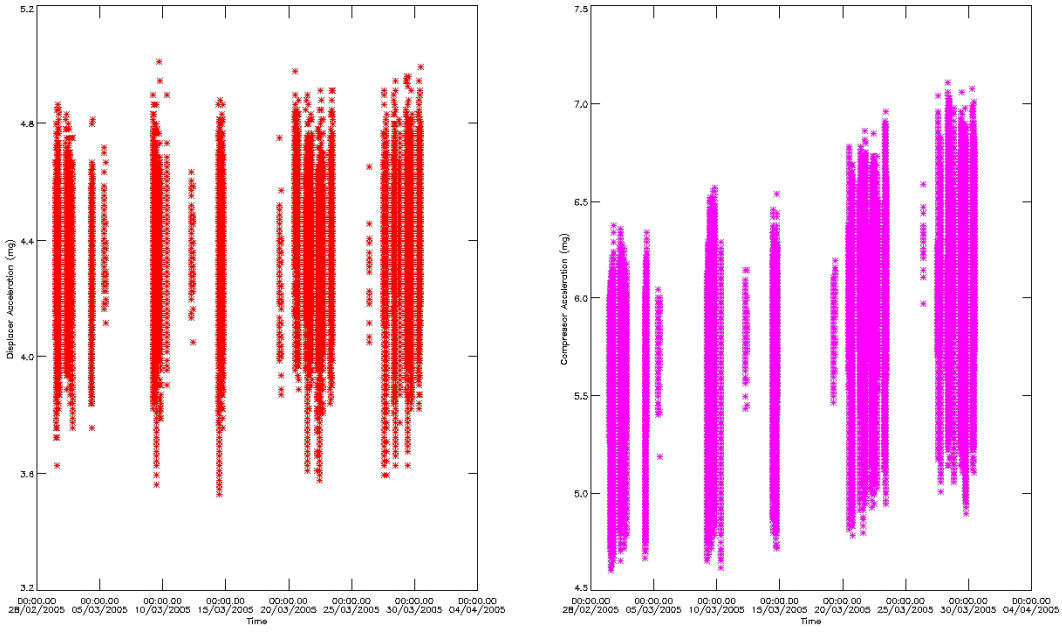
Fig. 6 Long-term trend of CBB_PRT Temperature #1 (each point represents the orbit mean value): April 2002 - April 2005.

We are investigating whether the behaviour is nominal (seasonal trend) or related to an anomalous increase of instrument temperature.

2.3.3 MECHANICAL PERFORMANCE

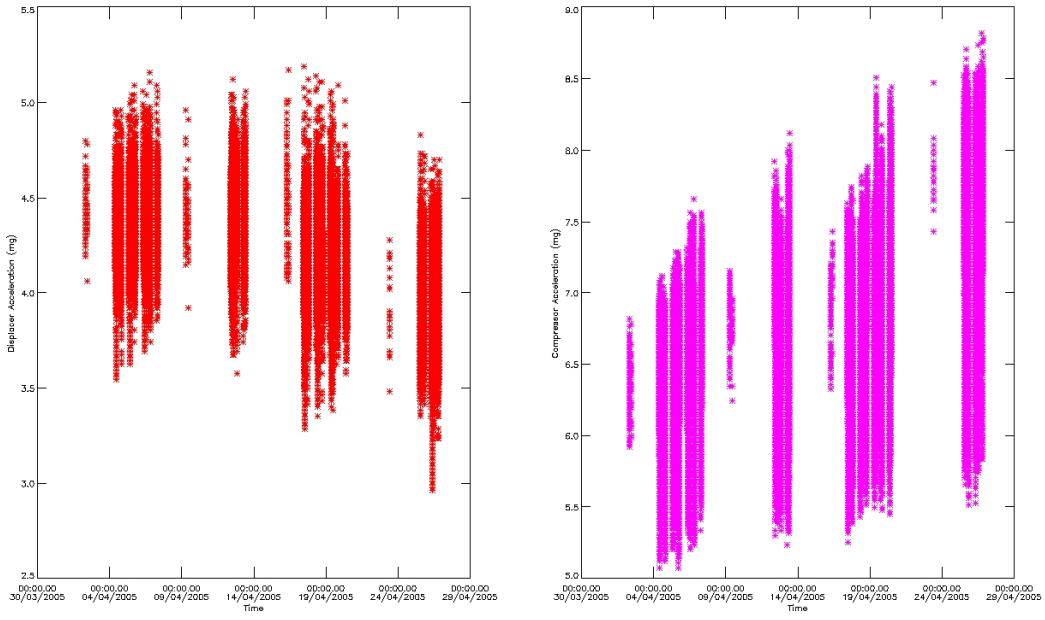
2.3.3.1 Cooler Performance

The Compressor and Displacer vibration level are monitored on a daily basis. The monitoring foresees a warning message whenever the Compressor vibration level exceeds a threshold value (8 mg) well below the tolerance error that activates the MIPAS Standby/Refuse mode. During March and April 2005 an evident increase in Compressor vibration level has been observed (see Fig. 7 and 8) and starting from second part of April 2005 the warning threshold has been exceeded many times.



(a) (b)

Fig. 7 March 2005: (a) Displacer and (b) Compressor vibration level.



(a) (b)

Fig. 8 April 2005: (a) Displacer and (b) Compressor vibration level.

After an analysis done by Astrium, it has been found that the MIPAS cooler is not well balanced at the moment. On March, 16 MIPAS has been restarted after the last suspend. At this time both the compressors A and B were rebalanced by performing a compressor coarse balance. This balancing wasn't 100% perfect at that time so that the Compressor B runs with amplitude of 103.5 % of the amplitude applied to the compressor A at the moment. The values during characterizing the earlier periods were been always in the area of 102.6% and 103.2%. So the compressor isn't performing at its optimum at the moment. Additionally to that we are now in the warm period of the year causing a higher powering of the compressor. Now combined with the non-optimal adjustment at the moment the compressor A requires relatively high drive amplitude. Situation it's not highly critical at the moment. Nevertheless Astrium proposes to react as soon as possible performing a transition to Standby and back to Heater mode. This procedure will automatically re-set the compressor balance. According to mission planning, MIPAS will be in Heater mode from 07-May-2005 10:55:54 to 14-May-2005 07:20:13. I.e. no measurements, not even LOS are performed during that period. Therefore, the optimal time to perform the re-balance would be May, 9 or 10.

2.3.3.2 Interferometer Performance

Next bi-monthly report will contain a description of the interferometer performance.

2.4 Level 1 Product Quality Monitoring

2.4.1 PROCESSING CONFIGURATION

Figure 9 schematises the IPF updates, the resolution with which MIPAS has been operated, the activation and deactivation of the interferometer heaters and the dissemination of related ADFs. Currently the Near-Real Time (NRT) mission is suspended, and no systematic operational Off-Line (OFL) processing is performed as processing algorithms are being adapted to the new observation modes.

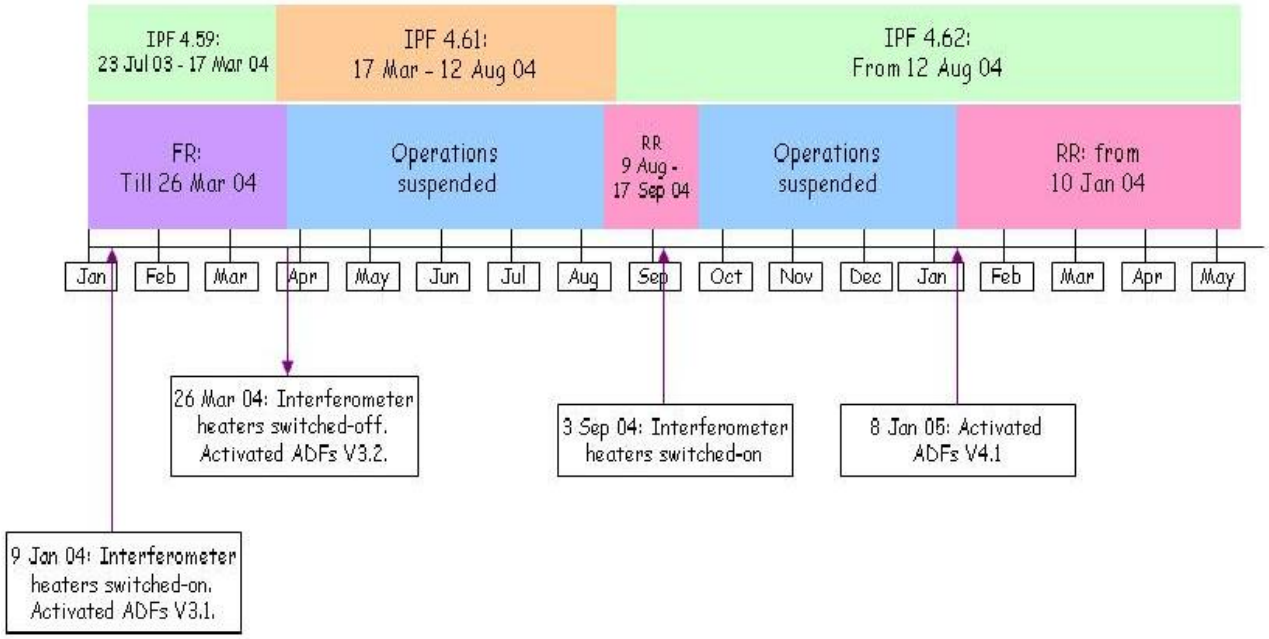


Fig. 4 Scheme for IPF update, interferometer heaters switch-on/off, resolution and ADFs version.

2.4.1.1 Processor Version

Table 5 lists the historical updates of the MIPAS processor:

- **Version V4.64** (aligned with DPM 4I and ADFs V4.1) will introduce variations only for Level 1 processor, with the following update:
  - Fixed internal SPR-121O0-2011: Problem with the block sequence (see review of Level 1 anomalies in Section 2.4.5.5).
- **Version V4.63** (aligned with DPM 4I and ADFs V4.1) will introduce variations for both Level 1 and Level 2 processor. For Level 1 processor, the following updates will be introduced:
  - Processing of low resolution measurements, with reduced resolution also for offset and gain data.
  - Solution of internal SPR-120O0-2000: Band D oscillations in forward sweeps for MIPAS reduced-resolution products (see review of Level 1 anomalies in Section 2.4.5.2).
  - Solution of internal SPR-120O0-2001: NESR data problem (see review of Level 1 anomalies in Section 2.4.5.4).
- **Version V4.62** (aligned with DPM 4H and ADFs V4.0) has introduced variations for both Level 1 and Level 2 processor. For Level 1 processor, the following updates have been introduced:
  - Processing of low resolution measurements, without reduced resolution for offset and gain data that will be implemented in IPF 4.63.

- Fixed NCR_1157: Bug in the MIPAS processor ILS retrieval.
- Fixed NCR_1259: Scans with null NESR.

- **Version V4.61** consists of updates for both Level 1 and Level 2:
  - Fixed NCR_1143: Sparse corruption of bands between 1 and 4 January 2004.
- **Version V4.59** has introduced only upgrade on Level 2 processor.
- **Version V4.57** involved only Level 1 processor update, introducing the following modifications:
  - Modification of FCE algorithm
  - Elimination of strong anomalous oscillations in the spectra
  - Modification of NESR reporting
  - ADC saturation flagging
  - Addition of aliasing spike suppression algorithm

Tab. 5 Historical updates of MIPAS processor at near real time (NRT) processing sites (PDHS-K and PDHS-E) and off-line processing sites (LRAC and D-PAC).

Centre	Facility Software	Date
DPAC	V4.62	12-08-2004
LRAC	V4.62	12-08-2004
PDHS-K	V4.62	12-08-2004
PDHS-E	V4.62	12-08-2004
DPAC	V4.61	15-03-2004
LRAC	V4.61	18-03-2004
PDHS-K	V4.61	17-03-2004
PDHS-E	V4.61	17-03-2004
LRAC	V4.59	20-08-2003
D-PAC	V4.59	06-08-2003
PDHS-K	V4.59	23-07-2003
PDHS-E	V4.59	23-07-2003
PDHS-K	V4.57	22-07-2003
LRAC	V4.57	22-07-2003
PDHS-K	V4.59	21-07-2003
LRAC	V4.59	21-07-2003
LRAC	V4.57	19-03-2003
PDHS-K	V4.57	18-03-2003
D-PAC	V4.57	05-03-2003
PDHS-E	V4.57	04-03-2003

2.4.1.2 Auxiliary Data Files

Table 6 lists the ADFs valid in March and April 2005: ADFs V4.1 is the set of auxiliary files for processing of data with IPF 4.63 and 4.64. A patch has been applied to mical for routine generation of MIP_CO1_AX, MIP_CG1_AX and MIP_CS1_AX suitable for processing with IPF 4.63 and IPF

4.64. Also received from Bomem, but not disseminated, ADFs V4.0 and V5.0 respectively for processing of 2RR measurements with IPF 4.62 and 1RR measurements with IPF 4.63.

Tab. 6 Level 1 ADFs valid in March and April 2005.

Auxiliary Data File	Start Validity	Stop Validity	Updated in March/April 2005
V4.1 MIP_CA1_AXVIEC20050315_102713_20050108_000000_20090108_000000 MIP_PS1_AXVIEC20050315_102931_20050108_000000_20090108_000000 MIP_MW1_AXVIEC20050315_102419_20050108_000000_20090108_000000	08-JAN-05	08-JAN-09	Yes
MIP_CL1_AXVIEC20050308_113825_20050108_000000_20090108_000000	08-JAN-05	08-JAN-09	Yes
MIP_CL1_AXVIEC20050420_152028_20050420_095747_20100420_095747	20-APR-05	20-APR-10	Yes
MIP_CS1_AXVIEC20050405_145644_20050301_000000_20090301_000000 MIP_CO1_AXVIEC20050405_145455_20050301_000000_20090301_000000 MIP_CG1_AXVIEC20050405_145110_20050301_000000_20090301_000000	01-MAR-05	01-MAR-09	Yes
MIP_CS1_AXVIEC20050406_071040_20050309_000000_20090309_000000 MIP_CO1_AXVIEC20050406_070925_20050309_000000_20090309_000000 MIP_CG1_AXVIEC20050406_070802_20050309_000000_20090309_000000	09-MAR-05	09-MAR-09	Yes
MIP_CS1_AXVIEC20050407_072532_20050314_000000_20090313_000000 MIP_CO1_AXVIEC20050407_072315_20050314_000000_20090313_000000 MIP_CG1_AXVIEC20050407_072135_20050314_000000_20090313_000000	14-MAR-05	13-MAR-09	Yes
MIP_CS1_AXVIEC20050407_143941_20050321_000000_20090321_000000 MIP_CO1_AXVIEC20050407_143827_20050321_000000_20090321_000000 MIP_CG1_AXVIEC20050407_143713_20050321_000000_20090321_000000	21-MAR-05	21-MAR-09	Yes
MIP_CS1_AXVIEC20050411_124023_20050328_000000_20090328_000000 MIP_CO1_AXVIEC20050411_123853_20050328_000000_20090328_000000 MIP_CG1_AXVIEC20050411_123723_20050328_000000_20090328_000000	28-MAR-05	28-MAR-09	Yes
MIP_CS1_AXVIEC20050412_073232_20050404_000000_20090404_000000 MIP_CO1_AXVIEC20050412_073044_20050404_000000_20090404_000000 MIP_CG1_AXVIEC20050412_072926_20050404_000000_20090404_000000	04-APR-05	04-APR-09	Yes
MIP_CS1_AXVIEC20050415_073947_20050412_193338_20100412_193338 MIP_CO1_AXVIEC20050415_073723_20050412_235725_20100412_235725 MIP_CG1_AXVIEC20050415_073538_20050412_231018_20100412_231018	12-APR-05	12-APR-10	Yes
MIP_CS1_AXVIEC20050421_065830_20050420_123922_20100420_123922 MIP_CO1_AXVIEC20050421_065720_20050420_141654_20100420_141654 MIP_CG1_AXVIEC20050421_065554_20050420_133450_20100420_133450	20-APR-05	20-APR-10	Yes
MIP_CS1_AXVIEC20050427_151520_20050426_214921_20100426_214921 MIP_CO1_AXVIEC20050427_150029_20050426_234259_20100426_234259 MIP_CG1_AXVIEC20050427_150526_20050426_225532_20100426_225532	26-APR-05	26-APR-10	Yes

The strategy for the ADFs update is the following one:

- The MIP_CO1_AX, MIP_CG1_AX and MIP_CS1_AX are updated every week and after a long cooler switch-off.
- The MIP_CL1_AX is analysed every two weeks and updated when the pointing error differs with respect to the last disseminated one more than 8 mdeg.
- The MIP_PS1_AX is updated every time there are setting updates: per example when the interferometer heaters are switched-on/off it is needed to adjust the noise threshold.
- The MIP_MW1_AX is updated when the micro-window are changed.

2.4.2 SPECTRAL PERFORMANCE

Dissemination of MIPAS calibration files (MIP_CG1_AX, MIP_CO1_AX and MIP_CS1_AX) has been done on a weekly basis during the period March-April 2005. Among them, the spectral calibration file MIP_CS1_AX contains the spectral correction factor (SCF), which compensate for instrument metrology variation e.g., aging of laser. Figure 10 below gives the variation trend over the period. We observe a very stable situation.

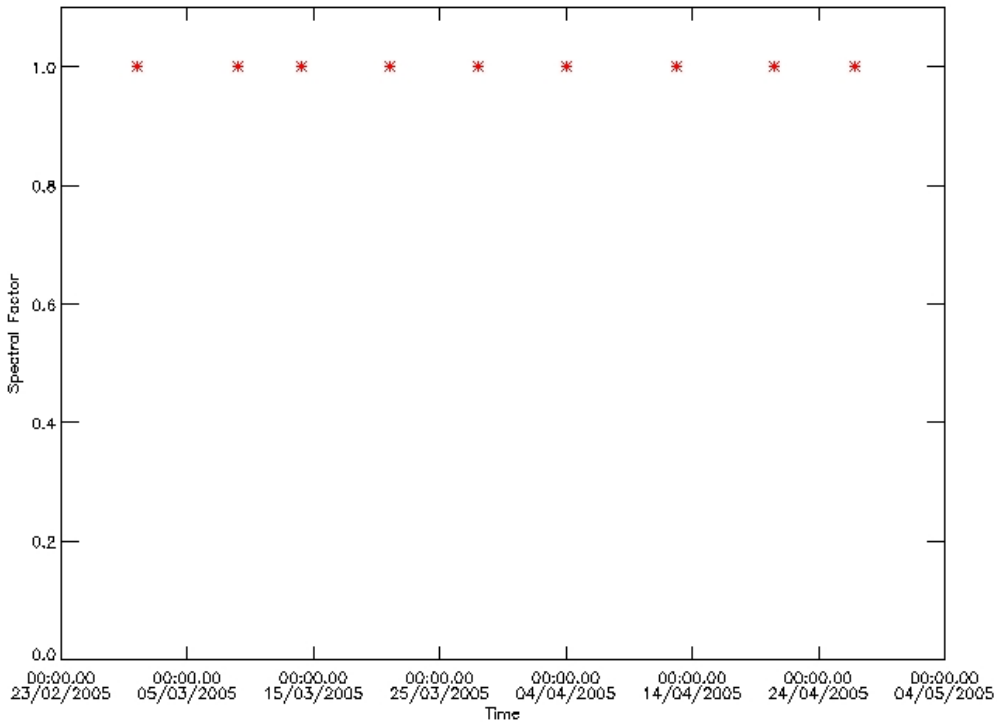


Fig. 10 MIPAS Spectral Calibration Factor (SCF) variation over March-April 2005.

2.4.3 RADIOMETRIC PERFORMANCE

Figure 11 shows the relative variation of radiometric gain during the period January-April 2005. As clearly visible, an evident drift characterizes the gain increasing (3.5% per week during last 2 weeks). It is still under investigation whether this is caused either by the ice contamination affecting MIPAS detectors or by a new anomaly.

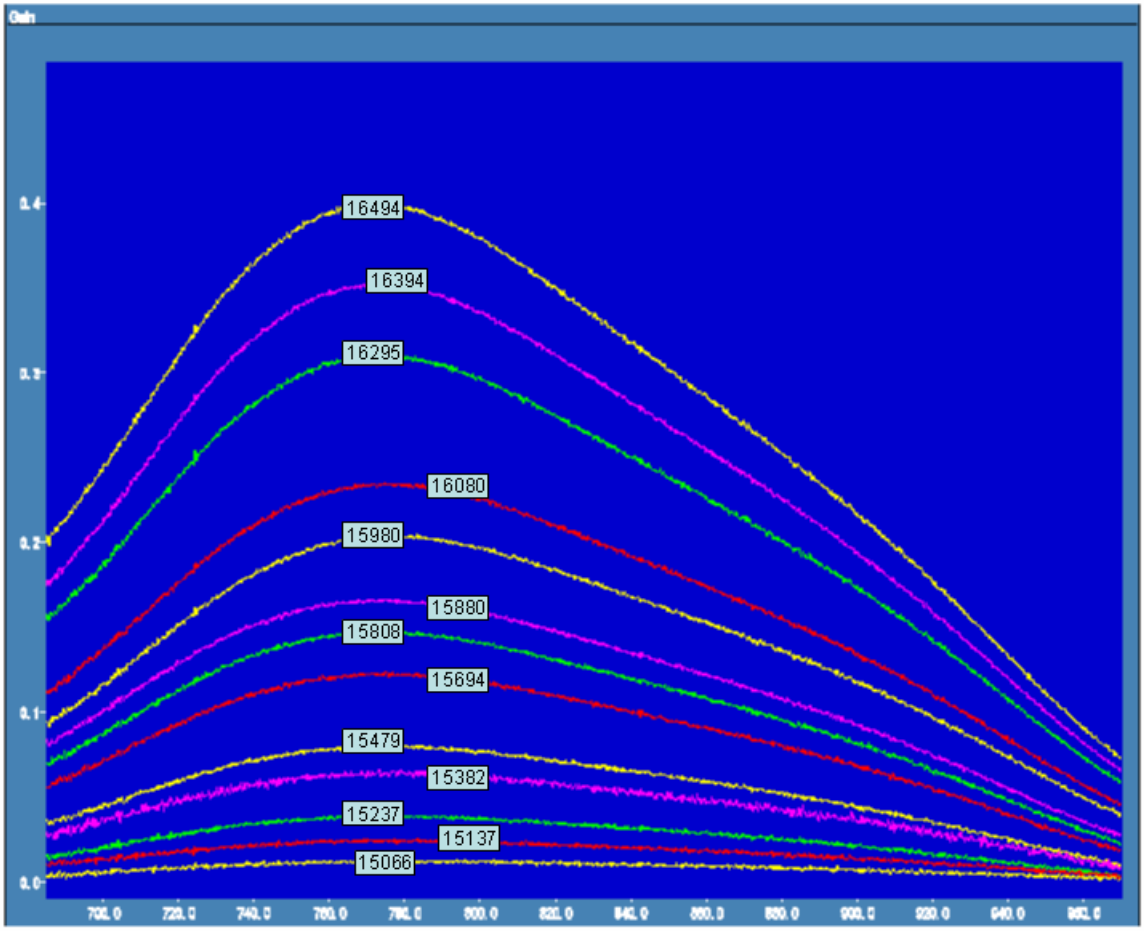


Fig. 11 Relative variation of radiometric gain ((abs(wi)-abs(w0))/abs(w0), w0 gain for reference orbit 14994) for band A.

2.4.4 POINTING PERFORMANCE

The LOS calibration measurements are performed every week. This configuration allows the analysis of the pointing stability and guaranties the availability of the data in case of missing products. Initial analysis has evidenced a marked annual cycle (as shown in Fig. 12) covering the period September 2002 – April 2005. The figure shows the relative and the absolute (evaluated taking into account the commanded elevation angle for the LOS calibration) pointing error. That annual trend is not due to the MIPAS instrument itself, but to a mispointing of the entire ENVISAT satellite resulting from software response to orbit control information. In fact, the update in the platform pointing software implemented on 12 December 2003 (orbit 9321) has evidently reduced the pointing deviation trends (see last points in Fig. 12).

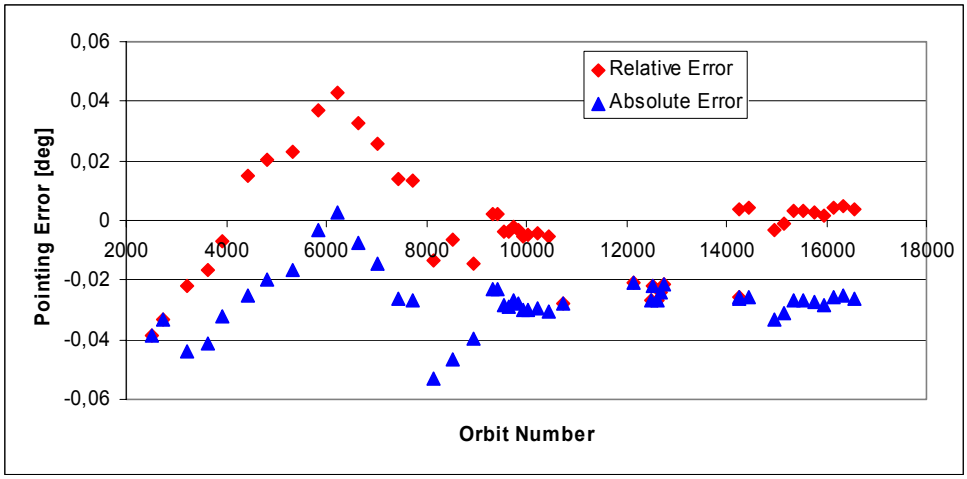


Fig. 12 MIPAS pointing error as a function of the orbit number: September 2002- April 2005.

As it can be seen in Fig. 12, there are points were relative and absolute errors are coincident because the angle for LOS measurements has been commanded to 0 mdeg. Table 7 shows the history of the commanded angle for LOS measurements.

Tab. 7 LOS commanded angle updates.

Start Date	Start Orbit	Stop Date	Stop Orbit	Angle [mdeg]
beginning	/	28 Sep 2002	3024	0
05 Oct 2002	3123	26 Oct 2002	3424	- 22
02 Nov 2002	3524	30 Nov 2002	3926	- 25
07 Dec 2002	4025	01 Nov 2003	8738	- 40
08 Nov 2003	8835	08 Nov 2003	8836	- 25
10 Nov 2003	8864	10 Nov 2003	8865	0
15 Nov 2003	8934	6 Mar 2004	10538	- 25
13 Mar 2004	10639	20 Nov 2004	14250	0
21 Nov 2004	14265	/	/	- 30

Starting from the second part of September 2003, only measurements from channel D2 are processed because of the increased noise affecting channel D1. In order to reduce that noise, from 21 November 2004 (orbit 14265), the planning strategy for LOS measurements has been changed and the number of observations per star has been doubled.

During the anomaly investigation in winter 2005, the absence of interferometer operations has been used for a dedicated Line of Sight campaign. MIPAS LOS data have been inter-compared with restituted attitude information from the Envisat star trackers, in preparation of future operational use of restituted attitude in off-line processing. Figure 13 presents results from July 29th, 2004. Note that a bias of 24 mdeg was subtracted from pointing error. Apart from this bias, results from MIPAS LOS campaign agree with star tracker information. Investigations are currently ongoing to find the cause of this bias.

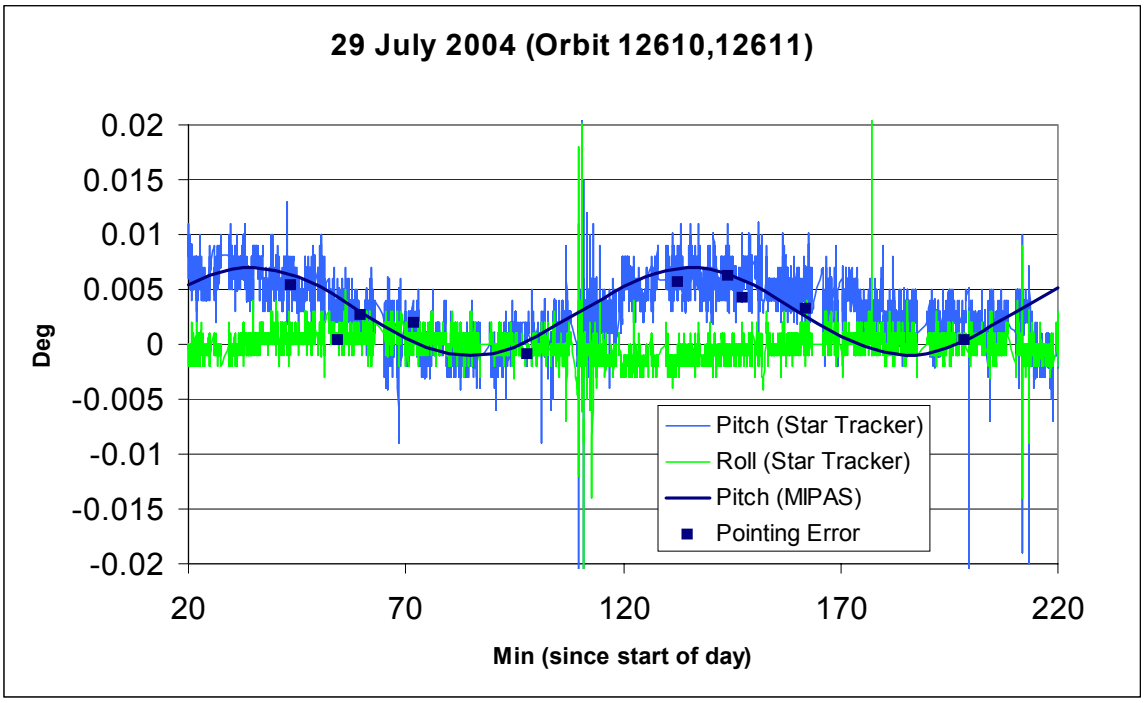


Fig. 13 Comparison between MIPAS pointing and star tracker information.

2.4.5 ANOMALY STATUS

Table 8 summarises the anomalies affecting Level 1 products and shows the associated SPR, NCR, AR and HD code.

Tab. 8 Level 1 anomaly list.

Anomaly	Prototype/DPM SPR	IPF NCR	AR	HD
S6 corrupted sweeps	/	/	/	HD/07-2004/705
Oscillations in band D	/	Internal SPR – 120O0-2000	1690	HD/12-2004/749
Number of sweeps per scan	/	/	/	HD/01-2005/1010
Corrupt points in NESR data	/	Internal SPR – 120O0-2001	/	HD/01-2005/1011
Problem with the block sequence	/	Internal SPR-121O0-2011 connected to NCR_969	/	/

2.4.5.1 S6 Corrupted Sweeps

The S6 level 1b data from July 2003 have a large number of corrupted sweeps. In general, not all bands are corrupted. The problem has been traced to the NESR threshold that gives different level of rejection depending on the resolution. The July 2003 products have been reprocessed with a modified MIP_PS1_AX that takes into account the reduced resolution of S6 measurements.

2.4.5.2 Oscillations in Band D

August 2004 products, generated with IPF 4.62, have shown oscillating spectra in forward sweeps of band D. Comparison with prototype data has shown that this anomaly is due to an implementation error in the IPF 4.62. IPF 4.63 has fixed this error.

2.4.5.3 Number of Sweeps per Scan

The affected product is orbit 12963 generated with IPF 4.62. SPH gives: "NUM_SWEEPS_PER_SCAN=+00018", but 17 is the correct value (although the last scan has 18 sweeps). The problem has been investigated by Bomem and it has been found that the auxiliary data block is missing in the last sweep of the orbit, so detection of beginning/end of scan can't be done. The prototype is not affected by the problem because Bomem has solved this particular problem by rejecting last sweep when its auxiliary data block is missing. This specific case is not documented in the DPM and an SPR will be raised.

2.4.5.4 Corrupt Points in NESR Data

Affected products are orbits 12877 (scan #119) and 12965 (scan #62) generated with IPF 4.62. NESR data appear to include some corrupt points. This anomaly has been traced down to an implementation error, and it has been fixed in IPF 4.63.

2.4.5.5 Problem with the Block Sequence

Because of an incorrect detection of corrupted/missing ISP, IPF 4.63 failed some product generation. The problem has been fixed in IPF 4.64.

2.4.6 RE-PROCESSING STATUS

Figure 14 shows the reprocessing status at the end of April 2005. L0 Expected field takes into account all instrument and product generation unavailability, so it describes what it's actually expected. The discrepancy between expected and received is caused by a delay in the generation of consolidated Level 0 at LRAC.

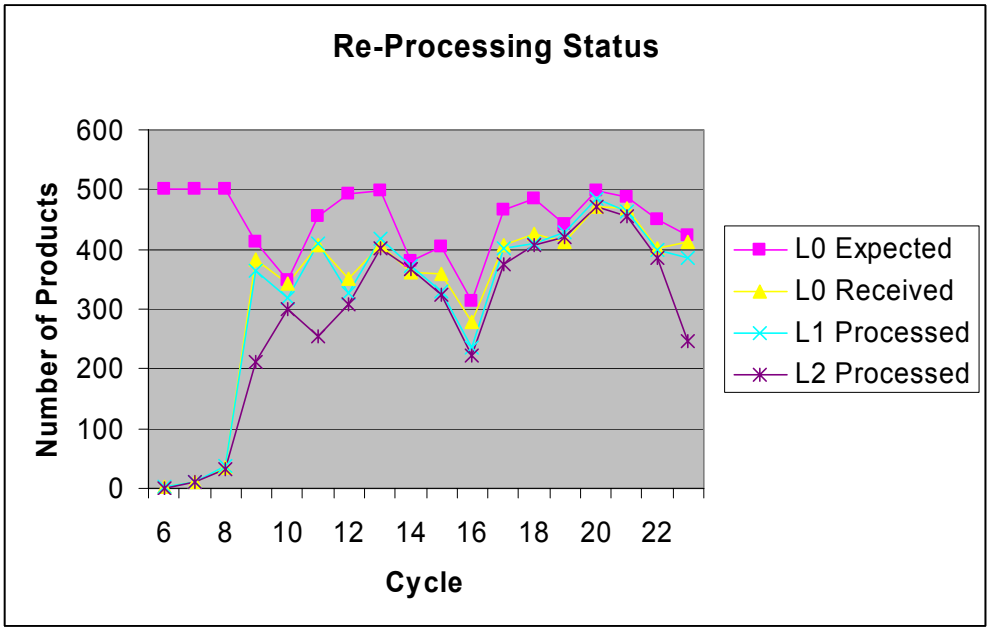


Fig. 14 Re-processing status at the end of April 2005

2.4.7 OTHER RESULTS

As said before, no NRT product generation is foreseen for now. For Science team and for QWG, the following products have been generated using migsp prototype:

MA
MIP_NL__1PPLRA20050111_014126_000060332033_00404_14987_0765.N1

UTLS-1
MIP_NL__1PPLRA20050117_115639_000060122033_00496_15079_0824.N1

UA
MIP_NL__1PPLRA20050121_113027_000060312034_00052_15136_0855.N1

UTLS-2
MIP_NL__1PPLRA20050123_120742_000060732034_00081_15165_0874.N1

Nominal Measurements (2RR, 27 sweeps per scan) with fixed altitude
MIP_NL__1PPLRA20050128_125114_000060542034_00153_15237_0908.N1
MIP_NL__1PPLRA20050128_143210_000060212034_00154_15238_0909.N1
MIP_NL__1PPLRA20050128_161233_000060212034_00155_15239_0910.N1

Nominal Measurements (2RR, 27 sweeps per scan) with floating altitude
MIP_NL__1PNPDK20050301_113042_000060482035_00109_15694_0774.N1
MIP_NL__1PNPDK20050301_131032_000059792035_00110_15695_0766.N1

July 2003 S6 reprocessing

MIP_NL__1PNPDK20030704_121645_000060262017_00453_07020_0120.N1
MIP_NL__1PNPDK20030704_135638_000059212017_00454_07021_0127.N1
MIP_NL__1PNPDK20030704_153445_000058952017_00455_07022_0122.N1
MIP_NL__1PNPDK20030704_171226_000058622017_00456_07023_0123.N1
MIP_NL__1PNPDK20030704_184910_000061052017_00457_07024_0124.N1
MIP_NL__1PNPDK20030704_202907_000062392017_00458_07025_0125.N1
MIP_NL__1PNPDK20030705_050206_000045322017_00463_07030_0133.N1
MIP_NL__1PNPDK20030705_093800_000017672017_00466_07033_0134.N1

2.5 Level 2 Product Quality Monitoring

2.5.1 PROCESSOR CONFIGURATION

Figure 15 schematises the IPF updates, the resolution with which MIPAS has been operated, the activation and deactivation of the interferometer heaters and the dissemination of related ADFs.

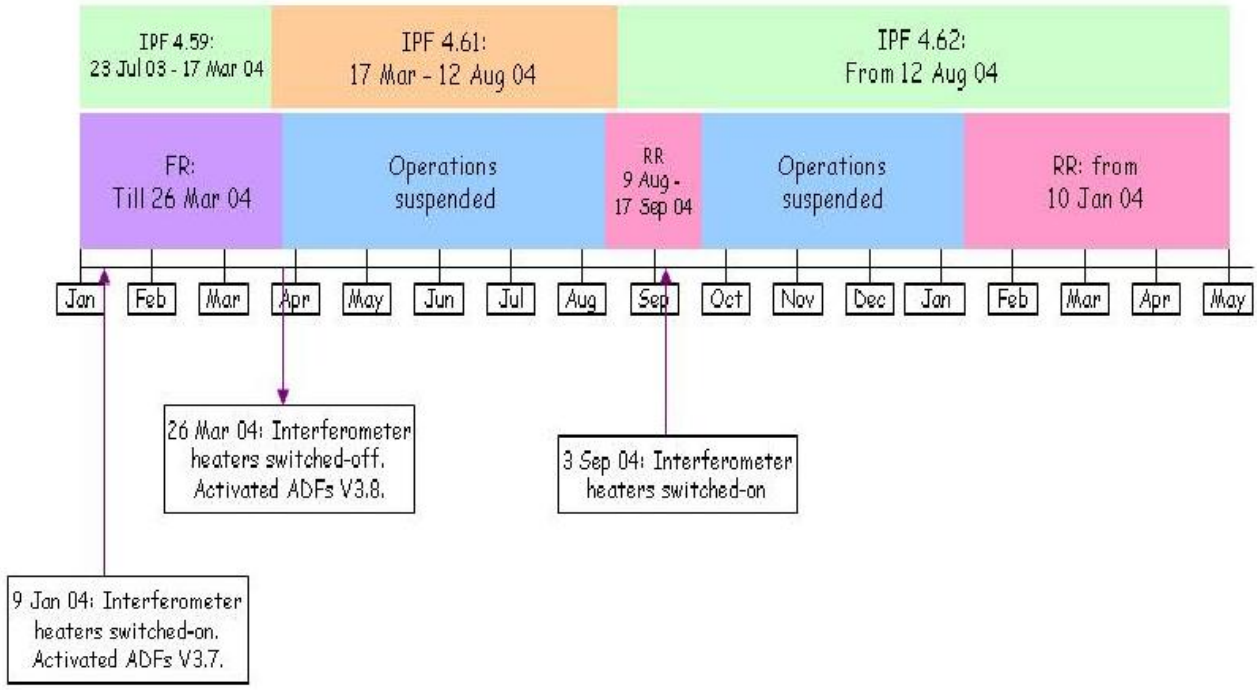


Fig. 15 Scheme for IPF update, interferometer heaters switch-on/off, resolution and ADFs version.

2.5.1.1 Version

As already explained in Section 2.4.1.1, Tab. 6 lists the historical updates of the MIPAS processor:

- **Version V4.63** (aligned with DPM 4.1) will introduce the following modifications:
  - Processing of reduced resolution measurements in old configuration (17 sweeps per scan and fixed altitude – August/September 2004 measurements).
  - Solution of NCR_1278: Some MIPAS profiles have zero pressure (see review of Level 2 anomaly in Section 2.5.2.2).
  - Solution of NCR_1308: MIPAS Level 2 failure.
  - Rejection of NCR_1310: Problem with MIPNL__2P (see review of Level 2 anomaly in Section 2.5.2.4).
  - Rejection of NCR_1317: One second discrepancy in IPF 4.61 (see review of Level 2 anomaly in Section 2.5.2.3).
- **Version V4.62** (aligned with DPM 4.0) has solved the following problems:
  - Fixed NCR_1128: Cloud-detection anomaly.
  - Fixed NCR_1275: Inconsistent values in MIPAS files.
  - Fixed NCR_1276: Level2 profile counting bug.
- **Version V4.60** has solved the following problems:
  - Fixed NCR_992: Inconsistency in number of profiles in MIPAS Level_2.
  - Fixed NCR_1068: Number of computed residual spectra not consistent with the number of observations.
- **Version V4.59**, operational since 23 July 2003, has introduced only Level 2 processing variations. The main improvements introduced via both the processor V4.59 and the installation of a new set of ADFs, have been:
  - Fixed NCR_892: Inconsistency in number of scans.
  - Fixed NCR_893: Different values for same scans.
  - The cloud filtering (that is, every time a cloud is detected at a given altitude, the retrieval is performed only above that altitude)
  - The removal of the gaps between the altitude validity ranges (allowing retrievals in the Antarctic region not feasible with the old MIP_MW2_AX)
  - Altitudes margins fixed to +/- 4 km
  - MIPAS-SPR-MAINT-0011 Wrong DSD name in L2 product in case of not requested VMR
  - MIPAS-SPR-MAINT-0012 Filling of SPH field 22 of MIPAS Level 2 ProductsMIPAS-SPR-MAINT-0013 Filling of the MIPAS MPH and MIPAS Level 2 SPH fields
  - MIPAS-SPR-MAINT-0014 Wrong writing of PCD String to the PCD Information ADS
  - MIPAS-SPR-MAINT-0015 Too strong test and skipping retrieval
  - MIPAS-SPR-MAINT-0016 Not initialised nucl1 and nucl2 in R 8.5.6.3-7A
  - ENVI-GSOP-EOAD-NC-03-0539 MIPAS L2 processing aborted

2.5.1.2 Auxiliary Data Files

Table 9 shows the historical dissemination (from January 2003) of Level 2 ADFs till the mission interruption occurred in March 2004. The ADFs have not been updated since the mission interruption.

Tab. 9 Historical update of Level 2 ADFs.

Auxiliary Data File	Start Validity	Description
ADFs V3.1: MIP_MW2_AXVIEC20030722_134301_20030723_000000_20080722_000000 MIP_OM2_AXVIEC20030722_134602_20030723_000000_20080722_000000 MIP_PS2_AXVIEC20030722_102142_20030723_000000_20080722_000000 MIP_PI2_AXVIEC20030722_134848_20030723_000000_20080722_000000 MIP_CS2_AXVIEC20030722_133331_20030723_000000_20080722_000000 MIP_SP2_AXVIEC20030722_093046_20030723_000000_20080722_000000	23-JUL-03	Cloud detection enabled and improved validity mask range in Microwindows files; improved Occupation Matrices (no gaps between altitude validity ranges).
MIP_IG2_AXVIEC20030214_130918_20030301_000000_20080301_000000	01-MAR-03	Seasonal update of climatological initial guess: This auxiliary file turned out to be corrupt, and a corrected version has been disseminated on 10 March 2003.
MIP_IG2_AXVIEC20030307_142141_20030310_000000_20080301_000000	10-MAR-03	Seasonal update of climatological initial guess: This dissemination substitute the corrupt file disseminated previously.
MIP_IG2_AXVIEC20030522_104714_20030601_000000_20080601_000000	01-JUN-03	Seasonal update of climatological initial guess.
MIP_IG2_AXVIEC20030731_134035_20030901_000000_20080901_000000	01-SEP-03	Seasonal update of climatological initial guess.
ADFs V3.6: NRT MIP_MW2_AXVIEC20031021_145505_20020706_060000_20080706_060000 MIP_OM2_AXVIEC20031021_145630_20020706_060000_20080706_060000 MIP_PS2_AXVIEC20031021_145858_20020706_060000_20080706_060000 MIP_PI2_AXVIEC20031021_145745_20020706_060000_20080706_060000 MIP_CS2_AXVIEC20031021_145337_20020706_060000_20080706_060000 MIP_SP2_AXVIEC20031021_150016_20020706_060000_20080706_060000 Off-line MIP_MW2_AXVIEC20031027_100858_20020706_060000_20080706_060000 MIP_OM2_AXVIEC20031027_101029_20020706_060000_20080706_060000 MIP_PS2_AXVIEC20031027_101319_20020706_060000_20080706_060000 MIP_PI2_AXVIEC20031027_101146_20020706_060000_20080706_060000 MIP_CS2_AXVIEC20031027_100559_20020706_060000_20080706_060000 MIP_SP2_AXVIEC20031027_101441_20020706_060000_20080706_060000	06-JUL-02	Activation of cloud detection; removal of the gaps between the altitude validity ranges; altitudes margins fixed to +/- 4 km; short-term ILS bug fix. **NRT** Old convergence criteria; nominal altitude range.

		Off-line Improved convergence criteria; altitude range extended to 6-68 km.
MIP_IG2_AXVIEC20031118_151533_20031201_000000_20081201_000000	01-DEC-03	Seasonal update of climatological initial guess.
MIP_IG2_AXVIEC20040227_081527_20040301_000000_20090301_000000	01-MAR-04	Seasonal update of climatological initial guess.
ADFs V3.7: NRT MIP_MW2_AXVIEC20031021_145505_20020706_060000_20080706_060000 MIP_OM2_AXVIEC20040302_110723_20020706_000000_20080706_000000 MIP_PS2_AXVIEC20040302_110923_20040109_000000_20090209_000000 MIP_PI2_AXVIEC20031021_145745_20020706_060000_20080706_060000 MIP_CS2_AXVIEC20031021_145337_20020706_060000_20080706_060000 MIP_SP2_AXVIEC20031021_150016_20020706_060000_20080706_060000 Off-line MIP_MW2_AXVIEC20031027_100858_20020706_060000_20080706_060000 MIP_OM2_AXVIEC20040302_110823_20020706_000000_20080706_000000 MIP_PS2_AXVIEC20040302_111023_20040109_000000_20090209_000000 MIP_PI2_AXVIEC20031027_101146_20020706_060000_20080706_060000 MIP_CS2_AXVIEC20031027_100559_20020706_060000_20080706_060000 MIP_SP2_AXVIEC20031027_101441_20020706_060000_20080706_060000	06-JUL-02 and 09-JAN-04	With respect to V3.6: Eliminated scans with one or two altitude levels; adjusted the threshold to the new noise level.
ADFs V3.8 NRT MIP_PS2_AXVIEC20040421_095623_20040326_143428_20090326_000000 Off-line MIP_PS2_AXVIEC20040421_095923_20040326_143428_20090326_000000	26-MAR-04	With respect to V3.7, adjusted the threshold to the new noise level.

IFAC provided three sets of ADFs still not disseminated:

- **ADFs V4.0**

  ADFs for processing of full resolution measurements, with MIP_PS2_AX file with noise level adjusted to interferometer heaters switched-on and flag set for processing of only nominal measurements.

- **ADFs V4.1**

  ADFs for processing of full resolution measurements, with MIP_PS2_AX file with noise level adjusted to interferometer heaters switched-off and flag set for processing of only nominal measurements.

- **ADFs V5.0**

  ADFs for processing of double-slide reduced resolution measurements in old configuration (17 sweeps per scan, fixed altitude – August/September 2004 data). Those ADFs contain new settings (convergence criteria, NESR threshold in MIP_PS2_AX) and new MWs (MIP_MW2_AX) and OMs (MIP_OM2_AX) optimised for the reduced resolution mode. They also contain a new MIP_PI2_AX updated taking into account the results of an investigation done by Bologna University on LOS. In fact, a new definition of the pointing covariance data was performed according to the available pointing characterization measurements. In particular, the errors on tangent altitude increments obtained from the analysis of LOS-specific measurements were found to be smaller (87 m versus 120 m) than those derived using an empirical model based on the pointing specifications. Tests on Level 2 p, T retrievals confirmed

that a LOS pointing error of about 80 m provides a constraint for p, T retrieval that is perfectly compliant with the observed limb radiances. Eighty metres is a reasonably conservative estimate of the error on tangent altitude increments that can be used in the PDS for operational MIPAS retrievals. Reduction of the LOS error from 120 to 80 m leads to a reduction of both p and T errors. Namely, on average, p error turns-out to be reduced from 1.27 to 1.1 % and T error turns-out to be reduced from 1.1 to 1.0 K. The delivered auxiliary data file containing LOS VCM data (MIP_PI2_AX) can be used in Level 2 to process both high and low resolution measurements acquired either in the new or in the old measurement scenario.

2.5.2 ANOMALY STATUS

Table 10 summarises the anomalies affecting Level 2 products and shows the associated SPR, NCR, AR and HD code.

Tab. 10 Level 2 anomaly list.

Anomaly	Prototype/DPM SPR	IPF NCR	AR	HD
Anomalous processing time	33	1127	1361	/
Zero pressure values	36	1278	1527	HD/06-2004/973
One-second discrepancy	/	1317	1577	HD/06-2004/970
Problem with PCD data set	/	1310	1570	HD/06-2004/1150
Wrong MIP_IG2_AX	/	/	1689	HD/12-2004/746
Jump anomaly	/	/	/	HD/01-2005/1013

2.5.2.1 Anomalous Processing Time

An anomalous processing time characterises processing of some offline products generated with IPF 4.59. Two different anomalies have been observed:

- 9 hours of processing instead of nominal 6 hours. Example:
MIP_NL__1POLRA20031006_005226_000060272020_00289_08359_1882.N1
MIP_NL__2PODPA20031006_005226_000060262020_00289_08359_0261.N1
- Processing failure after 24 hours of processing. Example:
MIP_NL__1POLRA20031024_012653_000060272021_00046_08617_0043.N1

For the first case, the anomaly is still under investigation. The second problem has been temporary solved with a new MIP_OM2_AX that filter scans composed by only one vertical level (generating a loop that causes the processing failure). For a definitive solution, the DMP will be changed (SPR 33) and the modifications will be implemented in next IPF delivery.

2.5.2.2 Zero Pressure Values

It was found a number of cases for which the retrieval in MIP_NL__2P has ended with a pressure value of zero, while the pressure-error for these cases is non-zero. Examples:
MIP_NL__2PODPA20020926_090044_000060362009_00437_02996_0041.N1
Scans #61, #62 and #63
MIP_NL__2PODPA20020926_123036_000055162009_00439_02998_0115.N1
Scans #54 and #58
MIP_NL__2PODPA20020926_140242_000060262009_00440_02999_0042.N1
Scans #60 and #61
MIP_NL__2PODPA20020926_154318_000060162009_00441_03000_0043.N1
Scan #60
MIP_NL__2PODPA20020926_172344_000060362009_00442_03001_0306.N1
Scan #60
MIP_NL__2PODPA20020926_190430_000060262009_00443_03002_0212.N1
Scans #64 and #65

The I/O DD has been changed (SPR 36) and the problem has been fixed in IPF 4.63.

2.5.2.3 One-Second Discrepancy

There are products where a one-second discrepancy between off-line and NRT products has been observed. Example:
Off-line
MIP_NL__2PPDPA20040321_032435_000060372025_00176_10751_0959.N1
SCAN GEOLOG ADS: dsr_time 21-MAR-2004 04:13:18.120870
NRT
MIP_NL__2PNPDE20040321_041241_000005672025_00176_10751_0878.N1
SCAN GEOLOG ADS: dsr_time 21-MAR-2004 04:13:17.120870

The problem has been rejected because the error has not been detected with IPF 4.63.

2.5.2.4 Problem with PCD Data Set

A byte mismatch affects the PCD dataset of some products

The problem has been rejected because it has been classified as a problem not related to MIPAS IPF.

2.5.2.5 Wrong MIP_IG2_AX

In February 2004 (IPF 4.59), some MIPAS Level 2 has been processed with a not updated MIP_IG2_AX. The anomaly affected only ESRIN products. The anomaly report has been rejected because considered too obsolete (log files lost).

2.5.2.6 Jump Anomaly

Oxford University detected a jump in the zonal means of all Level 2 NRT data produced after switch-on on 8th February until 16th February 2004, compared with Level 2 data generated from 17th March 2004 but also with the data until switch-off on 9th February 2004. The anomaly is still under investigation, but aux data activation can already be excluded as potential cause.