EUMETSAT Satellite Application Facility on
Support to Operational Hydrology and Water Management

EUMETSAT H SAF
SUPPORT TO OPERATIONAL HYDROLOGY AND WATER MANAGEMENT

# Product User Manual (PUM)
# for product H05B – P-AC-G-SEVIRI

# Accumulated precipitation at ground by blended MW and IR

| | |
|---|---|
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## DOCUMENT CHANGE RECORD

| Issue / Revision | Date | Description |
|---|---|---|
| 1.0 | 02/05/2017 | Baseline version prepared for ORR full disc |
| 1.1 | 08/09/2017 | RID acknowledgement from ORR full disc |

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# 1 Purpose of the document

Product User Manuals are available for each (pre)-operational H-SAF product, for open users, and also for demonstrational products, as necessary for *beta-users*.

Each PUM contains:

- Product introduction: principle of sensing, Satellites utilized, Instrument(s) description, Highlights of the algorithm, Architecture of the products generation chain, Product coverage and appearance;
- Main product operational characteristics: Horizontal resolution and sampling, Observing cycle and time sampling, Timeliness;
- Overview of the product validation activity: Validation strategy, Global statistics, Product characterisation;
- Basic information on product availability: Access modes, Description of the code, Description of the file structure.

Annexes also provide general information on H-SAF and the list of the acronyms used in the document.

# 2 Introduction to product P-AC-G-SEVIRI

## 2.1 Principle of sensing

Product H05B (P-AC-G-SEVIRI over the full disk area) is based on frequent precipitation measurements as retrieved by blending LEO MW-derived precipitation rate measurements and GEO IR imagery. The input data are therefore P-IN-GRU-SEVIRI. The covered area is shown in **Figure 1**, same as for P-IN-GRU-SEVIRI.

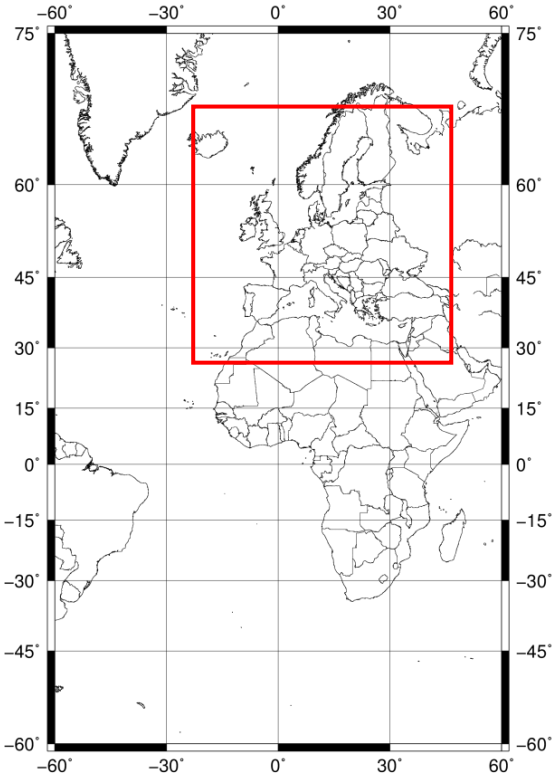



**Figure 1 The P-AC-G-SEVIRI coverage 60°S-75°N , 60°W - 60°E. The HSAF area is indicated by the red square**

## 2.2 Status of satellites and instruments

P-AC-G-SEVIRI does not retrieve precipitation. It performs time integration of frequent precipitation data available as products P-IN-GRU-SEVIRI (Rapid Update: see PUM-03B). This is actually based on the Meteosat SEVIRI and on the DMSP SSMIS (see PUM-01B) or the NOAA and MetOp AMSU-A and MHS (see PUM-02B); it is not excluded the use of precipitation estimations from other MW instruments. The current status of the satellites having a bearing on P-AC-G-SEVIRI is shown in next table:

| Satellite | Launch | End of service | Height | LST | Status | Instruments for P-IN-GRU-SEVIRI |
|---|---|---|---|---|---|---|
| DMSP-F16 | 18 Oct 2003 | expected ≥ 2016 | 833 km | 21:32 a | Secondary Operation | SSMIS |
| DMSP-F17 | 4 Nov 2006 | expected ≥ 2016 | 850 km | 17:30 a | Primary Operation | SSMIS |
| DMSP-F18 | 18 Oct 2009 | expected ≥ 2016 | 850 km | 17:31 a | Primary Operation | SSMIS |
| MetOpA | 19 Oct 2006 | expected ≥ 2018 | 817 km | 09:31 d | Operational | AMSU-A (defective), MHS |
| MetOpB | 17 Sep 2012 | expected ≥ 2023 | 817 Km | 09:30 d | Operational | AMSU-A, MHS |
| NOAA-18 | 20 May 2005 | expected ≥ 2016 | 870 km | 14:00 a | Operational | AMSU-A, MHS |
| NOAA-19 | 6 Feb 2009 | expected ≥ 2016 | 870 km | 14:00 a | Operational | AMSU-A, MHS (defective) |
| GCOM-W | 18 May 2012 | expected ≥ 2016 | 700 km | 13:30 a | Operational | AMSR-2 |
| NPP | 28 Oct 2011 | expected ≥ 2020 | 824 Km | 13:30 a | Operational | ATMS |
| Meteosat-10 | 5 Jul 2012 | expected ≥ 2022 | GEO: 0° | | Operational | SEVIRI |

**Table 1 Current status of satellites utilised for P-AC-G-SEVIRI**

Next table collects the main features of SEVIRI.

| SEVIRI | Spinning Enhanced Visible Infra-Red Imager |
|---|---|
| **Satellites** | **Meteosat-8, Meteosat-9, Meteosat-10, Meteosat-11** (i.e., Meteosat Second Generation) |
| **Status** | **Operational** - Utilised in the period: 2002 to ~ 2021 |
| **Mission** | Multi-purpose imagery and wind derivation by tracking clouds and water vapour features |
| **Instrument type** | Multi-purpose imaging VIS/IR radiometer - 12 channels (11 narrow-bandwidth, 1 high-resolution broad-bandwidth VIS) |
| **Scanning technique** | N/A (GEO) |
| **Coverage/cycle** | Full disk every 15 min. Limited areas in correspondingly shorter time intervals |
| **Resolution (s.s.p.)** | 4.8 km IFOV, 3 km sampling for narrow channels; 1.4 km IFOV, 1 km sampling for broad VIS channel |
| **Resources** | Mass: 260 kg - Power: 150 W - Data rate: 3.26 Mbps |

| **Central wavelength** | **Spectral interval** (99 % encircled energy) | **Radiometric accuracy (SNR or NEΔT)** |
|---|---|---|
| N/A (broad bandwidth channel) | 0.6 - 0.9 µm | 4.3 @ 1 % albedo |
| 0.635 µm | 0.56 - 0.71 µm | 10.1 @ 1 % albedo |
| 0.81 µm | 0.74 - 0.88 µm | 7.28 @ 1 % albedo |
| 1.64 µm | 1.50 - 1.78 µm | 3 @ 1 % albedo |
| 3.92 µm | 3.48 - 4.36 µm | 0.35 K @ 300 K |
| 6.25 µm | 5.35 - 7.15 µm | 0.75 K @ 250 K |
| 7.35 µm | 6.85 - 7.85 µm | 0.75 K @ 250 K |
| 8.70 µm | 8.30 - 9.10 µm | 0.28 K @ 300 K |
| 9.66 µm | 9.38 - 9.94 µm | 1.50 K @ 255 K |
| 10.8 µm | 9.80 - 11.8 µm | 0.25 K @ 300 K |
| 12.0 µm | 11.0 - 13.0 µm | 0.37 K @ 300 K |
| 13.4 µm | 12.4 - 14.4 µm | 1.80 K @ 270 K |

**Table 2 Main features of SEVIRI**

## 2.3 Highlights of the algorithm

The baseline algorithm for P-AC-G-SEVIRI processing is described in ATBD-05B. Only essential elements are highlighted here.

The next figure shows the flow chart of the P-AC-G-SEVIRI processing chain:

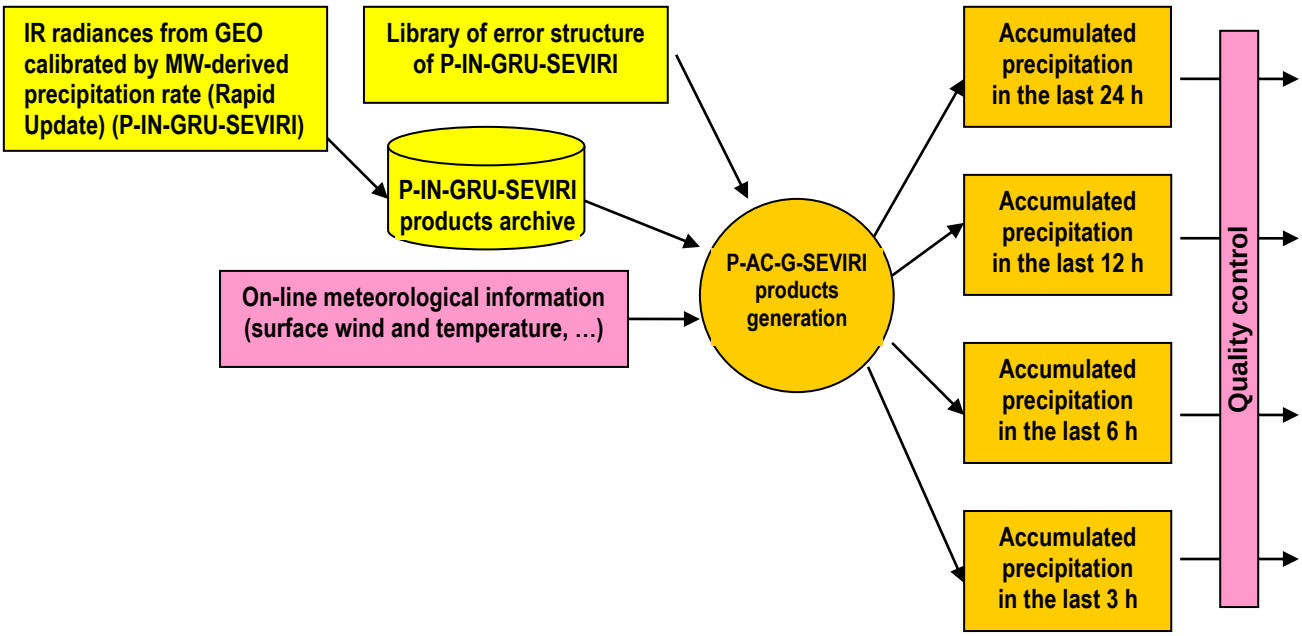



**Figure 2 Flow chart of the accumulated precipitation processing chain**

The P-AC-G-SEVIRI products is generated every 3 hours and distributed at synoptic hours (00, 03, 06, 09, 12, 15, 18, 21 UTC). The product incorporates precipitation rate retrievals from data collected up to synoptic hours. The periods of integration of blended MW+IR retrievals at 15-min intervals (P-IN-GRU-SEVIRI) are the previous 3, 6, 12 and 24 hours.

The product quality depends on the type of precipitation and, to a minor extent, the period of integration.

## 2.4 Architecture of the products generation chain

The architecture of the P-AC-G-SEVIRI product generation chain is shown here below:

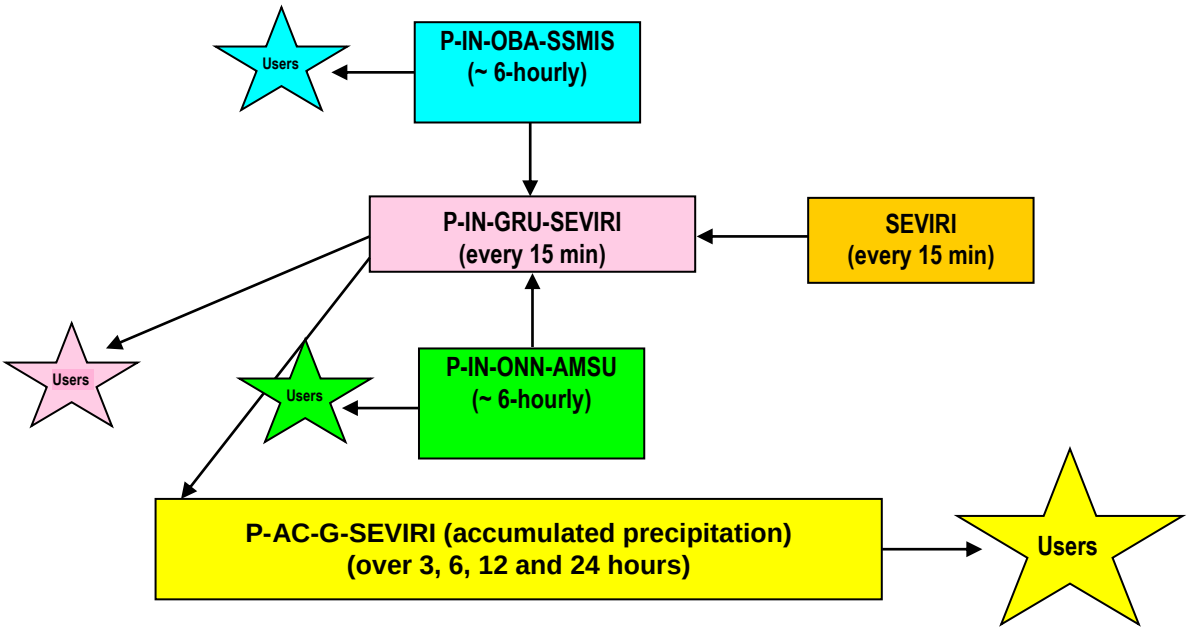
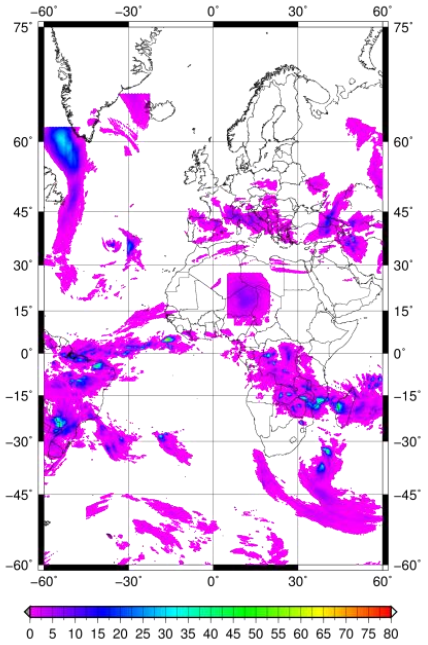



**Figure 3 Architecture of the P-AC-G-SEVIRI product generation chain**

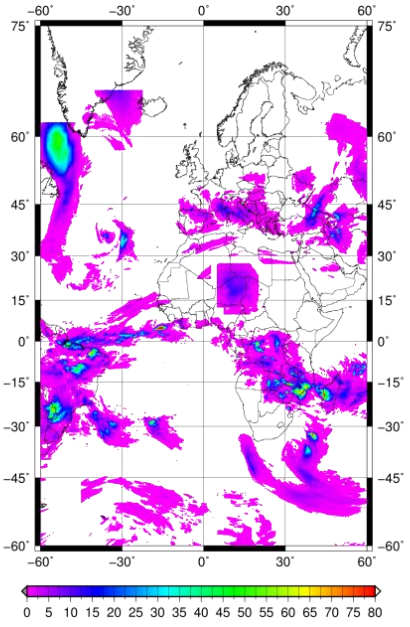
The figure highlights that P-AC-G-SEVIRI is the final stage of all previous precipitation product chains:

- the *Rapid Update* process based on (frequent) SEVIRI IR images "calibrated" by the (infrequent) MW-derived precipitation data as retrieved from SSMIS (P-IN-OBA-SSMIS) or from AMSU-A and AMSU-B or MHS (P-IN-ONN-AMSU);

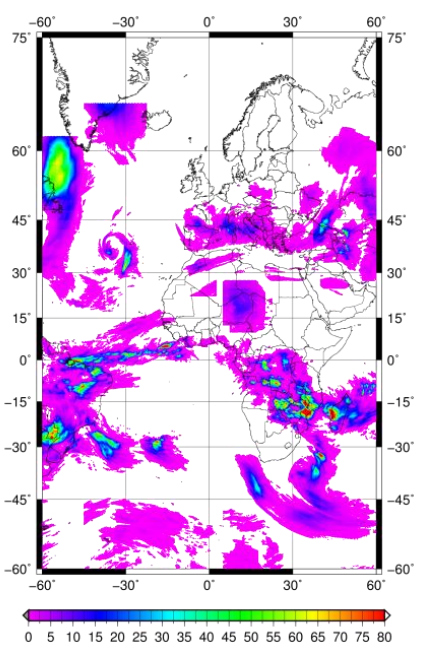
Figure 4 shows the 3,6,12,24 hours accumulated product. The projection is Mercator *rectangular stereographic centred on 0°N, 0°E*. The binary product is coded accordingly SEVIRI grid in GRIB2 format.



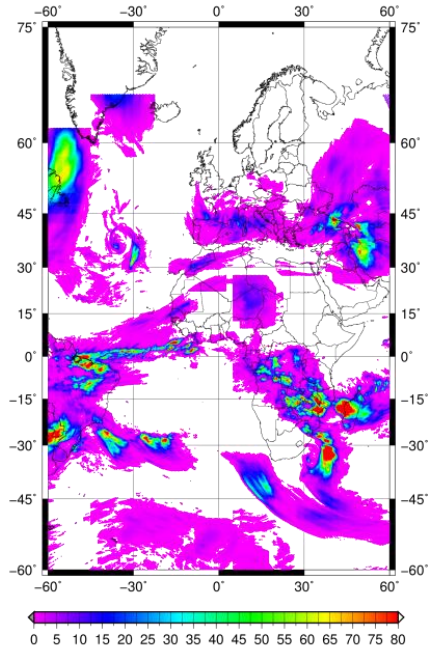

**03 Feb 2015, time 00 UTC – 3 hours cumulative precipitation.**




**03 Feb 2015, time 00 UTC – 6 hours cumulative precipitation.**




**03 Feb 2015, time 00 UTC – 12 hours cumulative precipitation.**




**03 Feb 2015, time 00 UTC – 24 hours cumulative precipitation.**

**Figure 4 The P-AC-G-SEVIRI product accumulated precipitation over 3,6,12,24 hours**

# 3 Product operational characteristics

## 3.1 Horizontal resolution and sampling

The *horizontal resolution ($\Delta x$)*. The horizontal resolution descends from the instrument Instantaneous Field of View (IFOV), sampling distance (pixel), Modulation Transfer Function (MTF) and number of pixels to co-process for filtering out disturbing factors (e.g. clouds) or improving accuracy. The IFOV of SEVIRI images is 4.8 km at nadir, and degrades moving away from nadir, becoming about 8 km at the poles.

## 3.2 Observing cycle and time sampling

The *observing cycle ($\Delta t$)* is defined as the average time interval between two measurements over the same area. However, P-AC-G-SEVIRI does not make use of observations, but only of products that, in the case of P-IN-GRU-SEVIRI, are updated at 15-min intervals, thus the concept is not applicable. The P-AC-G-SEVIRI product is generated each 3 hours by integrating over the previous 3, 6, 12 and 24 hours. We could refer to the product generation rate and, although inappropriately, quote as observing cycle: ***$\Delta t$ = 3 h***, and as sampling time also ***3 h.***

## 3.3 Timeliness

The *timeliness ($\delta$)* is defined as the time between observation taking and product available at the user site assuming a defined dissemination mean. The timeliness depends on the satellite transmission facilities, the availability of acquisition stations, the processing time required to generate the product and the reference dissemination means. This concept is not applicable to P-AC-G-SEVIRI, that has only remote relationship with the originating observations. The closest relationship is with P-IN-GRU-SEVIRI. After each full 3 hours, the product is processed within 15 min, to be added to the 15-min timeliness of the P-IN-GRU-SEVIRI frame last entering the time integration process. Thus the timeliness is, at worst, ***$\delta$ ~ 0.5 h***.

# 4 Product validation

### 4.1.1 Quality assessment

Whereas the previous operational characteristics have been evaluated on the base of system considerations (number of satellites, their orbits, access to the satellite) and instrument features (IFOV, swath, MTF and others), the evaluation of accuracy requires validation, i.e. comparison with the ground truth or with something assumed as "true". P-AC-G-SEVIRI, as any other H-SAF product, is submitted to continuous quality assessment and validation activity entrusted to a number of institutes (see figure below).

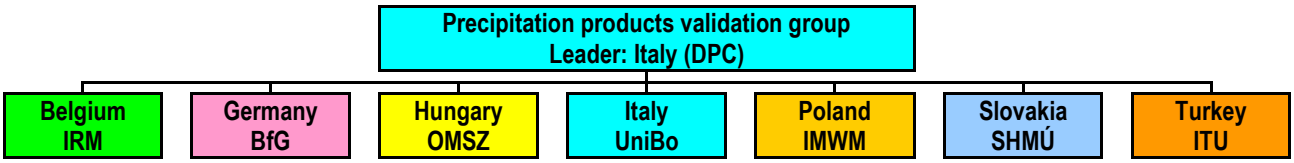



**Figure 5 Structure of the Precipitation products validation team**

Precipitation data are compared with rain gauges and meteorological radar. Before undertaking comparison, ground data and satellite data have been submitted to scaling and filtering procedures. Two streams of activities are carried out:

- evaluation of general statistics (multi-categorical and continuous), to help in identifying existence of pathological behaviour
- selected case studies, useful in identifying the roots of such behaviour.

Detailed report of the product validation activity for product P-AC-G-SEVIRI is provided as document:

- PVR-05: Product Validation Report for P-AC-G-SEVIRI.

### 4.1.2 Product Accuracy

User requirements for precipitation observation have been stated by authoritative entities such as WMO, EUMETSAT and the GPM planning group. Those requirements are based on the Correlation Coefficient as statistical score evaluated for daily precipitation only (mm/24h) on open classes of precipitation as expressed by the table below:

| Threshold | Target | Optimal |
|---|---|---|
| • 190% for all accumulation, | • 100% for all accumulation, | • 45% for all accumulation, |

**Table 3 H-SAF Accuracy requirements for H05B (Overall Accuracy)**

# 5 Product availability

## 5.1 Terms of Use

All H-SAF products are owned by EUMETSAT, and the EUMETSAT SAF Data Policy applies.

All intellectual property rights of the H-SAF products belong to EUMETSAT. The use of these products is granted to every interested user, free of charge. If you wish to use these products, EUMETSAT's copyright credit must be shown by displaying the words "copyright (year) EUMETSAT" on each of the products used.

## 5.2 General Information

To access the H-SAF products the user must register at the H-SAF Official Web Portal http://hsaf.meteoam.it/ from which it is possible to access to the "H-SAF Product Download Centre", which allows users to access data as described here following.

1) Access to data produced in the last 60 days must be made by the Official H-SAF FTP server ftp://ftphsaf.meteoam.it (to obtain user and password, please submit registration form on H-SAF Official Web Portal or contact the help desk at us_hsaf@meteoam.it) and via EUMETCAST, a multi-service dissemination system based on standard Digital Video Broadcast (DVB) technology (for more information http://www.eumetsat.int/).
2) The access to the archived data must be performed through an order process. There are two ways to place an order:
    a. the first (link) is a basic function provided directly from the H-SAF Web Portal. It provides all basic functions to carry out orders by selecting one or more products and setting for each selected product an expected time range;
    b. The second function https://eoportal.eumetsat.int/ allows access to EUMETSAT Data Centre. A registration to EUMETSAT portal is required. The EUMETSAT Data Center offers advanced functions of management and control of orders, among which the possibility to make geographical selection of products, to make the cloning of orders, and to monitor the status of the orders.

    In Both cases the orders placed will be submitted for approval and will be delivered within three working days.

Finally, quick-looks of the latest 20 maps can be viewed as PNG images or as an animated slideshow on the H-SAF Web Portal.

## 5.3 Formats and codes

Two type of files are provided for P-AC-G-SEVIRI:

- the digital data that include the precipitation values and the associated quality flag, both coded in GRIB2;
- the image-like maps, coded in PNG, both for data values and quality indicator

On the ftp server in the "*utilities*" directory, the folder *Grib_decode* provides the instructions for decode the digital data

## 5.4 Description of the files

Product P-AC-G-SEVIRI is the Accumulated precipitation rate at ground by blended MW and IR. It is also identified as H05B product of the H-SAF product list. The table below shows the detailed information to access the product using the H-SAF FTP server (ftp://ftphsaf.meteoam.it)

| P-AC-G-SEVIRI Data | |
|---|---|
| Description | |
| Content: Accumulated precipitation rate at ground by blended MW and IR<br><br>Repository root directory: ftp://ftphsaf.meteoam.it/products/h05B<br>h05B_yyyymmdd_hhmm_zz_fdk.grb.gz<br>Namespace description<br>• yyyymmdd: year, month, day<br>• hhmm: hour and minute<br>• zz: number of previous hours of precipitation accumulation (03, 06, 12, 24)<br>• fdk (fixed value): stands for full disk<br><br>Suffix for Digital Data: ".grb.gz" (compressed GRIB file)<br>Suffix for Image Data: ".png" (image data file) | |
| P-AC-G-SEVIRI Digital Data | |
| Sub-repository | /h05_cur_mon_data (data of last 60 days) |
| File name | h05B_yyyymmdd_hhmm_zz_fdk.grb.gz<br>Example:<br>ftp://ftphsaf.meteoam.it/products/h05B/h05_cur_mon_data/h05B_20150210_1200_24_fdk.grb.gz |
| P-AC-G-SEVIRI Image Data | |
| Sub-repository | /h05_cur_mon_png (data of last 60 days) |
| File name | h05B_yyyymmdd_hhmm_zz_fdk.png<br>Example:<br>ftp://ftphsaf.meteoam.it/products/h05B/h05_cur_mon_png/h05B_20150210_1500_12_fdk.png |

**Table 4 Summary instructions for accessing P-AC-G-SEVIRI data**

## 5.5 Output description

The P-AC-G-SEVIRI output is a cumulated precipitation map generated from integration of P-IN-GRU-SEVIRI product. It is encoded as a GRIB2 (please refer to WMO GRIB2 format documentation available at www.wmo.int), with the following keys:

```
GRIB2
  /* gribSection0 */
  /* 3 = Space products (grib2/0.0.table)  */
  discipline,3
  editionNumber,2
  /* section 1 */
  /* 80 = Rome (RSMC) (grib1/0.table)  */
  identificationOfOriginatingGeneratingCentre,80
  identificationOfOriginatingGeneratingSubCentre,0
  /* 3 = Current operational version number implemented on 2 November 2005 (grib2/1.0.table)  */
  gribMasterTablesVersionNumber,3
  /* 0 = Local tables not used (grib2/1.1.table)  */
  versionNumberOfGribLocalTables,0
  /* 3 = Observation time (grib2/1.2.table)  */
  significanceOfReferenceTime,3
   /* 3 = Observation time (grib2/1.2.table)  */
  significanceOfReferenceTime,3
  year,
  month,
  day,
```

```
hour,
minute,
second,
/* 1 = Operational test products (grib2/1.3.table)  */
productionStatusOfProcessedData,1
/* 6 = Processed satellite observations (grib2/1.4.table)  */
typeOfProcessedData,6
/* 0 = Specified in Code table 3.1 (grib2/3.0.table)  */
sourceOfGridDefinition",
numberOfDataPoints, 13778944
numberOfOctetsForOptionalListOfNumbersDefiningNumberOfPoints,0
/* 0 = There is no appended list (grib2/3.11.table)  */
interpretationOfListOfNumbersDefiningNumberOfPoints,0
/* 90 = Space view perspective orthographic (grib2/3.1.table)  */
gridDefinitionTemplateNumber,90
/* 3 = Earth assumed oblate spheroid with major and minor axes specified by data producer (grib2/3.2.table)  */
shapeOfTheEarth,3
scaleFactorOfRadiusOfSphericalEarth,0
scaledValueOfRadiusOfSphericalEarth,0
scaleFactorOfMajorAxisOfOblateSpheroidEarth,4
scaledValueOfMajorAxisOfOblateSpheroidEarth,63781400
scaleFactorOfMinorAxisOfOblateSpheroidEarth,4
scaledValueOfMinorAxisOfOblateSpheroidEarth,63567550
numberOfPointsAlongXAxis,3712
numberOfPointsAlongYAxis,3712
latitudeOfSubSatellitePoint,0
longitudeOfSubSatellitePoint,0
/* 0 = 00000000
(3=0)  i direction increments not given
(4=0)  j direction increments not given
(5=0)  Resolved u- and v- components of vector quantities relative to easterly and northerly directions
See grib2/3.3.table */
resolutionAndComponentFlags,0
apparentDiameterOfEarthInGridLengthsInXDirection",3622
apparentDiameterOfEarthInGridLengthsInYDirection",3568
xCoordinateOfSubSatellitePoint",764000
yCoordinateOfSubSatellitePoint",1774000
/* 0 = 00000000
(1=0)  Points of first row or column scan in the +i (+x) direction
(2=0)  Points of first row or column scan in the -j (-y) direction
(3=0)  Adjacent points in i (x) direction are consecutive
(4=0)  All rows scan in the same direction
See grib2/3.4.table */
scanningMode,0
orientationOfTheGrid,0
altitudeOfTheCameraFromTheEarthSCenterMeasuredInUnitsOfTheEarth,6610700
xCoordinateOfOriginOfSectorImage,0
yCoordinateOfOriginOfSectorImage,0
/* grib 2 Section 4 PRODUCT DEFINITION SECTION */
numberOfCoordinatesValues,0
/* 30 = Satellite product (grib2/4.0.table)  */
productDefinitionTemplateNumber,30
/* 1 = Quantitative products (grib2/4.1.3.table)  */
parameterCategory,1
/* 0 = Estimated precipitation (kg m-2) (grib2/4.2.3.1.table)  */
parameterNumber,0
/* 8 = Observation (grib2/4.3.table)  */
typeOfGeneratingProcess,8
observationGeneratingProcessIdentifier,3
numberOfContributingSpectralBands,1
/* grib 2 Section 5 DATA REPRESENTATION SECTION */
```

```
numberOfValues, 13778944
/* 0 = Grid point data - simple packing (grib2/5.0.table)  */
dataRepresentationTemplateNumber,0
decimalScaleFactor,0
numberOfBitsContainingEachPackedValue,16
/* 0 = Floating point (grib2/5.1.table)  */
typeOfOriginalFieldValues,0
/* grib 2 Section 6 BIT-MAP SECTION */
/* 0 = Bit map is present in this product (grib2/6.0.table)  */
bitMapIndicator,0
missingValue,0.0
/* grib 2 Section 7 data */
/* grib 2 Section 8 END */
```

# Annex 1: Introduction to H-SAF

## 5.6 The EUMETSAT Satellite Application Facilities

H-SAF is part of the distributed application ground segment of the "*European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)*". The application ground segment consists of a "*Central Application Facilities*" located at EUMETSAT Headquarters, and a network of eight "*Satellite Application Facilities (SAFs)*", located and managed by EUMETSAT Member States and dedicated to development and operational activities to provide satellite-derived data to support specific user communities (see Figure 6):

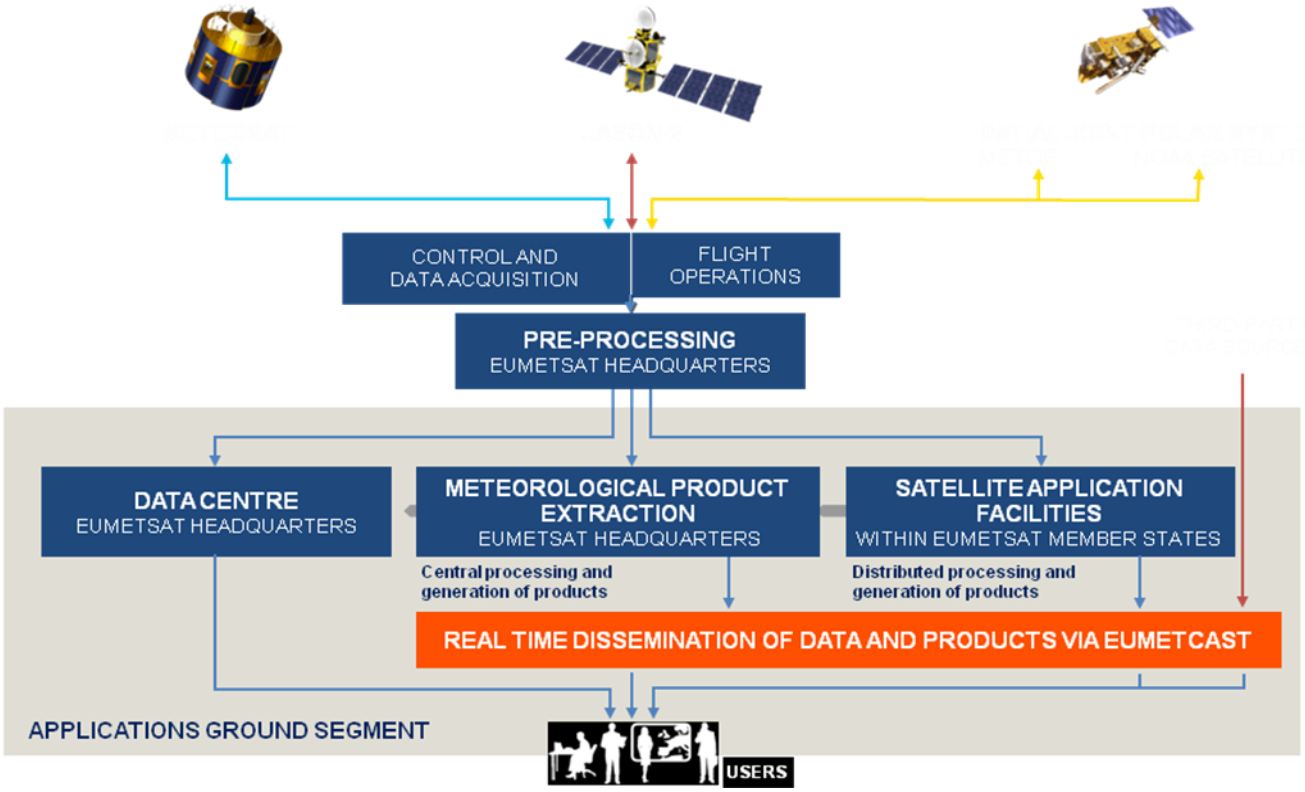



**Figure 6: Conceptual scheme of the EUMETSAT Application Ground Segment**

Figure here following depicts the composition of the EUMETSAT SAF network, with the indication of each SAF's specific theme and Leading Entity.

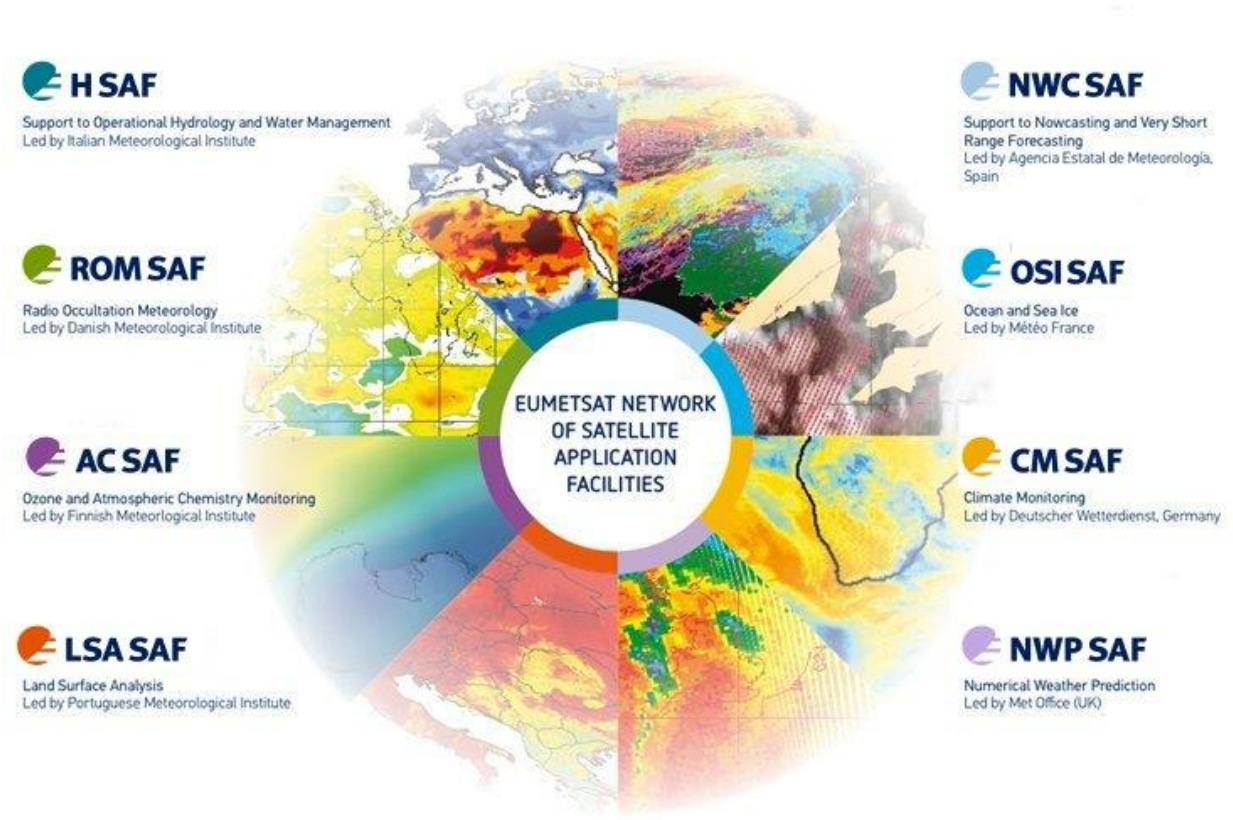



**Figure 7: Current composition of the EUMETSAT SAF Network**

## 5.7 Purpose of the H-SAF

The main objectives of H-SAF are:

***a.*** ***to provide new satellite-derived products*** from existing and future satellites with sufficient time and space resolution to satisfy the needs of operational hydrology, by generating, centralizing, archiving and disseminating the identified products:

- precipitation (liquid, solid, rate, accumulated);
- soil moisture (at large-scale, at local-scale, at surface, in the roots region);
- snow parameters (detection, cover, melting conditions, water equivalent);

***b.*** ***to perform independent validation of the usefulness of the products*** for fighting against floods, landslides, avalanches, and evaluating water resources; the activity includes:

- downscaling/upscaling modelling from observed/predicted fields to basin level;
- fusion of satellite-derived measurements with data from radar and raingauge networks;
- assimilation of satellite-derived products in hydrological models;
- assessment of the impact of the new satellite-derived products on hydrological applications.

## 5.8 Products / Deliveries of the H-SAF

For the full list of the Operational products delivered by H-SAF, and for details on their characteristics, please see H-SAF website hsaf.meteoam.it.
All products are available via EUMETSAT data delivery service (EUMETCast, http://www.eumetsat.int/website/home/Data/DataDelivery/EUMETCast/index.html), or via ftp download; they are also published in the H-SAF website hsaf.meteoam.it.


## 5.9 System Overview

H-SAF is led by the Italian Air Force Meteorological Service (ITAF MET) and carried on by a consortium of 21 members from 11 countries (see website: hsaf.meteoam.it for details)
Following major areas can be distinguished within the H-SAF system context:

- Product generation area
- Central Services area (for data archiving, dissemination, catalogue and any other centralized services)
- Validation services area which includes Quality Monitoring/Assessment and Hydrological Impact Validation.

Products generation area is composed of 5 processing centres physically deployed in 5 different countries; these are:

- for precipitation products: ITAF COMET (Italy)
- for soil moisture products: ZAMG (Austria), ECMWF (UK)
- for snow products: TSMS (Turkey), FMI (Finland)

Central area provides systems for archiving and dissemination; located at ITAF COMET (Italy), it is interfaced with the production area through a front-end, in charge of product collecting.
A central archive is aimed to the maintenance of the H-SAF products; it is also located at ITAF COMET.
Validation services provided by H-SAF consists of:

- Hydrovalidation of the products using models (hydrological impact assessment);
- Product validation (Quality Assessment and Monitoring).

Both services are based on country-specific activities such as impact studies (for hydrological study) or product validation and value assessment.
Hydrovalidation service is coordinated by IMWM (Poland), whilst Quality Assessment and Monitoring service is coordinated by DPC (Italy): The Services' activities are performed by experts from the national meteorological and hydrological Institutes of Austria, Belgium, Bulgaria, Finland, France, Germany, Hungary, Italy, Poland, Slovakia, Turkey, and from ECMWF.

## Annex 2: Acronyms

| | |
|---|---|
| AMSU | Advanced Microwave Sounding Unit (on NOAA and MetOp) |
| AMSU-A | Advanced Microwave Sounding Unit - A (on NOAA and MetOp) |
| AMSU-B | Advanced Microwave Sounding Unit - B (on NOAA up to 17) |
| ATDD | Algorithms Theoretical Definition Document |
| AU | Anadolu University (in Turkey) |
| BfG | Bundesanstalt für Gewässerkunde (in Germany) |
| CAF | Central Application Facility (of EUMETSAT) |
| CDOP | Continuous Development-Operations Phase |
| CESBIO | Centre d'Etudes Spatiales de la BIOsphere (of CNRS, in France) |
| CM-SAF | SAF on Climate Monitoring |
| COMet | Centro Operativo per la Meteorologia (in Italy) |
| CNR | Consiglio Nazionale delle Ricerche (of Italy) |
| CNRS | Centre Nationale de la Recherche Scientifique (of France) |
| DMSP | Defense Meteorological Satellite Program |
| DPC | Dipartimento Protezione Civile (of Italy) |
| EARS | EUMETSAT Advanced Retransmission Service |
| ECMWF | European Centre for Medium-range Weather Forecasts |
| EDC | EUMETSAT Data Centre, previously known as U-MARF |
| EUM | Short for EUMETSAT |
| EUMETCast | EUMETSAT's Broadcast System for Environmental Data |
| EUMETSAT | European Organisation for the Exploitation of Meteorological Satellites |
| FMI | Finnish Meteorological Institute |
| FTP | File Transfer Protocol |
| GEO | Geostationary Earth Orbit |
| GRAS-SAF | SAF on GRAS Meteorology |
| HDF | Hierarchical Data Format |
| HRV | High Resolution Visible (one SEVIRI channel) |
| H-SAF | SAF on Support to Operational Hydrology and Water Management |
| IDL© | Interactive Data Language |
| IFOV | Instantaneous Field Of View |
| IMWM | Institute of Meteorology and Water Management (in Poland) |
| IPF | Institut für Photogrammetrie und Fernerkundung (of TU-Wien, in Austria) |
| IPWG | International Precipitation Working Group |
| IR | Infra Red |
| IRM | Institut Royal Météorologique (of Belgium) (alternative of RMI) |
| ISAC | Istituto di Scienze dell'Atmosfera e del Clima (of CNR, Italy) |
| ITU | İstanbul Technical University (in Turkey) |
| LATMOS | Laboratoire Atmosphères, Milieux, Observations Spatiales (of CNRS, in France) |
| LEO | Low Earth Orbit |
| LSA-SAF | SAF on Land Surface Analysis |
| LST | Local Satellite Time (if referred to time) or Land Surface Temperature (if referred to temperature) |
| Météo France | National Meteorological Service of France |
| METU | Middle East Technical University (in Turkey) |
| MHS | Microwave Humidity Sounder (on NOAA 18 and 19, and on MetOp) |
| MSG | Meteosat Second Generation (Meteosat 8, 9, 10, 11) |
| MVIRI | Meteosat Visible and Infra Red Imager (on Meteosat up to 7) |
| MW | Micro Wave |
| NEΔT | Net Radiation |
| NESDIS | National Environmental Satellite, Data and Information Services |
| NMA | National Meteorological Administration (of Romania) |
| NOAA | National Oceanic and Atmospheric Administration (Agency and satellite) |
| NWC-SAF | SAF in support to Nowcasting & Very Short Range Forecasting |
| NWP | Numerical Weather Prediction |
| NWP-SAF | SAF on Numerical Weather Prediction |

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| O3M-SAF | SAF on Ozone and Atmospheric Chemistry Monitoring |
| OMSZ | Hungarian Meteorological Service |
| ORR | Operations Readiness Review |
| OSI-SAF | SAF on Ocean and Sea Ice |
| PDF | Probability Density Function |
| PEHRPP | Pilot Evaluation of High Resolution Precipitation Products |
| Pixel | Picture element |
| PMW | Passive Micro-Wave |
| PP | Project Plan |
| PR | Precipitation Radar (on TRMM) |
| PUM | Product User Manual |
| PVR | Product Validation Report |
| RMI | Royal Meteorological Institute (of Belgium) (alternative of IRM) |
| RR | Rain Rate |
| RU | Rapid Update |
| SAF | Satellite Application Facility |
| SEVIRI | Spinning Enhanced Visible and Infra-Red Imager (on Meteosat from 8 onwards) |
| SHMÚ | Slovak Hydro-Meteorological Institute |
| SSM/I | Special Sensor Microwave / Imager (on DMSP up to F-15) |
| SSMIS | Special Sensor Microwave Imager/Sounder (on DMSP starting with S-16) |
| SYKE | Suomen ympäristökeskus (Finnish Environment Institute) |
| $T_{BB}$ | Equivalent Blackbody Temperature (used for IR) |
| TKK | Teknillinen korkeakoulu (Helsinki University of Technology) |
| TMI | TRMM Microwave Imager (on TRMM) |
| TRMM | Tropical Rainfall Measuring Mission UKMO |
| TSMS | Turkish State Meteorological Service |
| TU-Wien | Technische Universität Wien (in Austria) |
| U-MARF | Unified Meteorological Archive and Retrieval Facility |
| UniBo | University of Bologna (in Italy) |
| URD | User Requirements Document |
| UTC | Universal Coordinated Time |
| VIS | Visible |
| ZAMG | Zentralanstalt für Meteorologie und Geodynamik (of Austria) |