

GOME-2 / Metop-B instrument, PPF and auxiliary-data change history

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v1A	29/10/2012		After FM2 IOV
v2A	26/06/2013		After start of operations
v2B	10/09/2013		After start of tandem operations
v3	12/03/2013		Added moon intrusion (solar eclipse) table
v3A	17/06/2014		Update to PPF version 6
v3B	16/10/2014		Added moon intrusion (solar eclipse) table
v3C	26/06/2015		Update to PPF 6.1

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1 INTRODUCTION

1.1 Purpose and Scope

The document details all changes applied to the Metop-B GOME-2 level 0 to 1b data processor (PPF) with a potential impact on data quality, especially with respect to the quality of derived level 2 data. In addition to processor changes any substantial instrument or Metop-B satellite platform anomalies or events are listed here which have interrupted data-dissemination or may have affected level 1b and 2 data quality.

1.1.1 Document Structure

Section 2 provides a brief introduction on the provided tables and listings. Section 3 lists all events for instrument and PPF starting March 2007. Section 4 provides a detailed list with relevant changes applied to the PPF.

Note, that all times given in the document are UTC if not stated otherwise.

1.2 Documents

Routine monitoring results and additional documentation of Metop-B / GOME-2 processing is available at:

www.eumetsat.int > Service Status > Product Quality Monitoring > GOME-2 Instrument (<http://oiswww.eumetsat.org/epsreports/html/index.php?instrument=GOME>).

The GOME-2 instrument, processing and products newsletter is available under:

www.eumetsat.int > Service Status > Product Quality Monitoring > GOME-2 Newsletter (http://www.eumetsat.int/Home/Main/Satellites/Metop/Instruments/sp_2011011017745548)

The GOME-2 Product Users Guide is available online under:

<http://oiswww.eumetsat.int/WEBOPS/eps-pg/GOME-2/GOME2-PG-index.htm> .

EPS technical documentation including the documents listed in 1.2.1 can be found under:

www.eumetsat.int >Data & Products > Resources
(<http://www.eumetsat.int/Home/Main/DataProducts/Resources/index.htm?l=en>).

1.2.1 Applicable Documents

AD1	GOME-2 Products Guide	EUM/OPS- EPS/MAN/07/0445	Issue: v2C
AD2	GOME-2 L1 Product Generation	EPS.SYS.SPE.990011	Version: 7

	Specification		
AD3	GOME-2 L1 Product Format Specification	EPS.MIS.SPE.97232	Version: 9
AD4	Metop-B / GOME-2 PMD band definitions and PMD calibration	EUM/OPS- EPS/DOC/12/0714	Version 1A
AD5	Generic Product Format Specification	EPS.GGS.SPE.96167	Version 7D
AD6	GIOV TLMs Plan as run	S:\EPS GOME2\Metop-B\OPSpPlanning\GIOV MetOp-B TMLs plan as run - 280912.xls	Version 1

1.3 Abbreviations and Acronyms

CGS x	Core Ground Segment Number x
GOME	Global Ozone Monitoring Experiment
PDU	Product Dissemination Unit
GPFS	Generic Product Format Specification
PFS	Product Format Specification
PPF	Product Processing Facility
PGS	Product Generation Specification
PMD	Polarisation measurement devices
FPA	Focal Plane Assembly (Main instrument channels)
BU	Binary units

Auxiliary data tagging:

[Auxiliary data type]_[instrument model]_[version number]

STA:

GOME-2 Static auxiliary file, holding elevation model as well as Fresco transmission, reflectance and surface albedo database.

INS:

Initialisation file, holding GOME-2 level0 to 1b processor settings.

COR:

Correction file, holding GOME-2 instrument degradation correction parameters

CAL:

Calibration file, holding GOME-2 instrument keydata.

2 INTRODUCTION

Metop-B / GOME-2 level 1B data is disseminated since 13th of February 2013 via EUMETCast. Level 1A and 1B reconstructed full orbit data is also available from UMARF starting 18th of February 2013. Since 7th of May 2013 the data is labelled “operational”. The following PPF change history applies to all changes introduced as of 13th of February 2013 to processor and auxiliary data affecting the data content and/or quality of level 1A and 1B (more changes might have been applied to the processor, which however did not affect the science data). **Note that level 1 processor changes usually apply to both Metop-A and B processing change whereas auxiliary file changes may apply to only one chain.** The data is disseminated from our Core Ground Segment number 1 (CGS1) and tagged with O at the end of the file name. Note that all data tagged with C or T stems either from CGS2 or CGS3 and might therefore be of different quality than listed here! *Note also that changes to the processor applied during the Metop-B Satellite In-orbit Verification phase (SIOV) are not listed here!* **Data prior to the 13th of February 2013 has therefore to be treated with special caution!** In doubt, please contact EUMETSAT GOME CalVal staff for details or help (ops@eumetsat.int).

Events affecting the instrument, like satellite-platform or instrument anomaly switch-off phases, as well as non-nominal instrument operations are listed in a separate table. Updates to the product format are detailed in a table along with the version of applicable documents, products and processors.

3 EVENT HISTORY

3.1 Tabular PPF change history

Table of Metop-B / GOME-2 Processor and Auxiliary data version update for CGS1/EUMETCast/UMARF. Changes are indicated in blue.

Date	Processor Version	AUX data version	PFS version	PGS version
22/09/2012 Launch	5.3.0	STA_FM3_104 INS_FM2_100 COR_FM2_100 CAL_FM2_100	9	7
16/10/2012 GIOV	5.3.0	STA_FM3_104 INS_FM2_101 COR_FM2_100 CAL_FM2_100	9	7
28/11/2012 CALVAL Phase 1	5.3.0	STA_FM3_104 INS_FM2_102 COR_FM2_100 CAL_FM2_101	9	7
17/12/2012 CALVAL Phase 1	5.3.0	STA_FM2_100 INS_FM2_102 COR_FM2_100 CAL_FM2_102	9	7
07/05/2013 Operations	5.3.0	STA_FM2_100 INS_FM2_103 COR_FM2_100 CAL_FM2_103	9	7
17/06/2014 Operations	6.0.0	STA_FM2_100 INS_FM2_104 COR_FM2_100 CAL_FM2_103	9	7
26/06/2015 Operations	6.1.0	STA_FM2_100 INS_FM2_105 COR_FM2_100 CAL_FM2_104	9	7

3.2 Tabular instrument event history

Table of Metop-B / GOME-2 FM2 instrument events and operations. Note that the events start/stop times do not necessarily coincide with NRT data dissemination start/stop times!

Start date	End date	Start orbit	End orbit	Instrument event/operation	Type
17/09/2009		0		Launch	Nominal
25/10/2012 14:20:00	29/10/2012	539		PMD band settings upload 2.0 [AD2]: <ul style="list-style-type: none"> Reversed P and S settings. PMD band 13 pixel start is 1 pix too high 	Instrument operations
29/10/2012 13:20:00		595		First solar calibration.	Instrument operations
29/10/2012 18:11:30		598		PMD band settings 2.0 fixed as per [AD2]	Instrument operations
06/11/2012 5:20:00	06/11/2012 7:00:00	704	705	DSM set operations prior to phase 7 throughput test. FPA detector coolers off. Initial solar spectrum in orbit 705 at 7:07Z not valid.	Instrument operations
06/11/2012 7:00:00	09/11/2012 1:00:00	705	744	Instrument IOV phase 7 throughput test. PMD coolers to ground line and main channel detectors varying between 235K and 255K, Large jump (up to 0.04 nm) of spectral calibration assignment in channel 2 for wavelength larger than 370 nm following the loss of a monthly calibration.	Instrument operations
29/01/2013 8:00:00		1898		FM2 on 960 km swath as part of the "tandem-operation test for both instruments"	Instrument and processing
04/03/2013 16:35:58	11/03/2013 15:50:58	2387	2486	Darkness test (for testing signal level evolution on FM2). No science data available.	Instrument operations
14/03/2013 14:47:55	28/03/2013 11:30:00	2528	2726	The spectral calibration in channel 3 for wavelength larger than 360 nm exhibits a spurious jump to higher values within this period. Other regions are not affected.	Instrument and processing
29/01/2013	28/03/2013	1900	2726		
15/07/2013 15:44:54	n/a	4276	n/a	Start of Metop-A/B tandem operations. FM2 remains on the nominal 1960 km	Instrument and processing

| | | | [swath.](#)

3.3 Moon intrusion (solar eclipse) event history

Table of moon intrusion events which significantly reduce signal levels for the Metop-B / GOME-2 FM2 instrument.

Start	End / Duration (s)
13/11/2012 20:19	13/11/2012 20:25
13/11/2012 22:02	13/11/2012 22:11
09/05/2013 22:31	09/05/2013 22:49
23/10/2014 20:22	23/10/2014 20:39
23/10/2014 21:55	23/10/2014 22:08
23-Oct-2014 20:22:07	1021.04
23-Oct-2014 21:55:44	762.799
20-Mar-2015 09:08:53	853.861
20-Mar-2015 10:31:39	1189.177

3.4 Tabular level 1 product format change history

Table of product format and product generation specification change history including the product format version number, and as indicated in the products Main Product Header Record (MPHR). The MPHR record per orbit file is also displayed in the detailed orbit monitoring listing on gome.eumetsat.int under “Details”.

Start date	Start orbit	PFS version	GPFS version	Product format version ¹	Changes with respect to previous version	Applicable PPF versions
26/09/2012	122	7D	6.5	12.0	Initial version for FM2 Metop-B (similar version for Metop-A FM3 PPF 5.0 and later versions)	PPF 5.3 to ...

¹ as indicated in the MPHR of the product

4 DETAILED PPF EVOLUTION HISTORY

CalVal - 28th of November 2012 12:00 UTC

- Update of instrument key-data to adjust overlap-region and to account for the on-ground to in orbit change in Etalon.

CalVal - 17th of December 2012 12:00 UTC

- Update of instrument key-data to fix an issue with the irr-radiometric absolute calibration for PMD-S.
- Update of instrument key-data to provide ne look-up-tables and instrument specific parameters for the FRESCO+ cloud properties parameters provided in the product.

Pre-OPS: 13th of February 2013

- Start of pre-operational dissemination of level 1 data with processor version 5.3.0 via EUMETCast.

Pre-OPS: 18th of February 2013

- Reconstructed orbits of pre-operational level 1 data available in the archive (EO-portal).

7th May 2013, 10:00 UTC

Start of operational GOME-2 / Metop-B level 1 dissemination with processor version 5.3.0.

- Instrument key-data has been cleaned from spurious spectral and angular features known to have been introduced by the on-ground calibration campaign. The “cleaning” of key-data predominantly affects the spectral region between 425 and 500 nm in channel 2 (up to 0.5% in radiometric accuracy). Other regions are affected on the sub 0.1% level.

17.06.2014; 12:00 UTC

Changes of 6.0.0 with respect to 5.3.0

- Provision of additional cloud information from the AVHRR cloud mask on PMD read-out level in the MDR-1b Earthshine:CLOUD:CLOUD compound. The existing fields from PFS version 9 *CLOUD_PMD_1* and *CLOUD_PMD_2* are now filled with physical values for scene homogeneity and geometric cloud fraction.

For details see GOME-2 newsletter # 35 at

<http://www.eumetsat.int/website/home/TechnicalBulletins/GOME2/index.html>

For details on how to correctly apply PMD data information to main channel data please also consult the GOME-2 factsheet on spatial aliasing at

http://www.eumetsat.int/website/wcm/idc/idcplg?IdcService=GET_FILE&dDocName=PDF_GOME_FACTSHEET&RevisionSelectionMethod=LatestReleased&Rendition=Web

26.06.2015; 12:00 UTC

Changes of 6.1.0 with respect to 6.0.0

- Improved instrument key-data addressing the contamination with Xe-line structures and reducing residuals in viewing angle direction. The main impact on the radiometric calibration is expected in channel 3. For details see GOME-2 newsletter # 36 at <http://www.eumetsat.int/website/home/TechnicalBulletins/GOME2/index.html>