EUMETSAT Satellite Application Facility on Climate Monitoring

CDOP 2

Service Specifications

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Document Signature Table

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Author	Petra Fuchs Rainer Hollmann	Head of CM SAF Operations Science Coordinator		20. January 2017
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Document Change Record

Issue/ Revision	Date	DCN No.	Changed Pages/Paragraphs
2.0	25/09/2012	SAF/CM/DWD/SeSp	Initial Issue for CDOP-2, based on SAF/CM/DWD/SeSp/1, Issue 1.8, dated 12/11/2011 Update of SeSp following approval of SG to release the AVHRR GAC data sets after implementation of DRI5 Close-out review comments.
2.1	16/04/2013	SAF/CM/DWD/SeSp	Update of CM-127 entry acc. to RID JoS031 to draft baseline documents Included definition of terms With CDOP-2 the following products has been discontinued and marked acc. In Annex 2: Included SeSp for CM-150 and CM-69 (CDOP2_SG2_D7) Approval of SeSp 2.1 (CDOP2_SG3_D5)
Draft 2.2	03/08/2013	SAF/CM/DWD/SeSp	Included SeSp for the following data sets: CM-113, CM-115 (CDOP2_SG3_D7) CM-123, CM-132, CM-138, CM-139 (CDOP2_SG4_D12) CM-06, CM-12, CM-18, CM-35, CM-39, CM-44, CM-46, CM-53, CM-61, CM-68, CM-75, CM-82, CM-89, CM-96, CM-102, CM-103, CM-105, CM-107, CM-109, CM-110 (CDOP2_SG4_D13)
2.3	03.02.2014	SAF/CM/DWD/SeSp	Chapt. 41.6 / SS-25 delete “meteorological” (according to 4th SG meeting)
Draft 2.4	12.12.2014	SAF/CM/DWD/SeSp	Included SeSp for the following data sets: CM-21012 (CDOP2_SG6_D1) CM-23081, CM-23201, CM-23231 (CDOP2_SG6_D5)
2.4	23.02.2015		Approved by SG in writing (23.02.2015; CDOP2_SG6_D9
Draft 2.5	02.04.2015	SAF/CM/DWD/SeSp	Included SeSp for the following data set: CM-12001 (CDOP2_SG7_D3); Added a section on uncertainty characterization (acc. to RR2.2 A1)
2.5	17.04.2015	SAF/CM/DWD/SeSp	Approved by SG CDOP2_SG7_D5 (17.04.2015)
Draft 2.6	01.09.2016	SAF/CM/DWD/SeSp	Include changes from OR 2016: changes for CM-14, CM-15, CM-16, CM-59

Issue/ Revision	Date	DCN No.	Changed Pages/Paragraphs
2.6	09.09.2016	SAF/CM/DWD/SeSp	Approved by SG (CDOP2_SG9_D18, 09.09.2016)
Draft 2.7	02.12.2016	SAF/CM/DWD/SeSp	Included SeSp for the CLAAS-2 CDR: CM-21011, CM-21021, CM-21031, CM-21041, CM-21051, CM-21061
2.7	14.12.2016	SAF/CM/DWD/SeSp	Approved by SG (CDOP2_SG10_D5)
Draft 2.8	20.01.2017	SAF/CM/DWD/SeSp	Included SeSp for the FCDR SMMR-SSMI-SSMIS (CM-12002). Included SeSp for CLARA-A2 (CM-11011, CM-11021, CM-11031, CM-11041, CM-11051, CM-11061, CM-11201, CM-11221, CM-11251, CM-11261) Included SeSp for TOA MVIRI/SEVIRI (CM-23311, CM-23341)
2.8	15.02.2017	SAF/CM/DWD/SeSp	Approved by SG (CDOP2_SG10_D9)

Distribution List

Internal Distribution	
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	No. Copies
PUBLIC	1

Applicable and Reference Documents

The predominant part of the CM SAF documents are so called 'living documents' meaning they will be updated in short intervals. The most current version of the documents can be found on the CM SAF pages: http://www.cmsaf.eu

Applicable Documents

Reference	Title	Code
AD 1	CM SAF Product Requirements Document	SAF/CM/DWD/PRD/1
AD 2	CM SAF Configuration Management Plan	SAF/CM/DWD/CMP/1
AD 3	Project and Operations Plan for CM SAF CDOP	SAF/CM/DWD/POP/1

Reference Documents

Reference	Title	Version	Code
RD 2	Product User Manual Water Vapour and Temperature from ATOVS	1.4	SAF/CM/DWD/PUM/WVT
RD 3	Product User Manual Clouds	1.8	SAF/CM/DWD/PUM/CLOUDS
RD 4	Product User Manual Surface Albedo	2.4	SAF/CM/FMI/PUM/SAL
RD.5	Product User Manual Surface Radiation	2.5	SAF/CM/DWD/PUM/SFCRAD
RD.6	Product User Manual Top of Atmosphere Radiation	1.2	SAF/CM/DWD/PUM/TOA
RD.7	Product User Manual Meteosat (MVIRI) Solar Surface Irradiance and effective Cloud Albedo Climate Data Sets	1.1	SAF/CM/DWD/PUM/MVIRI_HEL
RD.8	Product User Manual SSM/I data set (HOAPS release 3.2)	1.1	SAF/CM/DWD/PUM/HOAPS
RD.9	Product User Manual AVHRR GAC Cloud products Edition 1	1.2	SAF/CM/DWD/PUM/GAC/CLD
RD.10	Product User Manual AVHRR GAC Surface Albedo Edition 1	1.2	SAF/CM/FMI/PUM/GAC/SAL
RD.11	Product User Manual AVHRR GAC Surface Radiation Products Edition 1	1.2	SAF/CM/DWD/PUM/GAC/RAD/
RD.12	Product User Manual Fundamental Climate Data Record of SSM/I Brightness Temperatures	1.0	SAF/CM/DWD/PUM/FCDR_SSMI/
RD.13	Product User Manual: Meteosat (MVIRI) Meteosat (MVIRI) Solar Surface Irradiance and effective Cloud Albedo Data Sets. MVIRI_HEL	1.2	SAF/CM/DWD/PUM/MVIRI_HEL
RD 14	Product User Manual: SEVIRI cloud mask data set	1.1	SAF/CM/DWD/PUM/SEV/CLM

Reference	Title	Version	Code
RD 15	Product User Manual Meteosat Solar Surface Irradiance, and effective Cloud Albedo Climate Data records	1.1	SAF/CM/DWD/PUM/METEOSAT_HEL
RD 16	Product User Manual Fundamental Climate Data Record of SSM/I / SSMIS Brightness Temperatures	1.1	SAF/CM/DWD/PUM/FCDR/SSMIS
RD 17	Product User Manual SEVIRI cloud products Edition 2 (CLAAS-2)	2.1	SAF/CM/KNMI/PUM/SEV/CLD
RD 18	Product User Manual Fundamental Climate Data Record of SMMR / SSMI / SSMIS Microwave Imager Radiances	1.1	SAF/CM/DWD/PUM/FCDR_SMMR
RD 19	Product User Manual Top of Atmosphere Radiation MVIRI/SEVIRI Data Record	1.1	SAF/CM/RMIB/PUM/MET_TOA
RD 20	Product User Manual CM SAF Cloud, Albedo, Radiation data record, AVHRR-based, Edition 2 (CLARA-A2) Cloud Products	2.2	SAF/CM/DWD/PUM/GAC/CLD
RD 21	Product User Manual CM SAF Cloud, Albedo, Radiation data record, AVHRR-based, Edition 2 (CLARA-A2) Surface Radiation Products	2.1	SAF/CM/DWD/PUM/GAC/RAD
RD 22	Product User Manual CM SAF Cloud, Albedo, Radiation data record, AVHRR-based, Edition 2 (CLARA-A2) Surface Albedo Products	2.1	SAF/CM/FMI/PUM/GAC/SAL

Table of Content

Table of Figures

1. Introduction

1.1. Purpose of the document

The purpose of this document is to provide specifications and detailed information on the services committed towards the users by the Climate Monitoring Satellite Application Facility (CM SAF) for the currently operational processing version during the Continuous Development and Operations Phases (CDOP and CDOP-2). This document shall be made available to users. In this document the services for products from Version 3 at the beginning of the CDOP (available since 1 July 2007) onwards are described.
This document and any later issues of the document are subject to approval by the CM SAF Steering Group (SG). Any suggestions for improvements, to be incorporated into later issues, shall be proposed to the Steering Group and shall be based on the user's feedback mechanism as described later.

1.2. Definition of Terms

The following terms are used in this document and defined below.

"In development": Products or software packages that are in development and not yet available to users.

"**Demonstrational":** Products or software packages that are provided to users without any commitment on the quality or availability of the service, based on decision of the concerned SAF Steering Group to start dissemination to enable users to test these products and provide feedback.

"Pre-operational": Products or software packages with documented limitations that is able to satisfy the majority of applicable requirements and/or have been considered by the relevant Steering Group suitable for distribution to users.

"Operational": Products or software packages with documented non-relevant limitations that largely satisfy the requirements applicable and/or have been considered by the relevant Steering Group mature enough for distribution to users.

"Released" Data sets that are made available to users, satisfying largely the applicable requirements, with documented characteristics, validations results and limitations, and that are considered by the relevant Steering Group mature enough for the targeted applications.

"Superseded" Products or software packages that have been (pre-) operationally provided to users but are not (pre-) operational anymore **because the information of same or superior quality and/or coverage is provided with another product** and considered by the relevant Steering Group as not useful for being produced. Note, the "superseded" products remain available for the users.

"Discontinued" Products or software packages that have been previously (pre-) operationally provided to users but are not (pre-) operational anymore and are considered by the relevant Steering Group as not useful for further production. Note, the "discontinued" products remain available for the users.

"Deleted" Products or software packages that have been previously planned or (pre-) operationally provided to users but are not planned or (pre-) operational anymore and are considered by the relevant Steering Group as not useful to be provided to users.

1.3. Uncertainty characterisation

The CM SAF applies the following accuracy concept for its data set using three different metrics: **Mean error, Precision and Stability.**

These are defined as follows:

Mean error: This measure should tell how close the parameter estimation is on average to a reference observation (representing the truth). The quantity is often referred to as the bias but for some applications the mean of the absolute error is more appropriate. The definition of the truth depends on the variable and the availability of references.

Precision: This measure should tell how individual parameter estimations are distributed relative to the mean error. The quantity used is the standard deviation of the error which is equivalent to the bias-corrected RMS error.

Stability: This measure should tell whether one or several accuracy metrics are stable or if they are changing over time. The CM SAF has chosen to monitor only the first metric here (the mean error) where criteria have been defined for the maximum changes being acceptable per decade for each product.

2. CM SAF Service Architectures

This section describes the services architectures which are used in CM SAF to either provide operationally products or to generate climate data sets.

2.1. Service architecture for operational products

The service architecture of the two operational centres of the CM SAF at RMIB in Brussels and at DWD in Offenbach is shown in Figure 2.1 and Figure 2.2. In IV/2008- I/2009 the architecture of the processing centre at DWD changed. As depicted in Figure 2.1 the processing of the products is done at ECMWF. The Input and output services are provided at DWD. These changes do no have any influence on the services provided to the user.
The service architecture at RMIB in Brussels shown in Figure 2.2 is not only used to process the Environmental Data Records (EDRs) at the top of the atmosphere but also to generate TOA data sets.

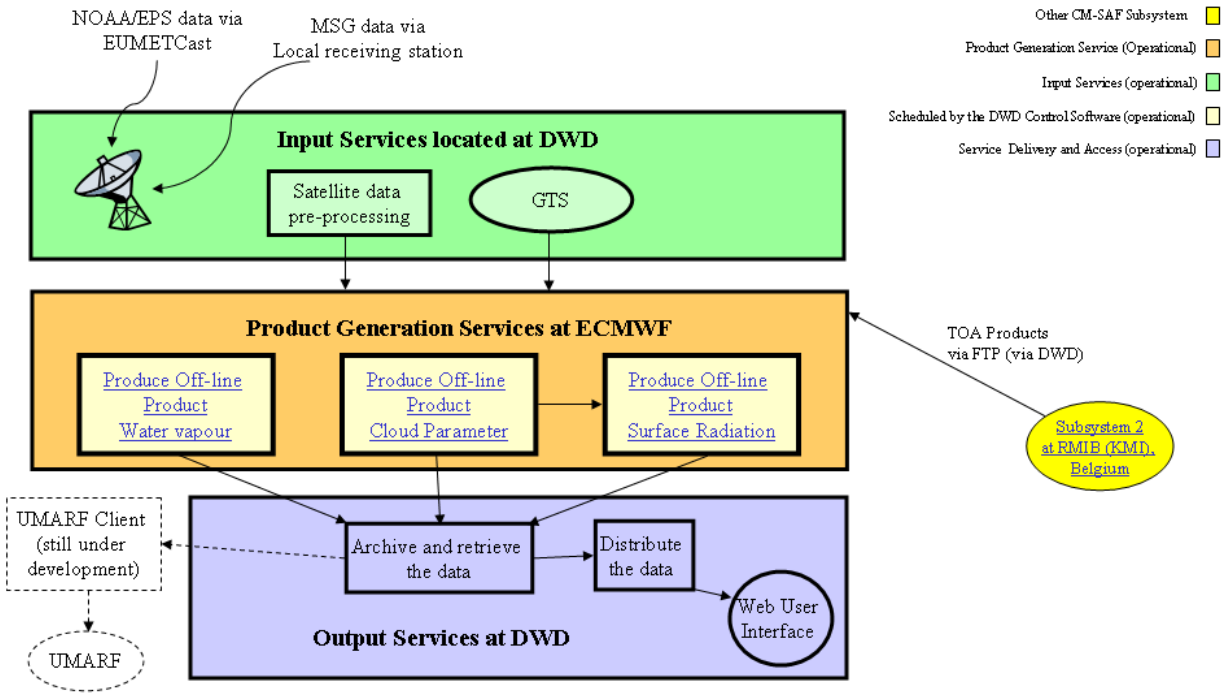

Figure 2.1: CM SAF Operational Service Architecture at DWD

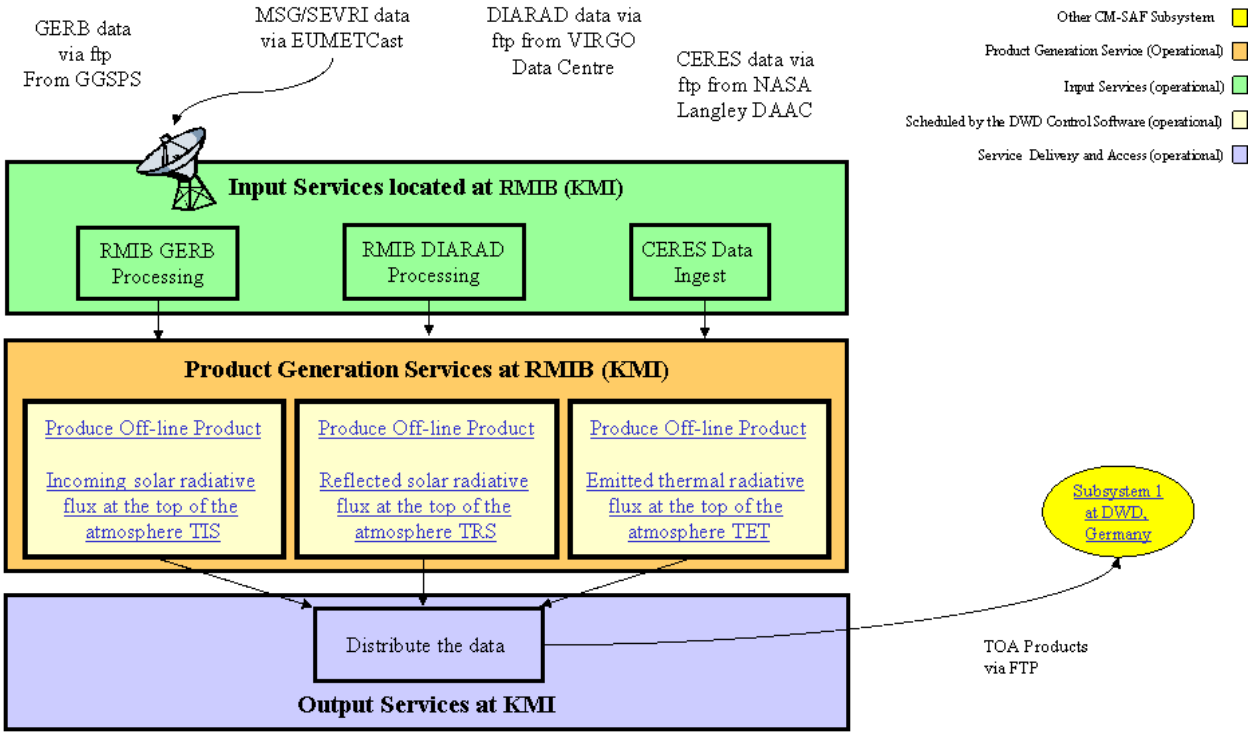

Figure 2.2: CM SAF Operational Service Architecture at RMIB

2.2. Architecture to generate the MVIRI surface radiation data sets

The corresponding system architecture to generate the MVIRI surface radiation data sets is presented in Figure 2.3.

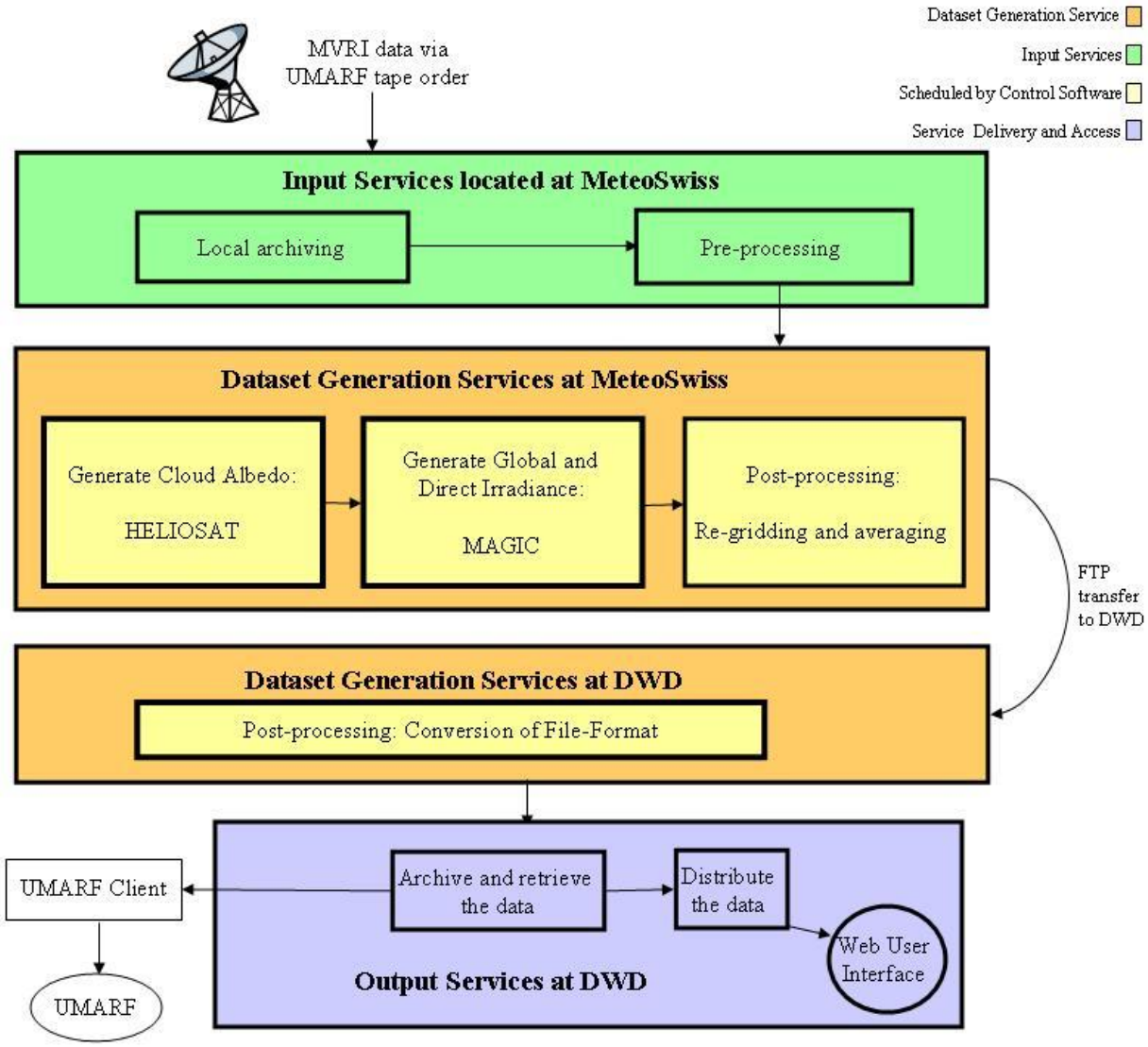

Figure 2.3: Architecture to generate surface radiation data sets based on MVIRI

2.3. Architecture to generate the HOAPS climate data set

The corresponding system architecture for the generation of the HOAPS climate data sets based on SSM/I measurements is presented in Figure 2.4.

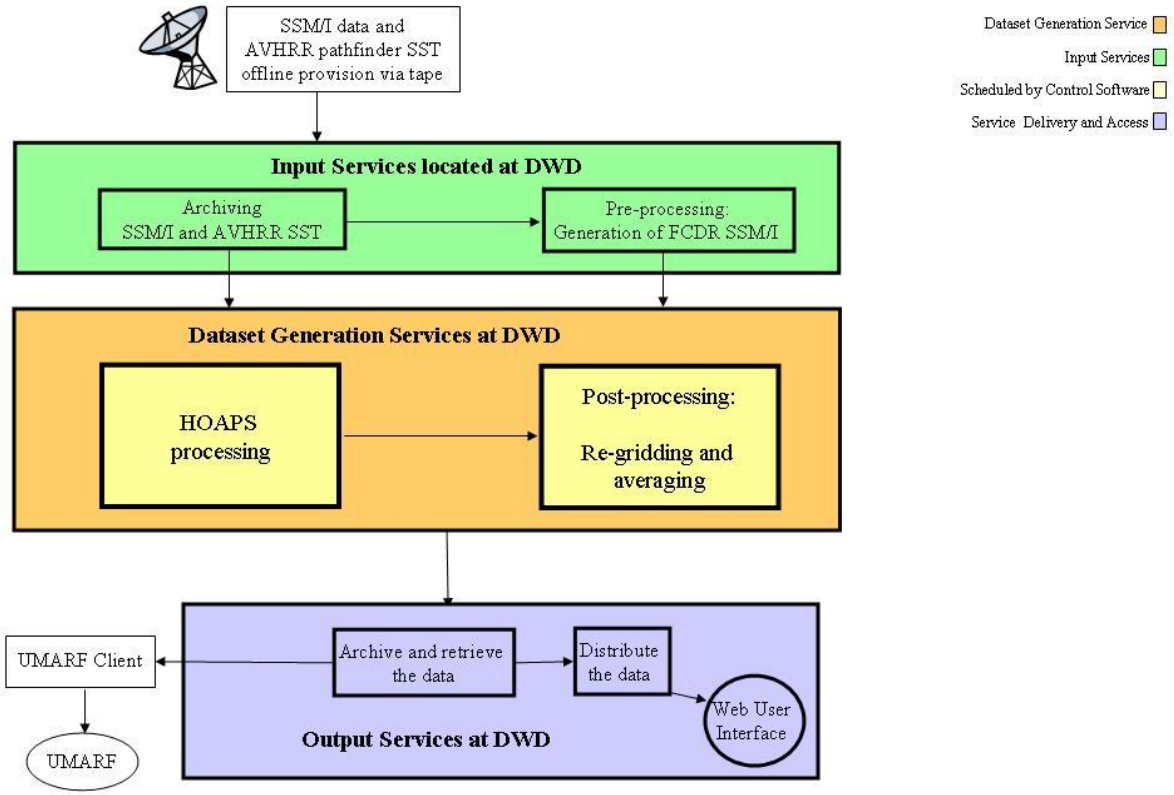

Figure 2.4: Architecture to generate the HOAPS climate data records.

2.4. Architecture to generate the AVHRR GAC (CLARA edition 1) climate data set

The generation of the AVHRR GAC (CLARA edition 1) climate data sets based on AVHRR GAC measurements is done using resources at DWD and ECMWF. The corresponding architecture is presented in Figure 2.5.

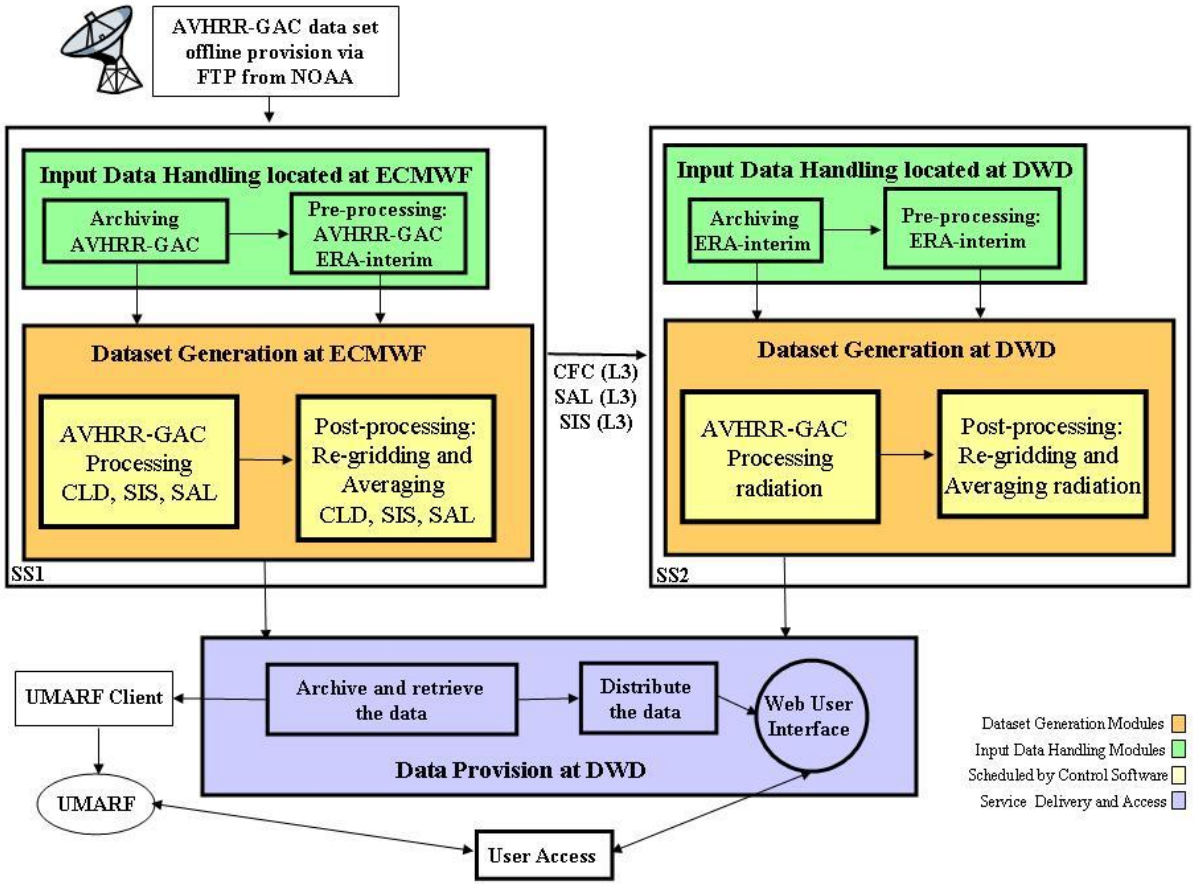

Figure 2.5: System architecture to generate the AVHRR-GAC (CLARA) climate data records.

2.5. Architecture to generate the FCDR SSMI

The generation of the Microwave FCDR data set for SSMI channels is done using resources at DWD. The architecture of the system used for the generation of this FCDR is shown in Figure 2.6.

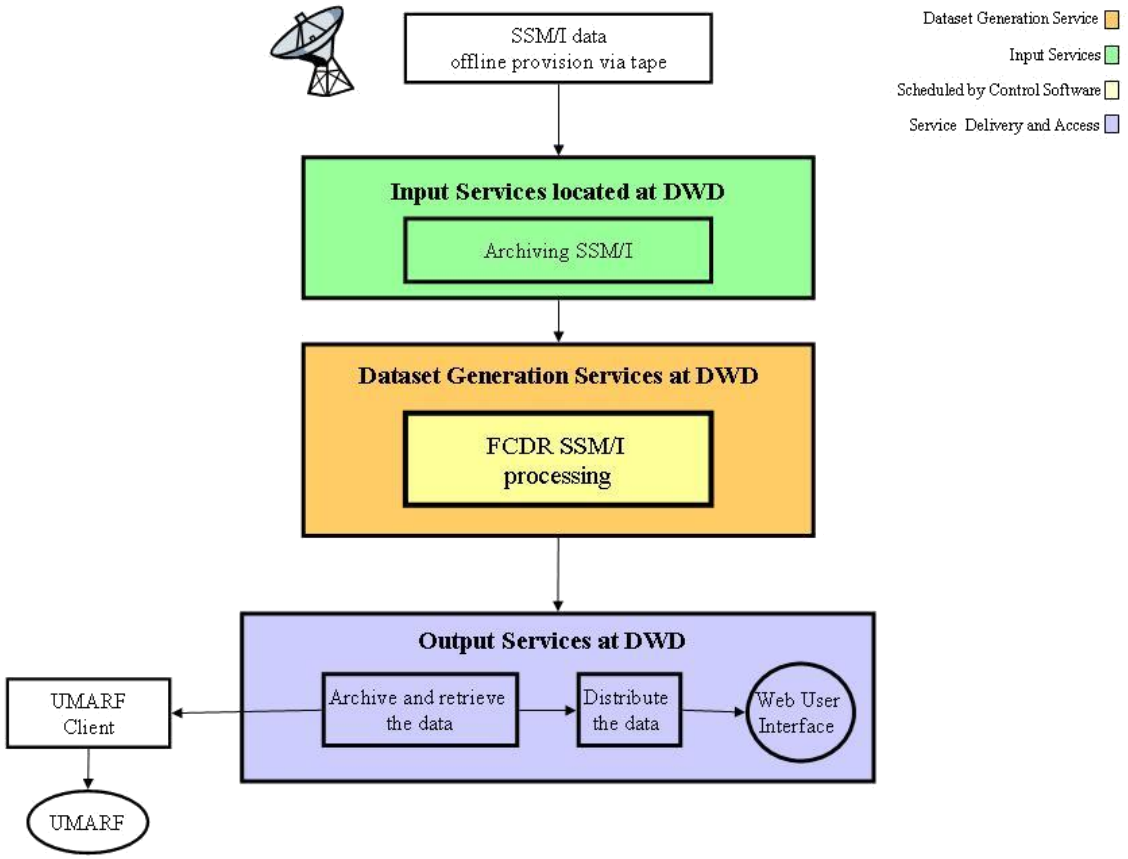

Figure 2.6: System architecture to generate the FCDR SSM/I data set.

2.6. Architecture to generate the GERB climate data set

The generation of the GERB climate data set based on METEOSAT GERB measurements is done using resources at RMIB. The corresponding architecture is presented in Figure 2.7.

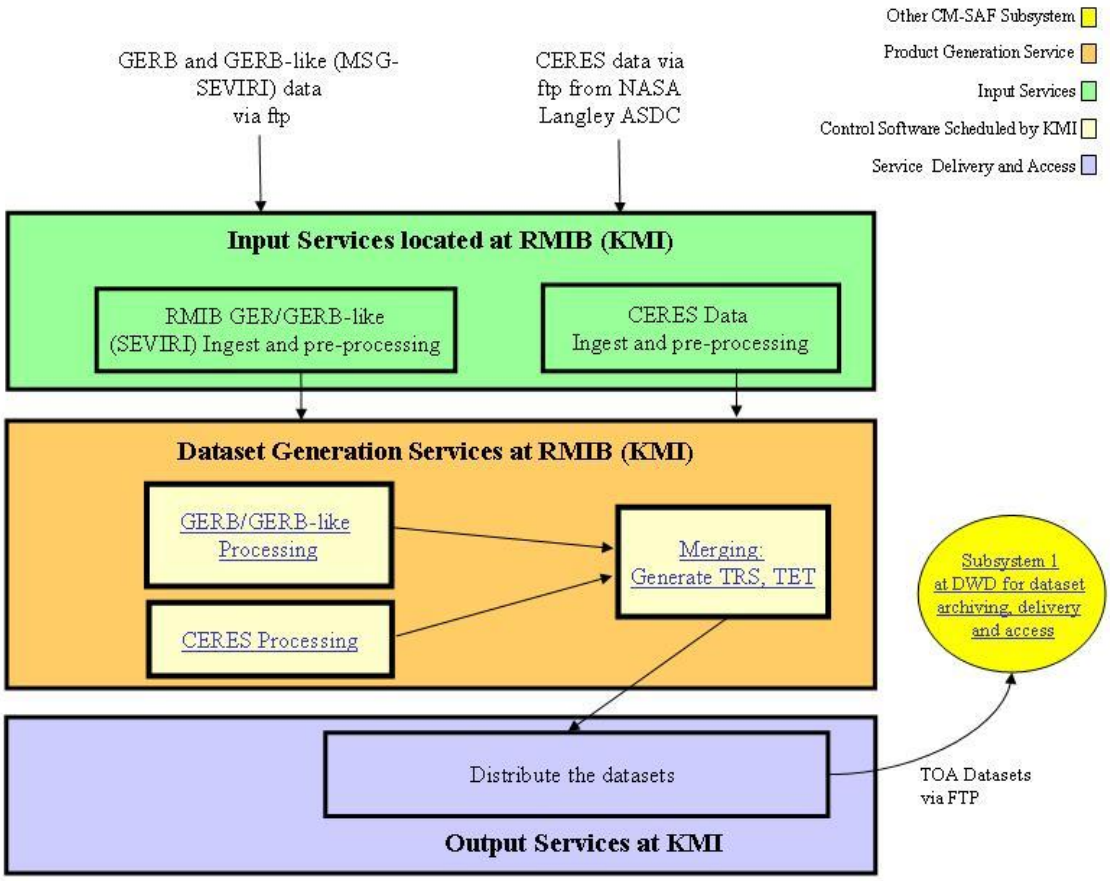

Figure 2.7: System architecture to generate the the GERB climate data set.

2.7. Architecture to generate the ATOVS climate data set

The generation of the ATOVS climate data set based on NOAA ATOVS measurements is done using resources at DWD and ECMWF. The corresponding architecture is presented in Figure 2.8.

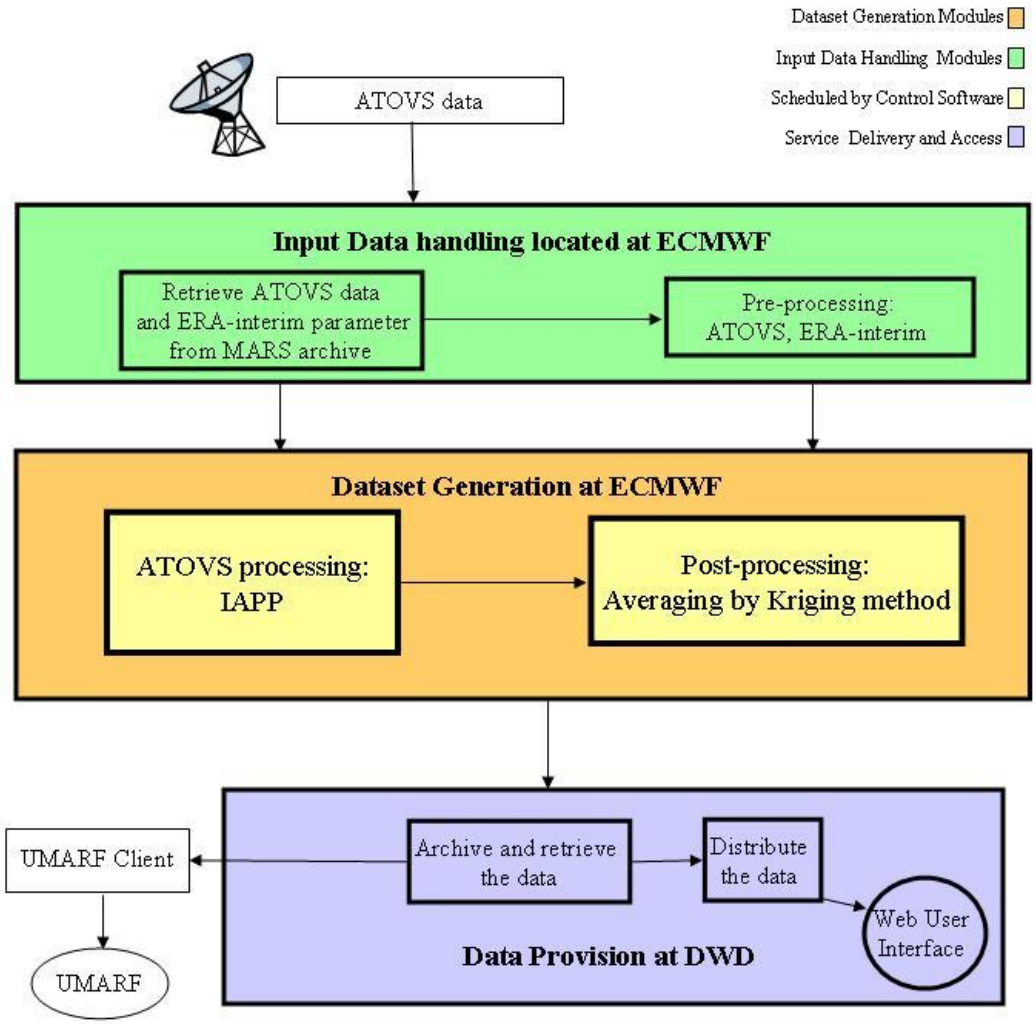

Figure 2.8: System architecture to generate the ATOVS climate data set.

2.8. Architecture to generate the FTH climate data set

The generation of FTH climate data set based on METEOSAT SEVIRI and MVIRI measurements is done using resources at DWD. The corresponding architecture is presented in Figure 2.9.

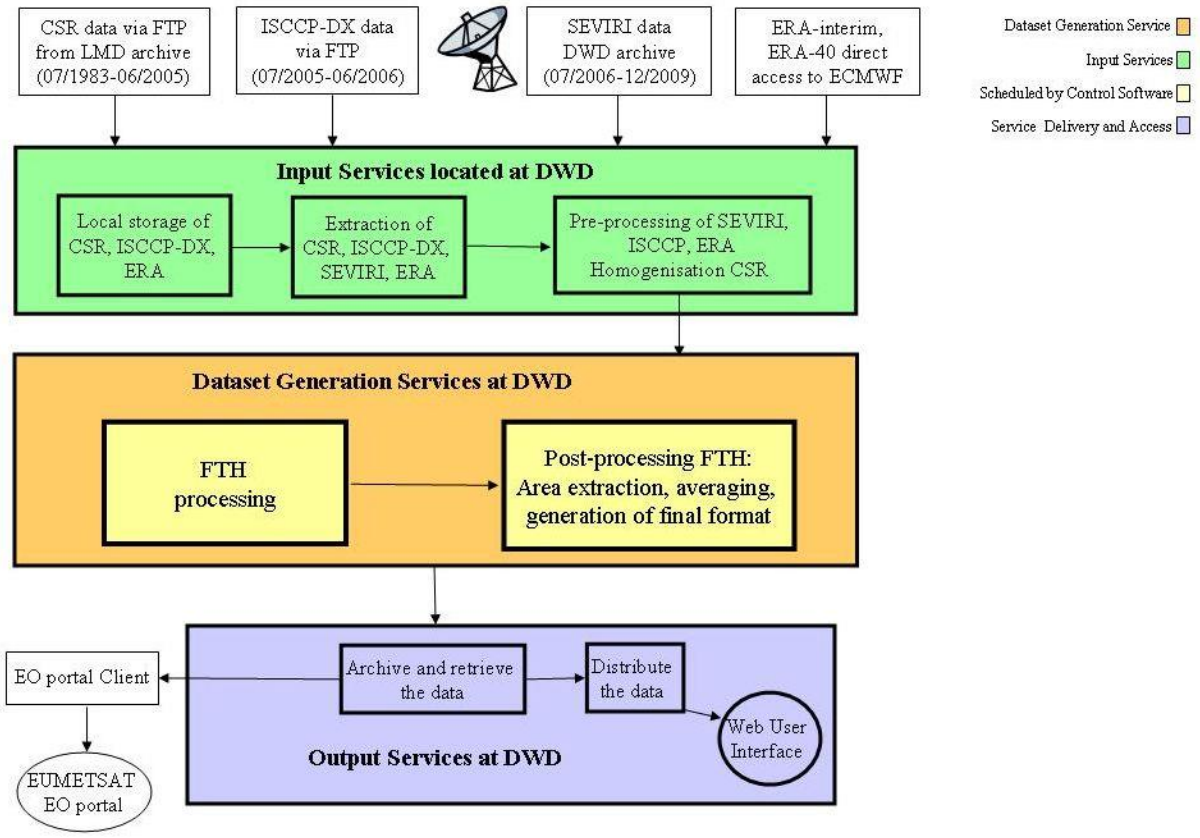

Figure 2.9: System architecture to generate the FTH climate data set.

2.9. Architecture to generate the SEVIRI CLAAS data set

The generation of the SEVIRI CLAAS data sets and the high resolved SEVIRI cloud mask data set based on METEOSAT SEVIRI measurements is done using resources at DWD and ECMWF. The corresponding architecture is presented in Figure 2.10.

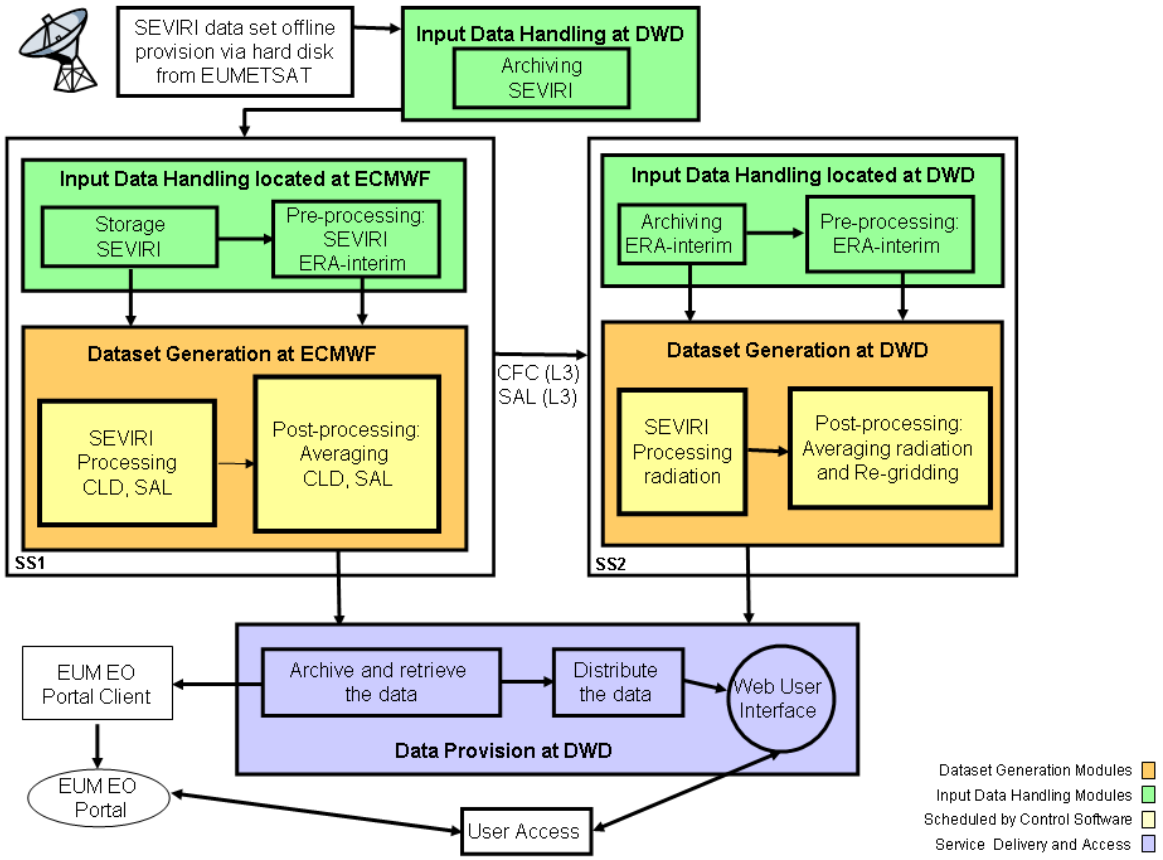

Figure 2.10: System architecture to generate the SEVIRI CLAAS data set and the SEVIRI cloud mask data set.

2.10. Architecture to generate the SARAH radiation data set

The generation of the SARAH radiation data set based on METEOSAT MVIRI and SEVIRI measurements is done using resources at DWD. The architecture of the system used for the generation of the SARAH radiation data set is.shown in Figure 2.11.

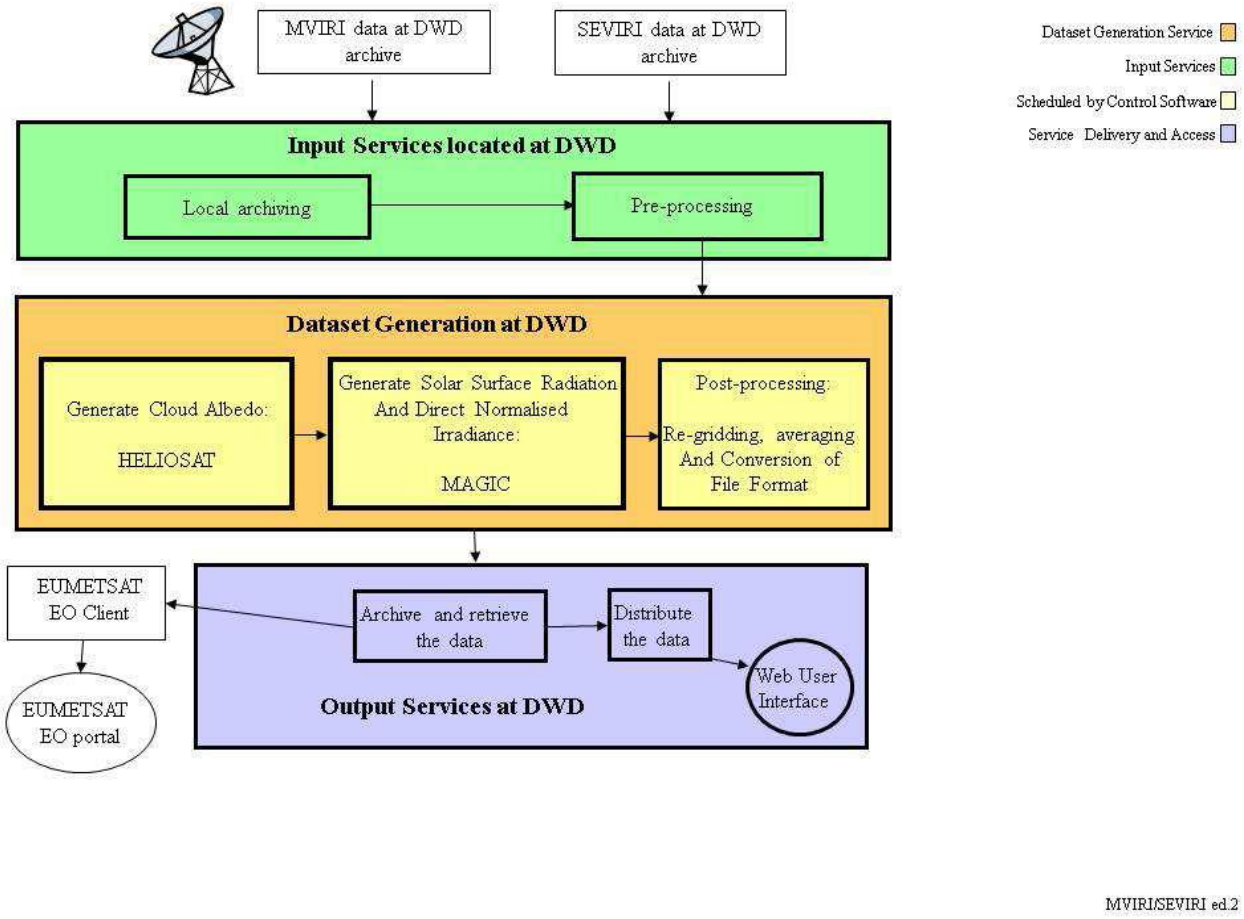

Figure 2.11: System architecture to generate the SARAH radiation data set.

2.11. Architecture to generate the FCDR SSMI + SSMIS

The generation of the Microwave FCDR data set for SSMI and SSMIS channels is done using resources at DWD. The architecture of the system used for the generation of this FCDR is shown in Figure 2.12.

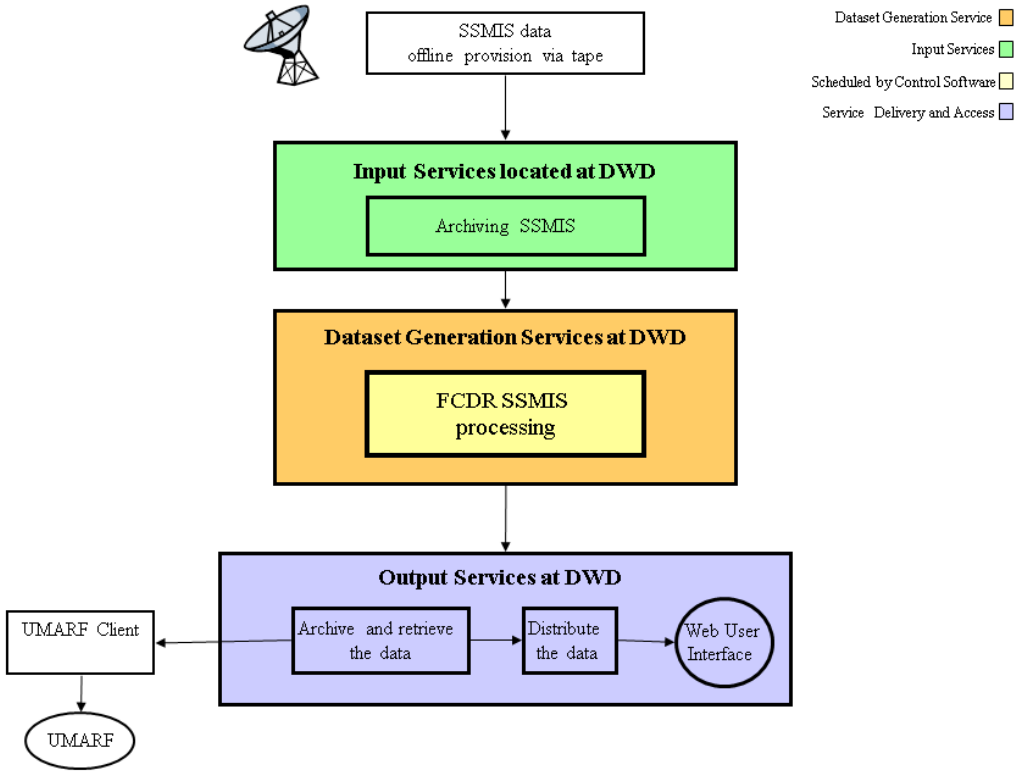

Figure 2.12: System architecture to generate the FCDR SSM/I + SSMIS data set.

2.12. Architecture to generate the CLAAS-2 CDR

The generation of the CLAAS-2 CDR from SEVIRI channels is done using resources at DWD and the ECMWF. The architecture of the system used for the generation of this CDR is shown in Figure 2.13.

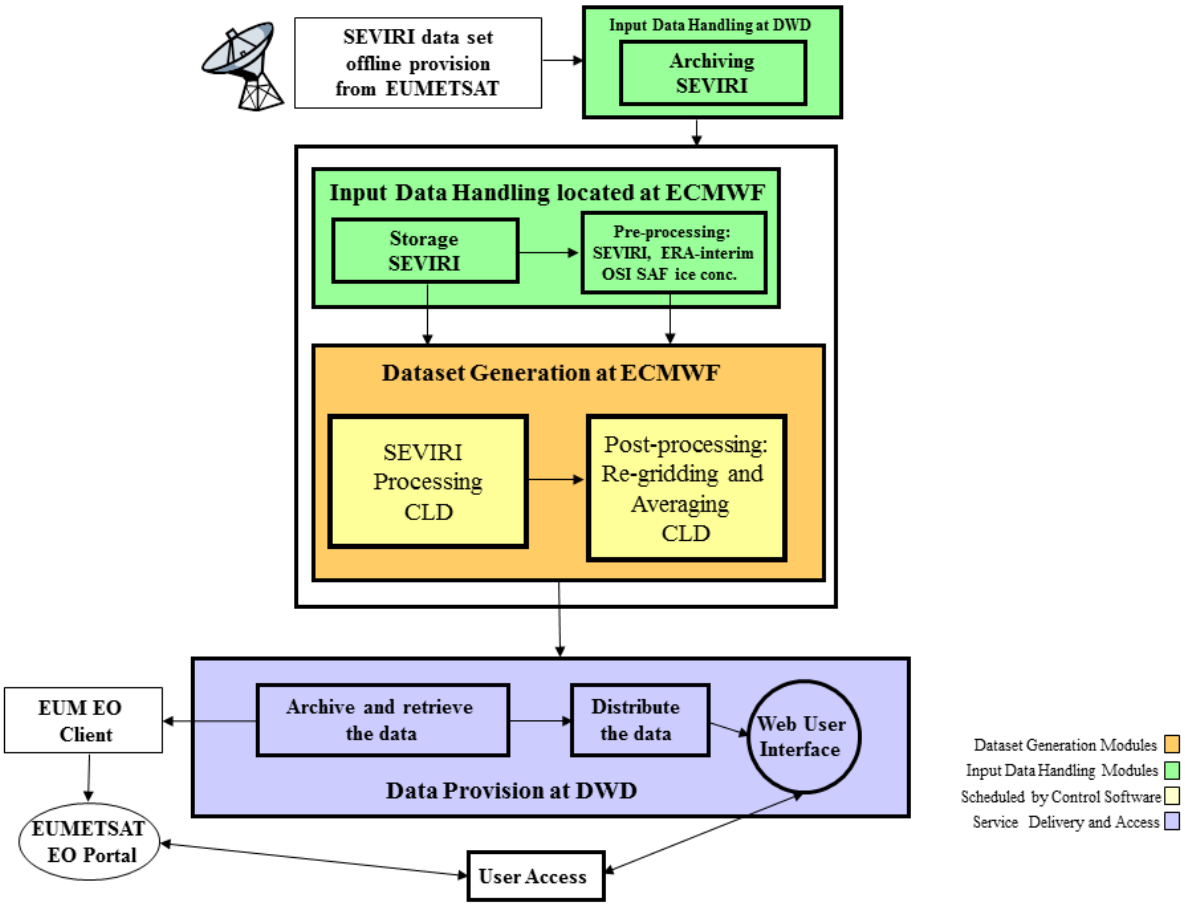

Figure 2.13: System architecture to generate the CLAAS-2 CDR.

2.13. Architecture to generate the FCDR Microwave Imager Radiances

The generation of the Microwave FCDR data set for SMMR, SSMI and SSMIS channels is done using resources at DWD. The architecture of the system used for the generation of this FCDR is shown in Figure 2.14.

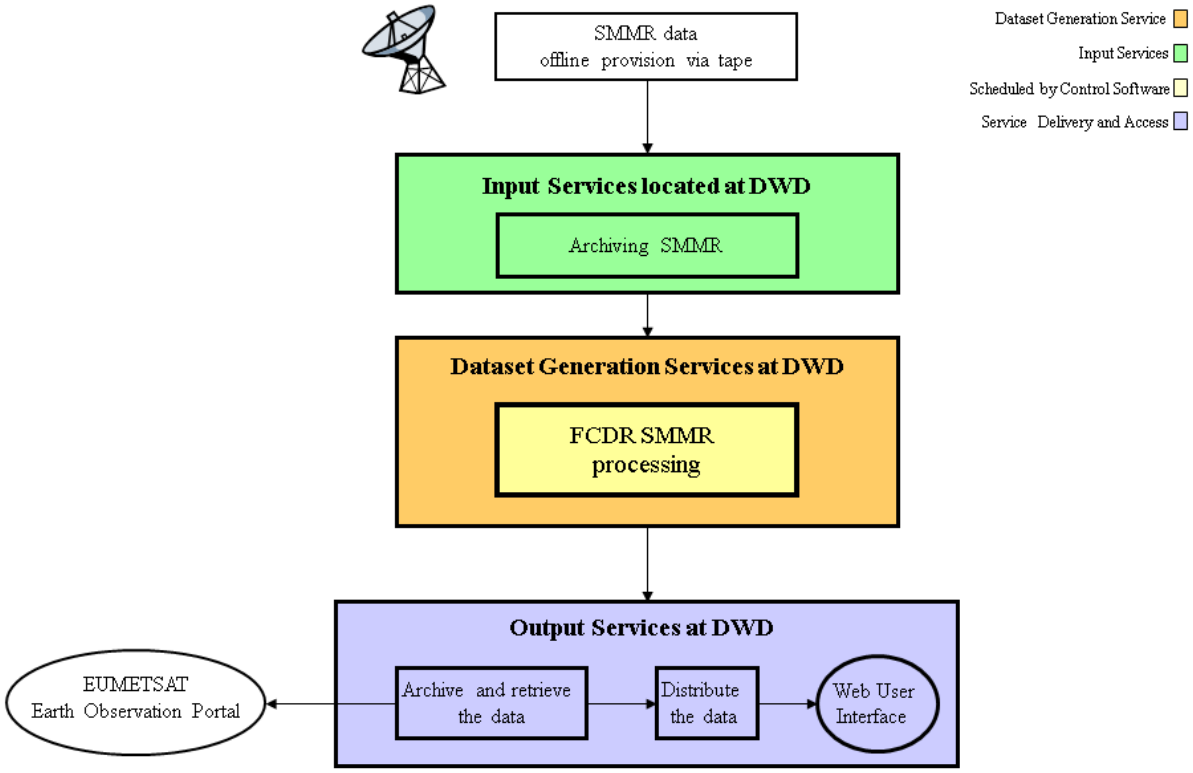

Figure 2.14: System architecture to generate FCDR Microwave Imager Radiances.

2.14. Architecture to generate the Top of Atmosphere Radiation MVIRI/SEVIRI

The generation of the Top of Atmosphere Radiation set based on METEOSAT MVIRI/SEVIRI measurements is done using resources at RMIB. The architecture of the system used for the generation of this CDR is shown in Figure 2.15

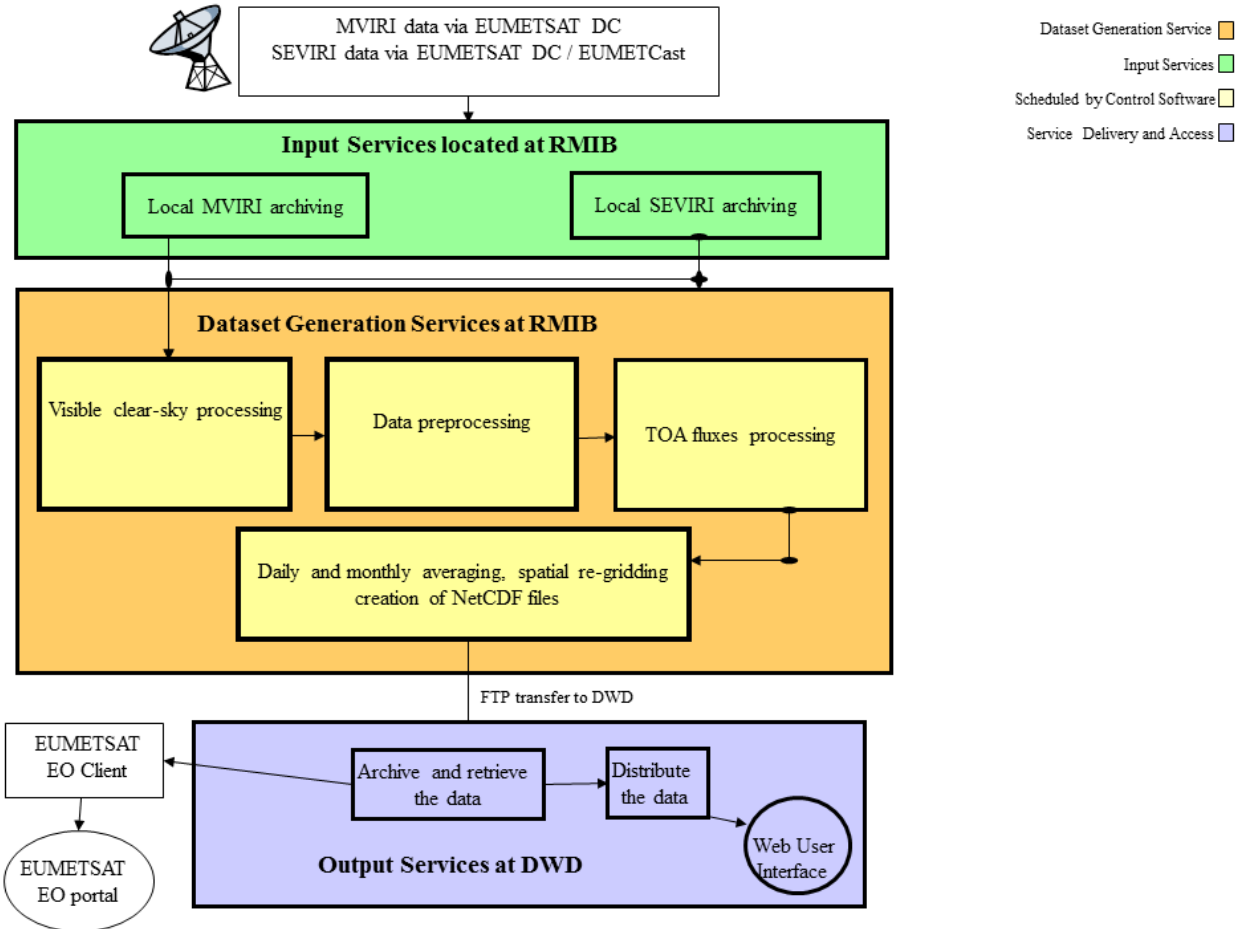

Figure 2.15: System architecture to generate Top of the atmosphere radiation budget MVIRI/SEVIRI.

2.15. Architecture to generate the AVHRR GAC (CLARA A2)

The generation of the AVHRR GAC (CLARA edition 2) climate data sets based on AVHRR GAC measurements is done using resources at DWD and ECMWF. The corresponding architecture is presented in Figure 2.16.

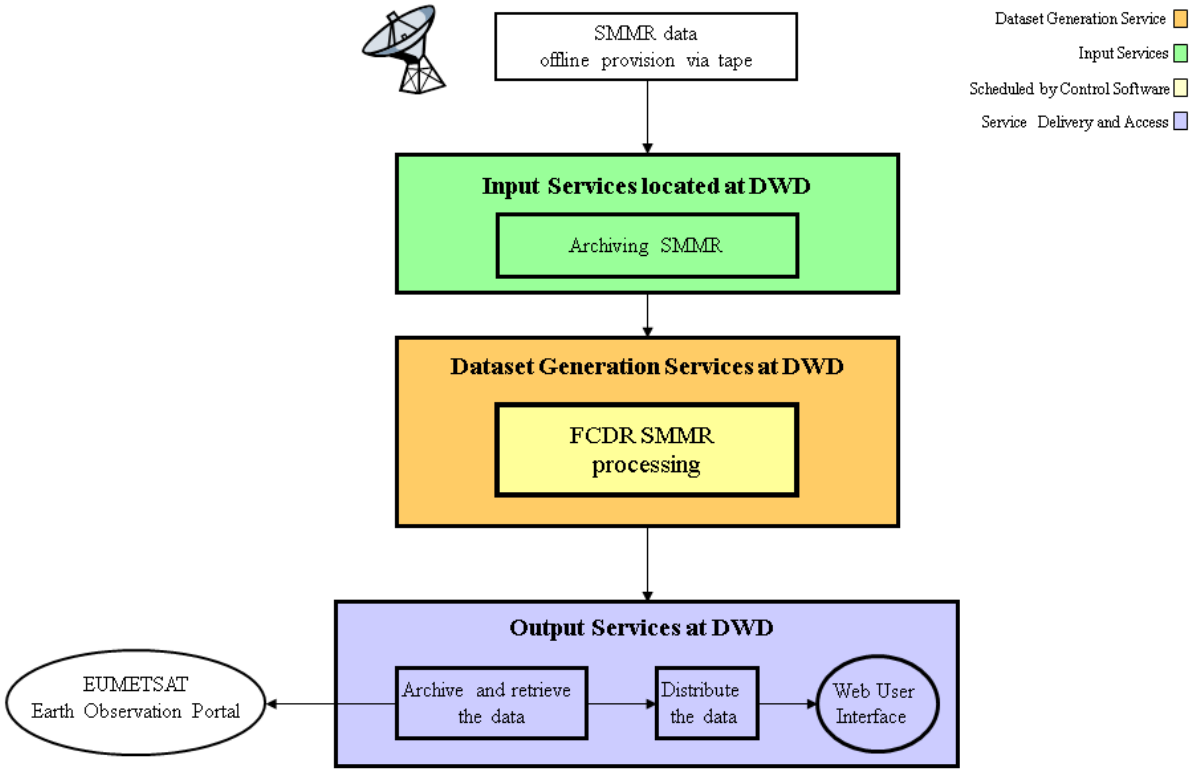

Figure 2.16: System architecture to generate AVHRR GAC (CLARA-A2).

3. Products

3.1. Scope

SS-1 According to schedule, the CM SAF shall provide users with the products listed in Annex 2

3.2. Area

SS-2 The areas of these products are defined in Annex 2 (cp. Column “spatial coverage”

3.3. Product characteristics and accuracy

SS-3 The main characteristics of each product are described in the product requirement table (Annex 2). :

3.4. Product availability

SS-4 The availability of each product is described in the product requirement table (Annex 2), cp. Column “Timeliness” and “Availability”). :

4. User Service

4.1. Operations Report

SS-5 For the CM SAF operational product, the results of availability and quality control shall be reported in a CM SAF half-yearly Operations Report

4.2. CM SAF archive

SS-6 The CM SAF products shall be archived at DWD and shall be made available to users.

4.3. Processing of requests

SS-7 Requests from users for CM SAF archive products shall be processed during normal working hours. The user shall receive an answer to the request within one working day. The products shall be available to the user within 5 working days. In case of problems the user shall get a message about the delay.

4.4. User information

SS-8 The CM SAF shall provide the current status of user requests and problems to the users. The user shall receive information on the status of requests and problems during normal working hours. Information will be sent to the user within one working day.

4.5. Product distribution

SS-9 The CM SAF products shall be delivered to users on common media as product files on the DWD-FTP server, CD-ROM, DVD-ROM, and email.

SS-10 To get access to the data, a single entry point for searching and ordering of products (Web User Interface, WUI) from the CM SAF main page shall be provided.

SS-11 The user shall have access to the product catalogue to check the availability of the products. Additionally, example images of the products shall be provided.

SS-12 The user shall be able to place orders and to get status information of already placed orders.

SS-13 The registration and login of the user shall be mandatory to order CM SAF products.

SS-14 The user shall get a confirmation of the committed order via e-mail and shall receive another e-mail once the data have been prepared.

4.6. Training Workshop

SS-15 The CM SAF **shall** prepare and perform 'CM SAF User and Training Workshops'.

4.7. Help Desk and User Problem Reports

SS-16 The Help Desk User Support **shall** be based on a dedicated CM SAF web site, which will act as the single entry point for the web users interface (WUI). When ordering products the users will gain access by means of a password. The Help Desk intends to provide information and services to CM SAF users, as well as to support the gathering of the feedback from users needed to improve the CM SAF services. Therefore, a template for a user's problem report (UPR) shall be available on the web site in order for a user to depict the problems he/she has with the CM SAF products, CM SAF operation or suggestions for improvements of the CM SAF system. The user shall receive a feedback on any problem that he/she has reported. He/she shall receive an answer to the request within one working day.

4.8. Help Desk full availability

SS-17 The CM SAF **shall** provide sufficient manpower for ensuring a full availability of the Help Desk, based on working hours, five days a week service. Besides email the CM SAF Help Desk shall be accessible via mail and telephone.

4.9. Availability of CM SAF web page

SS-18 The central CM SAF WWW site shall be an operational element of the CM SAF, with a maximum of one interruption per week and with an interruption time of one working day as a maximum.

4.10. Provision of User Service

SS-19 User services shall be provided through the CM SAF homepage www.cmsaf.eu. The user service shall include information and documentation about the CM SAF and the CM SAF products, information on how to contact the user help desk and shall allow to search the product catalogue and to order products.

4.11. Mail Box and FAQ List

SS-20 The CM SAF **shall** provide the following mail box and FAQ (Frequently Asked Questions) list facility:

- Email-Box to the CM SAF users, to solve minor problems or to collect user's questions and requirement proposals (contact.cmsaf@dwd.de).
- Regularly updated FAQ list covering all aspects related to the CM SAF: access to products, products quality, performance, etc.

4.12. Functions of the central CM SAF WWW site

SS-21 The central CM SAF WWW site for the CM SAF shall provide the following functions :

- **General information:**
  - CM SAF overview
  - Product description and examples
  - Links to production centres web sites, information on the quality of the products and quick looks, and relevant scientific information
- **News :** general announcement (product modifications, next seminars and workshops, Visiting Scientists activities, etc.), a form for the UPR (User's Problem Report)
- **Links** to other web sites (Meteorological Institutes, EUMETSAT, etc.)
- **Web User Interface** (WUI) which allows the user access to the products via an identification procedure
- **Help desk service, contact and Frequently Asked Questions** (**FAQs**)
- **Service messages:** operational information (product unavailability, detected or expected anomalies, warnings etc.)
- **Log of changes**
- **CM SAF documents and reports**

4.13. Access rights

SS-22 The above central CM SAF WWW site services shall be accessible to the general public. The access to CM SAF products entails detailed user registration

4.14. News and other topics

SS-23 On its web pages the CM SAF **shall** provide to the users news and other topics on SAF on Climate Monitoring based on the following services

- General Information on the CM SAF
- Hot Topics
- Log of Changes
- Advertising of VS Activities
- Any additional services giving information on climate aspects
- UPR template

4.15. Documentation Access

SS-24 The CM SAF **shall** provide a documentation access capability to view and download the following material:

- CM SAF product user manuals (PUM)
- CM SAF Algorithm Theoretical Basis Document (ATBD)
- CM SAF Validation Reports
- CM SAF Operations Reports (Ors)
- Download facility for other documentation relevant to users of the CM SAF products;
- Download training material of workshops
- SPR and SMR history

4.16. Scientific Developments

SS-25 On its web pages the CM SAF **shall** provide information on the scientific developments (e.g., papers published of CM SAF science team)

4.17. User Service quality monitoring

SS-26 The CM SAF **shall** continuously monitor the quality of the User Service in order to enable continuous improvements. The following parameters shall be taken into consideration:

- Problems reported by users and related to the User Service,
- Compliance in solving or replying to user's problems in requested time,
- Any potential useful metric value provided by the Leading Entity.

5. List of TBDs and TBCs

None

6. References

Kato, S., Ackerman, T., Mather, J., Clothiaux, E., 1999. The k-distribution method and correlated-k approximation for a short-wave radiative transfer. J. Quant. Spectrosc. Radiat. Transfer 62.

Annex 1 Definitions, acronyms and abbreviations

AVHRR	Advanced Very High Resolution Radiometer
CM SAF	EUMETSAT Satellite Application Facility on Climate Monitoring
CDOP	Continuous Development and operational phase
CDR	Climate Data Records
CLARA	CM SAF cLoud, Albedo & RAdiation dataset - AVHRR-based
DWD	Deutscher Wetterdienst
EDR	Environmental Data Record
FCDR	Fundamental Climate Data Record
GAC	Global Area Coverage
HOAPS	Hamburg Ocean Atmosphere Parameter Set
LE	Leading Entity
MSG	Meteosat Second Generation
MVIRI	Meteosat Visible and IR imager
NCR	Non-Conformance Report
PUM	Product User Manual
PRD	Product Requirements Document
RMIB	Royal Meteorological Institute of Belgium
SG	Steering Group
SS	Service Specification
SSM/I	Special Sensor Microwave Imager
TBC	To Be Confirmed
TBD	To be done/defined
UPR	User’s Problem Report
VS	Visiting Scientist

Annex 2 Service Specification Tables

The table entries under “Accuracy” represent the uncertainty of the products when compared to another similar product deduced from ground-based or satellite observations. They are determined with respect to previous validation results to high quality comparison data. As the comparison data used for quality monitoring in Operational Reviews must fulfill also temporal and spatial coverage requirements the comparison data are not necessarily of a very high accuracy. Thus, for most of the products the given uncertainty is between the threshold and target accuracies defined in the Product Requirements Document [AD 1].

CM-02	Fractional Cloud Cover	CFC_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments	The accuracy is defined as the mean error (i.e., defined in % cloud amount units) and precision is defined as the bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
±10% (cloud amount units) ±15% over oceanic and tropical (±15° N and S) regions For viewing angles > 70° accuracy will be lower.	
Verification method	Comparisons to SYNOP data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		2 month

CM-03	Fractional Cloud Cover	CFC_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean	
Comments	The accuracy is defined as the mean error (i.e., defined in % cloud amount units) and precision is defined as the bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
±10% (cloud amount units) ±15% over oceanic and tropical (±15° N and S) regions For viewing angles > 70° accuracy will be lower.	
Verification method	Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-04	Fractional Cloud Cover	CFC_AVHRR_Arctic
Type	Product	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	The accuracy is defined as the mean error (i.e., defined in % cloud amount units) and precision is defined as the bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
±30% (absolute)	
Verification method	Primarily comparisons with SYNOP but complemented with consistency checks against MODIS and Cloudsat/CALIPSO datasets - possibly complemented with comparison to ARM site data and IPY observations

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Arctic	(15 km)^2		2 month

CM-08	Cloud Type	CTY_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments	The Accuracy is defined as the Mean error (i.e., defined in % cloud amount units – where CTY is given as the contribution to CFC) and precision is defined as the Bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
±30% bias (cloud amount units) for all five main cloud groups. For viewing angles > 70° accuracy will be lower.	
Verification method	Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ^{2}		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-09	Cloud Type	CTY_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean	
Comments	The Accuracy is defined as the Mean error (i.e., defined in % cloud amount units – where CTY is given as the contribution to CFC) and precision is defined as the Bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
±30% bias (cloud amount units) for all five main cloud groups. For viewing angles > 70° accuracy will be lower.
Verification method: Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) [2]		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-10	Cloud Type	CTY_AVHRR_Arctic
Type	Product	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	The Accuracy is defined as the Mean error (i.e., defined in % cloud amount units – where CTY is given as the contribution to CFC) and precision is defined as the Bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
±30% (absolute)	
Verification method	

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Arctic	(15 km)^2		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-14	Cloud Top	CTO_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean and Monthly Mean Diurnal Cycle for: Cloud Top Temperature (CTT) Cloud Top Height (CTH) Cloud Top Pressure (CTP)	
Comments	The Accuracy is defined as the Mean error and precision is defined as the Bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
CTP: ±190 hPa (bias) No specific requirement set for CTT and CTH as they represent the same information in different unit.
Verification method: Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		2 month

CM-15	Cloud Top	CTO_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean and Monthly Mean for: Cloud Top Temperature (CTT) Cloud Top Height (CTH) Cloud Top Pressure (CTP)	
Comments		
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
CTP: ± 100 hPa (bias) No specific requirement set for CTT and CTH as they represent the same information in different unit.
Verification method: Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-16	Cloud Top	CTO_AVHRR_Arctic
Type	Product	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Contains: Daily Mean and Monthly Mean for: Cloud Top Temperature (CTT) Cloud Top Height (CTH) Cloud Top Pressure (CTP)	
Comments	The Accuracy is defined as the Mean error and precision is defined as the Bias-corrected RMS error.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
CTP ±100 hPa.No specific requirement set for CTT and CTH as they represent the same information in different unit.
Verification method: Comparisons to MODIS data (results computed as areal means over the studied area)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Arctic	(15 km)^2		2 month

CM-32	Cloud Optical Thickness	COT_SEVIRI
Type	Product	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments	The bias and rms are defined for the Meteosat disk as relative difference to the comparative datasets.	
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
bias: 40% rms: 70%
Verification method: Comparisons to MODIS data

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ^{2}		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-33	Cloud Optical Thickness		COT_AVHRR_Europe
Type	Product		
Applications and users	* Climate Research * NMHSs * Government agencies		
Characteristics and Methods	Daily Mean, Monthly Mean		
Comments	The bias and rms are defined for the baseline area as relative difference to the comparative datasets.		
Generation frequency	1 day, 1 month		
Input satellite data	AVHRR		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
bias: 40% rms: 70%			
Verification method	Comparisons to MODIS data		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-36	Cloud Phase		CPH_SEVIRI
Type	Product		
Applications and users	* Climate Research * NMHSs * Government agencies		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle		
Comments	The bias and rms are defined for the Meteosat disk as absolute difference (of water cloud fraction) to the comparative datasets.		
Generation frequency	1 day, 1 month		
Input satellite data	SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
bias: 0.1 rms: 0.2			
Verification method	Comparisons to MODIS data		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-37	Cloud Phase		CPH_AVHRR_Europe
Type	Product		
Applications and users	* Climate Research * NMHSs * Government agencies		
Characteristics and Methods	Daily Mean, Monthly Mean		
Comments	The bias and rms are defined for the baseline area as absolute difference (of water cloud fraction) to the comparative datasets.		
Generation frequency	1 day, 1 month		
Input satellite data	AVHRR		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
bias: 0.1 rms: 0.2			
Verification method	Comparisons to MODIS data		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-41	Liquid Water Path		LWP_SEVIRI
Type	Product		
Applications and users	* Climate Research * NMHSs * Government agencies		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle		
Comments	The bias and rms are defined for the Meteosat disk as relative difference to the comparative datasets.		
Generation frequency	1 day, 1 month		
Input satellite data	SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
bias: 40% rms: 70%			
Verification method	Comparisons to MODIS data		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-42	Liquid Water Path	LWP_AVHRR_Europe
Type	Product	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean, Monthly Mean	
Comments	The bias and rms are defined for the baseline area as relative difference to the comparative datasets.	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
bias: 40% rms: 70%
Verification method: Comparisons to MODIS data

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-49	Surface incoming shortwave radiation	SIS_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments		
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy
90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means. Bias of 20 W/m² for daily means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.
Verification method: comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		2 month

CM-50	Surface incoming shortwave radiation	SIS_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean	
Comments	due to the lower resolution in space-time, the daily means have a lower accuracy than the MSG based product	
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination

Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy

90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means.
Bias of 20 W/m² for daily means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.

Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-51	Surface incoming shortwave radiation	SIS_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged product Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI/GERB, AVHRR	

Dissemination

Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy

10 W/m² monthly mean, for details see components

Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk and Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-56	Surface Albedo		SAL_SEVIRI
Type	Product		
Applications and users			
Characteristics and Methods	Weekly Mean, Monthly Mean		
Comments			
Generation frequency	1 week, 1 month		
Input satellite data	SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
25% (relative). Higher deviations in desert regions are expected.			
Verification method	Continuous validation at mast measurement sites & field campaigns. Comparisons over Africa are very limited due to missing mast data. Comparisons to other satellite data are attempted. It is expected that the quality of SAL is not reduced except in desert regions.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-57	Surface Albedo		SAL_AVHRR_Europe
Type	Product		
Applications and users			
Characteristics and Methods	Weekly Mean, Monthly Mean		
Comments			
Generation frequency	1 week, 1 month		
Input satellite data	AVHRR		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
25% (relative). Higher deviations in desert regions are expected.			
Verification method	Continuous validation at mast measurement sites & field campaigns		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-58	Surface Albedo	SAL_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged Product, Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI, AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	Offline

Accuracy	
25% (relative). Higher deviations in desert regions are expected.	
Verification method	Continuous validation at mast measurement sites & field campaigns of the components CM-57 and CM-56.

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-59	Surface Albedo	SAL_AVHRR_Arctic
Type	Product	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Weekly Mean Monthly Mean	
Comments	Per definition is this product only available from April to September	
Generation frequency	1 week, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
25 % (relative)	
Verification method	continuous validation at mast measurement sites & field campaigns

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Arctic	(15 km)^2		2 month

CM-64	Surface Net Shortwave Radiation	SNS_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments		
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m² 25 W/m² daily mean, see components for details	
Verification method	calculated based on accuracy of SAL and SIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-65	Surface Net Shortwave Radiation	SNS_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean	
Comments		
Generation frequency	1 day, 1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m² 30 W/m² daily mean, see components for details	
Verification method	calculated based on accuracy of SAL and SIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		2 month

CM-66	Surface Net Shortwave Radiation	SNS_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged product Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI, AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m² monthly mean, see components for details.	
Verification method	calculated based on accuracy of SAL and SIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-71	Surface Outgoing Longwave Radiation	SOL_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean, Monthly Mean Diurnal Cycle	
Comments		
Generation frequency	1 month	
Input satellite data	NWP (SEVIRI)	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-72	Surface Outgoing Longwave Radiation	SOL_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	NWP (AVHRR)	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-73	Surface Outgoing Longwave Radiation	SOL_merged
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	NWP (SEVIRI, AVHRR)	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
10 W/m² monthly mean, for details see components	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-78	Surface Downward Longwave Radiation	SDL_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean, Monthly Mean Diurnal Cycle	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.	
Verification method	Comparison with in-situ measurements. Only a few reliable operational in-situ measurements are available in Africa. The target accuracy is based on the comparison at available stations and is not necessarily valid everywhere in Africa. However, it is not expected that the quality is greatly reduced over Africa.

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-79	Surface Downward Longwave Radiation	SDL_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	Offline

Accuracy	
90 per cent of absolute bias values below 10 W/m² (+ uncertainty of ground based measurements) for monthly means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-80	Surface Downward Longwave Radiation	SDL_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged product Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI, AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
10 W/m² monthly mean, for details see components	
Verification method	Comparison with in-situ measurements of components CM-79 and CM-78.

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-85	Surface Net Longwave Radiation	SNL_SEVIRI
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean, Monthly Mean Diurnal Cycle	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m², see components for details	
Verification method	calculated based on accuracy of SOL and SDL

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-86	Surface Net Longwave Radiation	SNL_AVHRR_Europe
Type	Product	
Applications and users		
Characteristics and Methods	Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m², see components for details	
Verification method	calculated based on accuracy of SOL and SDL

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-87	Surface Net Longwave Radiation	SNL_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged product, Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI, AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
15 W/m², see components for details	
Verification method	calculated based on accuracy of SOL and SDL

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-92	Surface Radiation Budget		SRB_SEVIRI
Type	Product		
Applications and users			
Characteristics and Methods	Monthly Mean, Monthly Mean Diurnal Cycle		
Comments			
Generation frequency	1 month		
Input satellite data	SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
20 W/m², see components for details			
Verification method	Calculated based on accuracy of components		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-93	Surface Radiation Budget		SRB_AVHRR_Europe
Type	Product		
Applications and users			
Characteristics and Methods	Monthly Mean		
Comments			
Generation frequency	1 month		
Input satellite data	AVHRR		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
20 W/m², see components for details			
Verification method	Calculated based on accuracy of components.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-94	Surface Radiation Budget	SRB_merged
Type	Product	
Applications and users		
Characteristics and Methods	Merged product, Monthly Mean	
Comments		
Generation frequency	1 month	
Input satellite data	SEVIRI, AVHRR	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
20W/m², see components for details	
Verification method	Calculated based on accuracy of components.

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²		**Product discontinued on 01.03.2012 Products are only available until 28.02.2012**

CM-104	Direct Irradiance at Surface	SID_SEVIRI
Type	Product	
Applications and users	* NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments		
Generation frequency	1 day, 1 month	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy	
90 per cent of absolute bias values below 15 W/m² (+uncertainty of ground based measurements) for monthly means. Higher bias values occur in the Alpine and other mountainous regions, e.g. due to uncertainties in area to point comparison.	
Verification method	comparison with in -situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(15 km)²		2 month

CM-112	Incoming Solar Radiative Flux at the top of Atmosphere		TIS_merged
Type	Product		
Applications and users			
Characteristics and Methods	Daily mean, Monthly Mean, Monthly Mean Diurnal Cycle		
Comments	The accuracy is given as the (maximum absolute) bias.		
Generation frequency	1 day 1 month		
Input satellite data	DIARAD/VIRGO		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
1 W/m² (This accuracy is invariant in time and will not be monitored in OR)			
Verification method	Intercomparison of absolute radiometers		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk, Northern Europe	(45 km) ²		4 month

CM-114	Reflected solar Radiative Flux at the Top of Atmosphere		TRS
Type	Product		
Applications and users			
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle		
Comments	The accuracy for development targets is given as the RMS error. For the SeSp accuracy is given as a ratio as described in the verification method		
Generation frequency	1 day 1 month		
Input satellite data	GERB, SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
0.88 – 1.12 in ratio			
Verification method	Comparison to CERES, evaluated is the ratio of GERB/CERES. For data of Meteosat 8 comparison to GERB-like is used in the same fashion. Compared are temporal slots between 11 and 12 UTC only.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(45 km) ²		4 month

CM-116	Emitted Thermal Radiative Flux at the Top of Atmosphere		TET
Type	Product		
Applications and users			
Characteristics and Methods	Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle		
Comments	The accuracy for development targets is given as the RMS error. For the SeSp accuracy is given as a ratio as described in the verification method		
Generation frequency	1 day 1 month		
Input satellite data	GERB, SEVIRI		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
0.94 – 1.06 in ratio			
Verification method	Comparison to CERES, evaluated is the ratio of GERB/CERES. For data of Meteosat 8 comparison to GERB-like is used in the same fashion. Compared are temporal slots between 11 and 12 UTC only.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(45 km) ²		4 month

CM-122	Vertically Integrated Water Vapour		HTW_ATOVS_global
Type	Product		
Applications and users			
Characteristics and Methods	Daily Mean, Monthly Mean		
Comments			
Generation frequency	1 month		
Input satellite data	ATOVS		
Dissemination			
Format	Means	Type	
HDF5	FTP, CD-ROM, Email	offline	
Accuracy			
1 mm bias (absolute value), 4.5 mm rms, Higher deviations may occur over desert regions.			
Verification method	GUAN radiosonde		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	(90 km)²		2 month

CM-127	Vertically Integrated Water Vapour	HTW_SSMI_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	The time series covers 1987-2005. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination

Format	Means	Type
Netcdf	FTP	offline

Accuracy

0.05 % decadal stability, 1 kg m^{-2} bias, 2 kg m^{-2} rms

Verification method	ground based measurements inter-satellite comparison

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-131	Layered water vapor and temperature	HLW_ATOVS_global
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean 5 layers	
Comments		
Generation frequency	1 month	
Input satellite data	ATOVS	

Dissemination

Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy

Temperature [K]			Humidity [mm]		
layer	bias	rms	layer	bias	rms
1	1.25	2	1	0.015	0.08
2	1.00	2	2	0.15	0.75
3	0.50	2	3	0.20	1.75
4	0.50	2.25	4	0.75	2.0
5	0.75	2.25	5	0.6	2.75

Higher deviations may occur over desert regions.

Verification method	GUAN radiosonde

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(90\ km)^2$		2 month

CM-137	Specific Humidity and Temperature at pressure levels	HSH_ATOVS_global
Type	Product	
Applications and users		
Characteristics and Methods	Daily Mean, Monthly Mean 6 levels	
Comments		
Generation frequency	1 month	
Input satellite data	ATOVS	

Dissemination

Format	Means	Type
HDF5	FTP, CD-ROM, Email	offline

Accuracy

Temperature [K]			Humidity [g/kg]		
level	bias	rms	level	bias	rms
1	1.25	3.0	1	0.015	0.05
2	1.25	2.0	2	0.02	0.25
3	0.5	2.0	3	0.1	1.0
4	0.3	2.0	4	0.2	1.5
5	0.3	2.0	5	0.5	2.0
6	0.4	2.5	6	0.3	2.0

Higher deviations may occur over desert regions.

Verification method	GUAN radiosonde

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	(90 km)²		2 month

CM-141	Near Surface Specific Humidity	NSH_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination

Format	Means	Type
Netcdf	FTP	offline

Accuracy

Bias:-0.4 g/kg (3%), RMS: 0.1 g/kg (1%); decadal stability: -0.1 %	
Verification method	Comparison to ship and buoy based measurements

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-142	Near Surface Wind Speed	SWS_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination		
Format	Means	Type
Netcdf	FTP	offline

Accuracy	
Bias: 0.24 m/s, rms: 0.15 m/s, Decadal stability: 0.09 m/s	
Verification method	Comparison to ship and buoy based measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-143	Latent Heat Fluxes	LHF_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination		
Format	Means	Type
Netcdf	FTP	offline

Accuracy	
Bias: 1 W/m², rms: 3.7 W/m², Decadal stability: 2.7 W/m²	
Verification method	Comparison to ship and buoy based measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-144	Precipitation	PRE_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination		
Format	Means	Type
Netcdf	FTP	offline

Accuracy	
Bias: -0.12 mm/d, rms: 0.14 mm/d, Decadal stability: -0.01 mm/d	
Verification method	Comparison to ship and buoy based measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-145	Evaporation	EVA_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination		
Format	Means	Type
Netcdf	FTP	offline

Accuracy	
Bias: 0.04 mm/d, rms: 0.13 mm/d, Decadal stability: -0.01 mm/d	
Verification method	Comparison to ship and buoy based measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-146	Evaporation-Precipitation	EMP_HOAPS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Composite Monthly Mean	
Comments	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination

Format	Means	Type
Netcdf	FTP	offline

Accuracy

Bias:0.04 mm/d ,rms: 0.2 mm/d, Decadal stability: 0.1 mm/d	
Verification method	Comparison to global river runoff data. Comparison to integrated water vapor.

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global ice free ocean	0.5°		N/A

CM-54	Surface incoming shortwave radiation	SIS_MVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Instantaneous Monthly Mean, Daily Mean	
Comments	time series from 1983-2005	
Generation frequency	N/A	
Input satellite data	MVIRI	

Dissemination

Format	Means	Type
netcdf	FTP	Offline

Accuracy

Monthly means: Mean abs. diff. (MAD): 8 W/m² Daily means /instantan: Mean abs. diff. (MAD): 15 W/m²
Verification method: comparison with in-situ measurements

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Regular latitude longitude grid 0.03 x 0.03 degree		N/A

CM-106	Direct Irradiance at Surface	SID_MVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Instantaneous Monthly Mean, Daily Means	
Comments	time series from 1983-2005	
Generation frequency	N/A	
Input satellite data	MVIRI	

Dissemination		
Format	Means	Type
netcdf	FTP	Offline

Accuracy	
Monthly means: Mean abs. diff. (MAD):11 W/m² Daily means /instantan: Mean abs. diff. (MAD): 20.7 W/m²	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Regular latitude longitude grid 0.03 x 0.03 degree		N/A

CM-111	Cloud Albedo	CAL_MVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Instantaneous, Monthly Mean, Daily mean	
Comments	time series from 1983-2005	
Generation frequency	N/A	
Input satellite data	MVIRI	

Dissemination		
Format	Means	Type
netcdf	FTP	Offline

Accuracy	
Monthly means: Mean abs. diff. (MAD):0.05 – 0.1 Daily means /instantan: Mean abs. diff. (MAD): 0. W/m²	
Verification method	RTM studies using GERB TOA flux

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Regular latitude longitude grid 0.03 x 0.03 degree		N/A

CM-05	Fractional Cloud Cover	CFC_AVHRR_global_DS
Type	Data set	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	Time series from 1982-2009. The accuracy is defined as the mean error (i.e., defined in % cloud amount units) and precision is defined as the bias-corrected RMS error.	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Accuracy: 3.6 % (SYNOP) Bias corrected rms: 10% (SYNOP)	
Verification method	Primarily comparisons with SYNOP but complemented with consistency checks against MODIS and Cloudsat/CALIPSO datasets

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25)^2$	n/a	N/A

CM-11	Joint Cloud Histograms	JCH_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research	
Characteristics and Methods	Monthly histograms of Cloud top pressure and cloud optical depth. This product is a combination of COT (CM-34), CPH (CM-38) and CTO (CM-17) and depends on the accuracy of these products.	
Comments	Time series from 1982-2009.	
Generation frequency	N/A	
Input satellite data	CTO (CM-17), COT (CM-34), CPH (CM-38)	

Dissemination		
Format	Means	Type
Netcdf	FTP	offline

Accuracy	
n/a	
Verification method	n/a

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(1.0)^2$	n/a	N/A

CM-17	Cloud Top	CTO_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Daily Mean and Monthly Mean for: Cloud Top Temperature (CTT) Cloud Top Height (CTH) Cloud Top Pressure (CTP)	
Comments	Time series from 1982-2009. The Accuracy is defined as the Mean error and precision is defined as the Bias-corrected RMS error.	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
The accuracy is given taking MODIS data as reference Accuracy: -40 to -50 hPa Bias corrected RMS: < 80 hPa	
Verification method	Comparison with MODIS, PATMOS-X and ISCCP.

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25)^2$	n/a	N/A

CM-34	Cloud Optical Thickness	COT_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
The accuracy is given taking MODIS data as reference Accuracy: -5 % to -10 % bias corrected RMS: 30 % decadal stability: tbd	
Verification method	• Comparison with MODIS (2000-2009) • Comparison with PATMOS-x • Comparison with ISCCP • Comparison with Cloudsat/Calipso (2007-2009)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-38	Cloud Phase	CPH_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy

The accuracy is given taking MODIS data as reference
Bias: 3-20 %
Bias corrected RMS: 12-20 %
Decadal stability: tbd

Verification method	• Comparison with MODIS (2000-2009) • Comparison with PATMOS-x • Comparison with ISCCP • Comparison with Cloudsat/Calipso (2007-2009)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	(0.25°)²	n/a	N/A

CM-43	Liquid Water Path	LWP_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy

The accuracy is given taking MODIS data as reference
Bias: 15 %
Bias corrected RMS: 35-45 %
Decadal stability tbd

Verification method	• Comparison with satellite MWR retrieved LWP over ocean (e.g. LWP_HOAPS). • Comparison with MODIS (2000-2009). • Comparison with PATMOS-x • Comparison with ISCCP

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-47	Ice Water Path	IWP_AVHRR_Global_DS
Type	dataset	
Applications and users	Climate Research	
Characteristics and Methods	daily mean, monthly mean The time period covered will be 1982-2009	
Comments	Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.	
Generation frequency	N/A	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy

The accuracy is given taking MODIS data as reference
Bias: 0 % to -80 %
Bias corrected rms: 35-45 %
Decadal stability: tbd

Verification method	• comparison with CloudSat • comparison with PATMOS-X • comparison with MODIS • comparison with ISCCP

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	(0.25)²	n/a	n/a

CM-52	Surface incoming shortwave radiation	SIS_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy

Monthly mean accuracy: 10 W/m²
Daily mean accuracy: 20 W/m²

Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-60	Surface Albedo	SAL_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Pentad Mean Monthly Mean	
Comments	time series from 1982-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination

Format	Means	Type
netcdf	FTP	offline

Accuracy

Mean relative retrieval error: -10.3 %
Mean rmse: 0.091
Decadal stability over central Greenland Ice Sheet (1989-2009, in relative units): 5.8 %

Verification method	continuous validation at mast measurement sites & field campaigns

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-67	Surface Net Shortwave Radiation	SNS_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination

Format	Means	Type
netcdf	FTP	offline

Accuracy

monthly mean accuracy: 20 W/m²

Verification method	calculated based on accuracy of SAL and SIS

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-74	Surface Outgoing Longwave Radiation	SOL_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	NWP (AVHRR_GAC)	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Monthly mean accuracy: 14 W/m²	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$		N/A

CM-81	Surface Downward Longwave Radiation	SDL_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Monthly mean accuracy: 8 W/m²	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-88	Surface Net Longwave Radiation	SNL_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Monthly mean accuracy: 22 W/m²	
Verification method	calculated based on accuracy of SOL and SDL

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-95	Surface Radiation Budget	SRB_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Daily Mean TBC Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Monthly mean accuracy: 42 W/m²	
Verification method	calculated based on accuracy of SNS and SNL

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-100	Cloud Radiative Effect SW	CFS_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Privat Sector * Public Sector	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf	FTP	offline

Accuracy	
Monthly mean accuracy: 15 W/m²	
Verification method	calculated from radiation products

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-101	Cloud Radiative Effect LW	CFL_AVHRR_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1989-2009	
Generation frequency	N/A	
Input satellite data	AVHRR_GAC	

Dissemination		
Format	Means	Type
netcdf CF	FTP	offline

Accuracy	
Monthly mean accuracy 15 W/m^2	
Verification method	calculated from radiation products

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.25°)^2$	n/a	N/A

CM-69	Surface Net Shortwave Radiation	SNS_MVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Monthly Mean	
Comments	time series from 1983-2005	
Generation frequency	N/A	
Input satellite data	MVIRI based solar radiation (CM-54) and the AVHRR GAC surface albedo (CM-60)	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, CD-ROM	offline

Accuracy	
The accuracys is generally below 10 W/m**2 for all surface types with exception of bright desert and snow/ice surfaces. Here the accuracy is below 20 W/m**2, slightly higher uncertainties might occur over fresh snow and ice during the summertimes	
Verification method	calculated based on accuracy of SAL and SIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Regular latitude longitude grid 0.03 x 0.03 degree	n/a	N/A

CM-150	Microwave Radiance FCDR	FCDR_SSMI_global_DS
Type	Dataset	
Applications and users	* NMS and reanalyses for assimilation * Validation of (climate) models * Basis for TCDR products (from CM SAF, OSI SAF) * Soil moisture community	
Characteristics and Methods	Brightness Temperatures, swath-based, imager channels of SSM/I	
Comments	The time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur. Quality is applicable for ocean observations.	
Traceability of Requirements	See section PRD section 10.7 for details	
Generation frequency	N/A	
Input satellite data	SSM/I	

Dissemination		
Format	Means	Type
Netcdf CF	FTP	offline

Accuracy	
bias: < 0.25 K for all channels RMS: < 1 K; (< 2 K for channels 37h and 85h) decadal stability: < 0.1 K/decade for all channels	
Verification method	intersatellite comparison (rms based on global monthly means)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	Sensor resolution	n/a	N/A

CM-113	Reflected solar Radiative Flux at the Top of Atmosphere		TRS_merged_DS
Type	Dataset		
Applications and users	* Climate Research * NMHSs		
Characteristics and Methods	Daily mean Monthly Mean Monthly Mean Diurnal Cycle		
Comments	time series from 01.02.2004- 31.01.2011		
Generation frequency	N/A		
Input satellite data	GERB, SEVIRI, CERES		
Dissemination			
Format	Means	Type	
netcdf CF	FTP	offline	
Accuracy			
Monthlymean (rms): 3 W/m² daily mean (rms): 5.5 W/m²"			
Verification method	GERB CERES intercomparison		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat Disk + Arctic	$(45\ km)^2$		N/A

CM-115	Emitted Thermal Radiative Flux at the Top of Atmosphere		TET_merged_DS
Type	Dataset		
Applications and users	* Climate Research * NMHSs		
Characteristics and Methods	Daily mean Monthly Mean Monthly Mean Diurnal Cycle		
Comments	time series from 01.02.2004-31.01.2011		
Generation frequency	N/A		
Input satellite data	GERB, SEVIRI		
Dissemination			
Format	Means	Type	
netcdf CF	FTP	offline	
Accuracy			
monthly mean (rms): 2 W/m² daily mean (rms): 3.6 W/m²"			
Verification method	GERB CERES intercomparison		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk + Arctic	$(45\ km)^2$		N/A

CM-123	Vertically Integrated Water Vapour	HTW_ATOVS_global_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	Time series from 01.01.1999-31.12.2011 Accuracy numbers are given for global mean values.	
Generation frequency	N/A	
Input satellite data	ATOVS	

Dissemination

Format	Means	Type
Netcdf CF	FTP, CD-ROM	Offline

Accuracy

vs. GUAN measurements Bias -0.16 kg/m² RMS: 3.25 kg/m²	Vs. AIRS measurements: Bias:1.53 k/m² RMS: 2.38 kg/m²
Verification method	ground based measurements intersatellite comparison

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(90\ km)^2$		N/A

CM-132	Layered water vapour and temperature	HLW_ATOVS_global_DS
Type	Dataset	
Applications and users	* Climate Research, NMHSs	
Characteristics and Methods	Daily Mean, Monthly Mean, 5 layers	
Comments	Time series from 01.01.1999-31.12.2011. Accuracy numbers are given for global mean values.	
Generation frequency	N/A	
Input satellite data	ATOVS	

Dissemination

Format	Means	Type
Netcdf CF	FTP, CD-ROM	offline

Accuracy

Temperature [K]		
layer	bias	rmse
1	0.11	1.34
2	-0.23	1.24
3	-0.16	1.34
4	-0.13	1.44
5	-0.35	1.8

Humidity [kg m^{-2}]		
layer	bias	rmse
1	0.0014	0.035
2	0.0029	0.39
3	0.22	1.15
4	0.21	1.25
5	-0.64	1.72

Verification method	ground based measurements, intersatellite comparison

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(90\ km)^2$		N/A

CM-138	Specific Humidity and Temperature at pressure levels	HSH_ATOVS_global_DS
Type	Dataset	
Applications and users	* Climate Research, NMHSs	
Characteristics and Methods	Daily Mean, Monthly Mean, 6 levels	
Comments	Time series from 01.01.1999-31.12.2011. Accuracy numbers are given for global mean values.	
Generation frequency	N/A	
Input satellite data	ATOVS	

Dissemination

Format	Means	Type
Netcdf CF	FTP, CD-ROM	offline

Accuracy

Temperature [K]		
level	bias	rms
1	0.026	1.80
2	-0.25	1.32
3	-0.13	1.45
4	-0.076	1.46
5	-0.17	1.70
6	0.029	1.81

Humidity [g/kg]		
level	bias	rms
1	0.0032	0.021
2	-0.013	0.076
3	0.05	0.45
4	0.15	0.92
5	0.11	1.01
6	-0.046	1.32

Verification method	ground based measurements intersatellite comparison

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(90\ km)^2$		N/A

CM-139	Free Tropospheric Humidity	FTH_Meteosat_disk_DS
Type	Dataset	
Applications and users	* Climate Research	
Characteristics and Methods	3-hourly Monthly Mean	
Comments	Time series from 01.07.1983-30.11.2009. CSR data set as auxiliary product. LMD processed the CSR for the period July 1983 - June 2005, CM SAF from July 2005 - June 2008. The data set does not contain the METEOSAT-6 period (March 1997 – May 1998) and July 2005	
Traceability of Requirements		
Generation frequency	N/A	
Input satellite data	MVIRI, SEVIRI	

Dissemination

Format	Means	Type
Netcdf CF	FTP	offline

Accuracy

bias: -2.9%, rmsd: 15.5%
decadal stability: 0.5±0.45%

Verification method	with the ARSA radiosondes data set

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk covering ±45° N/S and ±45° W/E	$(0.625°)^2$		N/A

CM-06	Fractional Cloud Cover	CFC_SEVIRI_disk_DS
Type	Data set	
Applications and users	Climate Research, NMHSs, Government agencies, Private & Public Sector	
Characteristics and Methods	Level 2 hourly, Daily & Monthly Mean, Monthly Mean Diurnal Cycle	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination

Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	offline

Accuracy

Bias 2.7 %,(SYNOP) RMS: 14.0 % (SYNOP)	Bias 1.7 % (MODIS) RMS: 8.8 % (MODIS)
Verification method	comparisons with SYNOP and complemented with consistency checks against MODIS and Cloudsat/CALIPSO datasets

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Pixel resolution. level 2 $(0.05)^2$ level 3 $(0.25)^2$ diurnal cycle	n/a	N/A

CM-12	Joint Cloud Histograms	JCH_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research	
Characteristics and Methods	Monthly histograms of Cloud top pressure and cloud optical depth This product is a combination of COT (CM-35), CPH (CM-39) and CTO (CM-18) and depends on the accuracy of these products.	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	CTO (CM-18), CPH (CM-39), COT (CM-35)	

Dissemination

Format	Means	Type
netcdf CF	FTP	offline

Accuracy

N/a	N/a	N/a
Verification method		

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <72° satellite zenith angle	$(0.25°)^2$	n/a	N/A

CM-18	Cloud Top	CTO_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research, NMHSs, Government agencies, Private & Public Sector	
Characteristics and Methods	Contains: Level2 hourly, Daily Mean, Monthly Mean and Monthly Mean Diurnal Cycle for: Cloud Top Temperature (CTT), Cloud Top Height (CTH), Cloud Top Pressure (CTP)	
Comments	Time series from 01.01.2004-31.12.2011	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	offline

Accuracy	
Bias: -646.92 m, -10.7 % (Cloudnet) Bias: -687.2 m, -11.6 % (CALIOP) Bias: -83.2 m, -1.3 % (CPR)	stdv: 781.8 m (Cloudnet) stdv: 2149.1 m (CALIOP) stdv: 2450.9 m (CPR)
Verification method	Validation against Cloudnet, Cloudsat/Calipso; comparison against MODIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Pixel resolution. level 2 $(0.05)^2$ level 3 $(0.25)^2$ diurnal cycle		N/A

CM-35	Cloud Optical Thickness	COT_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Level 2 hourly Daily Mean Monthly Mean Monthly Mean Diurnal Cycle	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	offline

Accuracy	
bias: 9.9 % rms: 32.4 %	
Verification method	Comparison with MODIS

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <72° satellite zenith angle	Pixel resolution. level 2 $(0.05)^2$ level 3 $(0.25)^2$ diurnal cycle	n/a	N/A

CM-39	Cloud Phase	CPH_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	level 2 hourly Daily Mean Monthly Mean Monthly Mean Diurnal Cycle	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination

Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	offline

Accuracy

bias: -0.03 (MODIS-IR), 0.14 (MODIS-OPT)
rms: 0.11 (MODIS-IR), 0.21 (MODIS-OPT)

Verification method	• Comparison with MODIS

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <72° satellite zenith angle	Pixel resolution. level 2 (0.05)² level 3 (0.25)² diurnal cycle	n/a	N/A

CM-44	Liquid Water Path	LWP_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Level 2 hourly Daily Mean Monthly Mean Monthly Mean Diurnal Cycle	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination

Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	offline

Accuracy

bias: -0.3 % (MODIS), -1.7 % (SSM/I)
rms: 33.6 %

Verification method	Comparison with MODIS and LWP from SSM/I

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <72° satellite zenith angle	Pixel resolution. level 2 (0.05)² level 3 (0.25)² diurnal cycle		N/A

CM-46	Ice Water Path	IWP_SEVIRI_disk_ds
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Level2 hourly Daily Mean, Monthly Mean, Monthly Mean Diurnal Cycle	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination

Format	Means	Type
netcdf CF (Level 3) hdf5 (level 2)	FTP	Offline

Accuracy

bias: -6.2 % rms: 37.8 %	
Verification method	Comparison with MODIS

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <72° satellite zenith angle	Pixel resolution. level 2 $(0.05)^2$ level 3 $(0.25)^2$ diurnal cycle		n/a

CM-53	Surface incoming shortwave radiation	SIS_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI/GERB	

Dissemination

Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy

Absolute bias: 7.2 W/m^2 monthly means 14.8 W/m^2 daily mean	
Verification method	comparison with in-situ BSRN measurements

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05°)^2$		N/A

CM-61	Surface Albedo	SAL_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	pentad Mean Monthly Mean	
Comments	Time series from 01.01.2004-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy		
Threshold	Target	Optimal
50% (relative)	25% (relative)	20% (relative)
Verification method	validation at mast measurement sites & field campaigns	

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05)^2$		N/A

CM-68	Surface Net Shortwave Radiation	SNS_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
4.38 W/m^2	
Verification method	calculated based on accuracy of CM-61 (SAL) and CM-53 (SIS)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05°)^2$		N/A

CM-75	Surface Outgoing Longwave Radiation	SOL_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	NWP (SEVIRI)	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 4.3 W/m^2	
Verification method	comparison with in-situ BSRN measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-82	Surface Downward Longwave Radiation	SDL_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 9.6 W/m^2	
Verification method	comparison with in-situ BSRN measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-89	Surface Net Longwave Radiation	SNL_SEVIRI_disk_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 12 W/m^2	
Verification method	calculated based on accuracy of CM-75 (SOL) and CM-82 (SDL)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05°)^2$		N/A

CM-96	Surface Radiation Budget	SRB_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 16 W/m^2	
Verification method	calculated based on accuracy of CM-89(SNL) and CM-68 (SNS)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05°)^2$		N/A

CM-102	Cloud Radiative Effect SW	CFS_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 7 W/m^2	
Verification method	calculated from radiation products (CM-53, SIS and CM-61, SAL)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05)^2		N/A

CM-103	Cloud Radiative Effect LW	CFL_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
netcdf CF	FTP, CD-ROM	offline

Accuracy	
Absolute bias: 4.1 W/m^2	
Verification method	calculated from radiation products and CM-06 (CFC)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-105	Direct Irradiance at Surface	SID_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	time series from 01.01.12006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP	offline

Accuracy	
Absolute bias: 11.0 W/m^2 monthly mean 20.2 W/m^2 daily mean	
Verification method	comparison with in-situ measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-107	Spectrally Resolved Irradiance	SRI_MVIRI_SEVIRI_DS
Type	Dataset	
Applications and users	* Solar energy community * Agriculture meteorology (e.g. PAR). * Medicine meteorology. * Climate community (system analysis)	
Characteristics and Methods	Daily and Monthly Mean.	
Comments	Time series 01.01.1991-31.12.2011	
Generation frequency	N/A	
Input satellite data	MVIRI continued with SEVIRI	

Dissemination		
Format	Means	Type
Netcdf CF	FTP	Offline

Accuracy	
Relative bias: < 5 %, for spectral bands 400-1100 nm < 12% for spectral bands 1100-1500 nm	
Verification method	Comparison with ground based data as far as available

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Spectral resolution	Timeliness
Meteosat disk	0.05° x 0.05°	20[1] Kato bands in VIS and NIR spectrum	N/A

[1] For definition of Kato bands see Kato et al. [1999].

CM-109	Daylight	DAL_SEVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	time series from 01.01.2006-31.12.2011	
Generation frequency	N/A	
Input satellite data	SEVIRI/GERB	

Dissemination		
Format	Means	Type
netcdf CF	FTP	offline

Accuracy	
Absolute bias: 2.0 W/m^2	
Verification method	comparison with in-situ measurements, only one station was available for validation

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-110	Daylight	DAL_MVIRI_DS
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector	
Characteristics and Methods	Daily Mean Monthly Mean	
Comments	time series from 01.01.1983-31.12.2005	
Generation frequency	N/A	
Input satellite data	MVIRI	

Dissemination		
Format	Means	Type
netcdf CF	FTP	offline

Accuracy	
Absolute bias: 2.0 W/m^2	
Verification method	comparison with in-situ measurements, only one station was available for validation

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)^2		N/A

CM-21012 SEVIRI Fractional Cloud Cover ICDR CFC_SEVIRI_disk_DS_R3			
Type	Data record		
Applications and users	Climate Research & Climate Modelling		
Characteristics and Methods	level2 full temporal resolution		
Record length / Period	Jan 2004 – 31. December 2012		
Comments	Needed for a consistent LSA and OSI SAF CDR processing and based on LSA and OSI SAF requirements. Based on NWC SAF MSGv2012, time-dependent 15 min. processing		
Traceability of Requirements			
Input satellite data	SEVIRI (reprocessed CAF version)		
Dissemination			
Format	Means	Type	
Hdf5	FTP, WEB	offline	
Accuracy			
Cloud POD: 0.946 ± 0.008 for CALIOP and 0.902 ± 0.011 for CPR			
Verification method	comparison against CALIPSO datasets		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Pixel resolution level 2	n/a	N/A

CM-23081 Meteosat Cloud Albedo TCDR CAL_MVIRI_SEVIRI_DS_R1		
Type	Dataset	
Applications and users	* Climate impact analysis (DWD,EURO4M) * Climate model evaluation and development (DWD,EURO4M) * Climate change analysis (WMP-RCC,EURO4M) * Development agencies (GTZ) * Agricultural planning and drought risk assessment (GTZ) * Solar energy (JRC)	
Characteristics and Methods	hourly, daily and monthly means	
Record length / Period	1983-2012	
Comments	Processing chain exists at MeteoSwiss, integration to DWD system needed. Moreover, improvement of algorithms and used atmospheric input will be performed	
Traceability of Requirements	SAF/CM/DWD/RR2.1 v 1.1 dated 05.07.2013	
Input satellite data	MVIRI/SEVIRI (Rectified digital pixel counts)	
Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline
Accuracy		
0.1 for monthly data (0.15 daily) is reached with exception of the winter period for latitudes above 55 degrees, where higher uncertainties might occur		
Verification method	accuracy estimated based on derived SIS accuracy	
Coverage, resolution and timeliness		
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	$(0.05°)^2$	n/a	N/A

CM-23201	Meteosat Solar Surface Radiation TCDR	SIS_MVIRI_SEVIRI_DS_R1
Type	Dataset	
Applications and users	Climate impact analysis (DWD,EURO4M,PIK) Climate model evaluation and development (DWD, EURO4M) Climate change analysis (WMO-RCC,EURO4M) Development agencies (GTZ) agricultural planning and drought risk assessment (GTZ, Univ. Bologna);Solar energy (JRC,BSW,ISET)	
Characteristics and Methods	hourly, daily and monthly means	
Record length / Period	1983-2012	
Comments		
Traceability of Requirements	SAF/CM/DWD/RR2.1 v 1.1 dated 05.07.2013	
Input satellite data	MVIRI/SEVIRI (Rectified digital pixel counts)	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy	
Daily: Acc. (MAB) 12.1 W/m² Monthly: Acc. (MAB): 5.5 W/m² Dec. stab.vs BSRN stations: -0.8W/(m²decade)	
Verification method	comparison with BSRN ground measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)²	n/a	N/A

CM-23231	Meteosat Direct Normalised Irradiance TCDR	DNI_MVIRI_SEVIRI_DS_R1
Type	Dataset	
Applications and users	Climate impact analysis, Climate model evaluation and development , Climate change Development agencies , Agricultural planning and drought risk assessment, Solar energy	
Characteristics and Methods	hourly, daily and monthly means	
Record length / Period	1983-2012	
Comments		
Traceability of Requirements	SAF/CM/DWD/RR2.1 v 1.1 dated 05.07.2013	
Input satellite data	MVIRI/SEVIRI (Rectified digital pixel counts)	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy	
Daily Accuracy (MAB) 34.0 W/m² Monthly Acc. (MAB) 17.5 W/m²	
Verification method	comparison with ground measurements

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)²	n/a	N/A

CM-12001	Microwave Radiance FCDR R2	FCDR_SSMI_DS_R2
Type	Dataset	
Applications and users	* NMS and reanalyses for assimilation * Validation of (climate) models * Basis for TCDR products (from CM SAF, OSI SAF) * Of interest to the soil moisture community	
Characteristics and Methods	swath-based product, imager channels similar to SSM/I	
Record length / Period	1987-2013	
Comments	Verification might not cover full period. Accuracy is given for global means. The SSM/I like FCDR also covers land areas. However, the viewing angle correction is not applied here, and due to likely larger temperature ranges the uncertainty might be increased.	
Traceability of Requirements	Ohring et al. 2005; SAF/CM/DWD/RR/2.3; v 1.1 dated 18.12.2013	
Input satellite data	SSM/I, SSMIS	
Dissemination		
Format	Means	Type
Netcdf4 CF	FTP, WEB	offline
Accuracy		
Accuracy (bias): ≤ 1K decadal stability: < 0.03 K/decade for all channels		
Verification method	Inter-sensor comparison	
Coverage, resolution and timeliness		
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	sensor resolution	n/a	N/A

CM-21011	SEVIRI Fractional Cloud Cover ICDR	CFC_SEVIRI_disk_DS_R2
Type	Dataset	
Applications and users	Climate Research & NMHSs & Governm. Agencies	
Characteristics and Methods	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle	
Record length / Period	2004-2015	
Comments	Contains as additional layer: cloud type	
Traceability of Requirements	SAF/CM/CDOP2/KNMI/RR 2.4 v 1.2 dated 13.06.2014	
Input satellite data	SEVIRI (MSG-1, MSG-2, MSG-3)	
Dissemination		
Format	Means	Type
Netcdf4 CF (level 2 and 3)	FTP, WEB	offline
Accuracy		
Bias: ≈ 3% (CALIOP), 3.8 % (SYNOP) -1.1 % (MODIS) L2 PODcld: 87.5% (CALIOP) L2 FARcld: 16.9% (CALIOP) L3 bc-rms: 10.0 % (SYNOP) 7.2 % (MODIS)		
Verification method	Level 2: comparison against CALIPSO datasets, level 3: primarily comparisons with SYNOP but complemented with consistency checks against MODIS and Cloudsat/CALIPSO datasets	
Coverage, resolution and timeliness		
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Pixel resolution level 2 $(0.05)^2$ level 3 $(0.25)^2$ monthly mean diurnal cycle	n/a	N/A

CM-21021 Joint Cloud Histograms	JCH_SEVIRI_disk_DS_R2
Type	Dataset
Applications and users	* Climate Research
Characteristics and Methods	Monthly histograms of Cloud top pressure and cloud optical depth This product is a combination of COT (from CM-21051), CPH (CM-21041) and CTO (CM-21031) and depends on the accuracy of these products.
Record length / Period	Time series from 2004-2015
Traceability of requirements	SAF/CM/CDOP2/KNMI/RR2.4 v1.2, dated 13.06.2014
Generation frequency	N/A
Input satellite data	CTO (CM-21031), CPH (CM-21041), COT (from CM-21051)

Dissemination

Format	Means	Type
Netcdf4 CF	FTP	offline

Accuracy

N/a (depends on the accuracy of COT (CM-21051), CPH (CM-21041) and CTO (CM-21031).

Verification method	n/a

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <84° satellite zenith angle	$(0.25°)^2$	n/a	N/A

CM-21031 SEVIRI Cloud Top Level ICDR	CTO_SEVIRI_DS_R2
Type	Dataset
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector
Characteristics and Methods	Level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle, 1D histogram
Record length	2004-2015
Comments	Requirements are specified for CTH and CTP (as bias and bc-rms). No requirements are specified for CTT as this parameter represents the same information in different units.
Traceability of Requirements	SAF/CM/CDOP2/KNMI/RR2.4 v1.2, dated 13.06.2014
Input satellite data	SEVIRI (MSG-1, MSG-2, MSG-3)

Dissemination

Format	Means	Type
Netcdf4 CF (level 2 and 3)	FTP, WEB	offline

Accuracy

CTH (bias):-520 m (CALIOP), 307 m (MODIS)
CTH, L2 bc-rms: 2398 m (CALIOP)
CTH, L3 bc-rms: 949 m (MODIS)

CTP (bias):-2.2 hPa (CALIOP), -58.6 hPa (MODIS)
CTP, L2 bc-rms: 62.7 hPa (MODIS)
CTP, L3 bc-rms: 134.1 hPa (CALIOP)

Verification method	comparisons with MODIS retrievals as well as CloudSat/CALIPSO, EarthCARE will be considered

Coverage, resolution and timeliness

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	Pixel resolution level 2 $(0.05)^2$ level 3 $(0.25)^2$ monthly mean diurnal cycle	n/a	N/A

CM-21041 SEVIRI Cloud Phase ICDR R2			CPH_SEVIRI_DS_R2
Type	Dataset		
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector		
Characteristics and Methods	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle		
Record length / Period	2004-2015		
Comments			
Traceability of Requirements	SAF/CM/CDOP2/KNMI/RR24 v1.2 dated 13.06.2014		
Input satellite data	SEVIRI (MSG-1, MSG-2, MSG-3)		
Dissemination			
Format	Means	Type	
Netcdf CF (lev 3), Hdf5 (lev 2)	FTP, WEB	offline	
Accuracy			
Bias: ≈ 0% (CALIOP), 1% (MODIS) L2 PODliq: 85.5 % (CALIOP) L2 FARliq: 10% (CALIOP) L2 PODice: 88.9% (CALIOP) L2 FARice: 16% (CALIOP) L3 bc-rms:8.7 % (MODIS)			
Verification method	comparison with MODIS (2004-2014), comparison with Cloudsat/Calipso (2007-2014, level-2, selected months)		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk (day and night)	Pixel resolution level 2 (0.05)² level 3 (0.25)² monthly mean diurnal cycle	n/a	N/A

CM-21051 SEVIRI Liquid Water Path ICDR			LWP_SEVIRI_DS_R2
Type	Dataset		
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector		
Characteristics and Methods	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle, 1D histograms		
Record length / Period	2004-2015		
Comments	Contains as additional layers: COT (cloud optical thickness), REFF (particle effective radius), and H scene heterogeneity measure)		
Traceability of Requirements	SAF/CM/CDOP2/KNMI/RR24 v1.2 dated 13.06.2014		
Input satellite data	SEVIRI (MSG-1, MSG-2, MSG-3)		
Dissemination			
Format	Means	Type	
Netcdf CF (level 3) Hdf5 (level 2)	FTP, WEB	offline	
Accuracy			
Bias: 6.17 g m-2 (UWisc), 2.05 g m-2 (MODIS) L2 bc-rms: 34 g/m² (AMSR-E) L3 bc-rms : 11.63 g/m² (UWisc), 6.50 g/m² (MODIS)			
Verification method	comparison with satellite-based MWR retrieved LWP over ocean (e.g. LWP_HOAPS), comparison with MODIS		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <84° satellite zenith angle	Pixel resolution level 2 (0.05)² level 3 (0.25)² monthly mean diurnal cycle	n/a	N/A

CM-21061 SEVIRI Ice Water Path ICDR R2			IWP_SEVIRI_DS_R2
Type	Dataset		
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector		
Characteristics and Methods	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle, 1D histograms		
Record length / Period	2004-2015		
Comments	Contains as additional layers: COT (cloud optical thickness), REFF (particle effective radius) , and $H\sigma$ (scene heterogeneity measure)		
Traceability of Requirements	SAF/CM/CDOP2/RR/24 v1.2 dated 13.06.2014		
Input satellite data	SEVIRI (MSG-1, MSG-2, MSG-3)		
Dissemination			
Format	Means	Type	
Netcdf CF (level 3) Hdf5 (level 2)	FTP, WEB	offline	
Accuracy			
Bias: -5.11 g/m² (MODIS) L3 bc-rms: 14.82 g/m² (MODIS)			
Verification method	comparison with CloudSat (2007-2014, level-2, selected months), comparison with MODIS (2004-2014)		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk <84° satellite zenith angle	Pixel resolution level 2 (0.05)² level 3 (0.25)² monthly mean diurnal cycle	n/a	N/A

CM-12002	Microwave Radiance FCDR R3	FCDR_SSMI_DS_R3
Type	Dataset	
Applications and users	* NMS and reanalyses for assimilation * Validation of (climate) models * Basis for TCDR products (from CM SAF, OSI SAF) * Of interest to the soil moisture community	
Characteristics and Methods	swath-based product, imager channels similar to SSM/I	
Record length / Period	1979-2015	
Comments	The dataset contains existing unchanged elements from CM-150 (SSM/I) and CM-12001 (SSMIS). Additionally processed data: SSMIS temporal extension and SMMR full period with unchanged baseline algorithm. Verification might not cover full period. Consistency is given as the total uncertainty of global monthly means for differences to the selected reference. The SSM/I like FCDR also covers land areas. However, the viewing angle correction is not applied over land, and due to likely larger temperature ranges the uncertainty might be increased over land. SMMR quality might be reduced.	
Traceability of Requirements	Ohring et al. 2005; SAF/CM/DWD/RR/2.13; v1.1 dated 19.02.2015	
Input satellite data	SSM/I (CM-150), SSMIS (CM-12001), SMMR (Pafthfinder L1b)	
Dissemination		
Format	Means	Type
Netcdf4 CF	FTP, WEB	offline
Accuracy / Consistency		
Consistency: U < 1K Decadel stability: tD ≤ 0.03K/decade, with t-test significance ≥ 5% and t-test significance ≥ 30% depending on channels and platforms		
Verification method	Reanalysis and/or ground-based observations and RT	
Coverage, resolution and timeliness		

Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	sensor resolution	n/a	N/A

CM-23311	TOA Reflected Solar All-Sky Radiative Flux		TRS_AS_MVIRI_GERB_SEVIRI_disk_DS
Type	Dataset		
Applications and users	* Climate Research * NMHSs * Government Agencies		
Characteristics and Methods	daily mean, monthly mean, monthly mean diurnal cycle		
Record length / Period	01.02.1982-30.04.2015		
Comments			
Traceability of Requirements	SAF/CM/CDOP2/RMIB/GERB/RR2.6, v3.0, dated 24.12.2014		
Input satellite data	MVIRI, SEVIRI		
Dissemination			
Format	Means	Type	
Netcdf CF	FTP, WEB	offline	
Accuracy			
RMS error of the monthly mean: 3.6 W/m² RMS error of the daily mean: 6.5 W/m² MMDC accuracy: 11.0 W/m² Stabilty: < 4 W/m²			
Verification method	comparison with CERES/AVHRR. Accuracy at 1°x1° resolution.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)²	n/a	N/A

CM-23341	TOA Emitted Thermal All-Sky Radiative Flux		TET_AS_MVIRI_GERB_SEVIRI_disk_DS_R1
Type	Dataset		
Applications and users	* Climate Research * NMHSs * Government Agencies		
Characteristics and Methods	daily mean, monthly mean, monthly mean diurnal cycle		
Record length / Period	01.02.1982-30.04.2015		
Comments			
Traceability of Requirements	SAF/CM/CDOP2/RMIB/GERB/RR2.6, v3.0, dated 24.12.2014		
Input satellite data	MVIRI, SEVIRI (reprocessed CF version)		
Dissemination			
Format	Means	Type	
Netcdf CF	FTP, WEB	offline	
Accuracy			
RMS error of the monthly mean 2.6 W/m² RMS error of the daily mean: 4.2 W/m² MMDC accuracy: 3.5 W/m² Stabilty: < 4 W/m² (except for Jan-March 1987 which are flagged)			
Verification method	comparison with CERES/HIRS dataset/AVHRR. .Accuracy at 1°x1° resolution.		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Meteosat disk	(0.05°)²	n/a	N/A

CM-11011	AVHRR GAC Fractional Cloud Cover TCDR R2	CFC_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector	
Characteristics and Methods	daily level2b files (per satellite in asc./desc. node), daily mean, monthly mean Method improvements concern mainly better detection of Cirrus and fractional low clouds in the sub-tropical region.	
Record length / Period	1982-2015	
Comments	The accuracy is defined as the mean error (i.e., defined in % cloud amount units) and precision is defined as the bias-corrected RMS error. For polar areas products will be provided in EASE-grid (5km for level2, 25 km for level3)).	
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	
Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	Offline
Accuracy		
monthly bias: -3.2 % CFC daily bias: -3.2 % bc-rms daily, monthly: 6.7 – 10 % Decadal stability: -1.3 %		
Verification method	Primarily comparisons with SYNOP and Cloudsat/CALIPSO (2006-2013), consistency checks against MODIS, ISCCP and PATMOS-X. Validation results are shown separately for Polar winter region (above 70° latitude in S/N Hemispheric winter) where results may have some problems to meet the listed requirements during the Polar winter.	

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	(0.05)² level2b, (0.25)² level3	n/a	N/A

CM-11021	Joint Cloud Histograms AVHRR GAC TCDR R2	JCH_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	* Climate Research	
Characteristics and Methods	Monthly histograms of Cloud top pressure and cloud optical depth. This product is a combination of COT (from CM-11051), CPH (CM-11041) and CTO (CM-11031) and depends on the accuracy of these products.	
Comments	Time series from 1982-2015	
Generation frequency	SAF/CM/DWD/RR2.2 v1.1, dated 17.06.2014	
Input satellite data	CTO (CM-11031), COT (from CM-11051), CPH (CM-11041)	

Dissemination		
Format	Means	Type
Netcdf CF	FTP	offline

Accuracy		
Threshold	Target	Optimal
n/a	n/a	n/a
Verification method		

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(1°)^2$	n/a	N/A

CM-11031	AVHRR GAC Cloud Top Level TCDR R2	CTO_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector	
Characteristics and Methods	daily level2b files (per satellite in asc./desc. node), daily mean, monthly mean	
Record length / Period	1982-2015	
Comments	CTT: no specific requirement as it represents same information in different units	
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy
monthly, daily bias: 840 m monthly, daily bias: -56 hPA – 32.9 hPa monthly, daily bc-rms: 2380 m monthly, daily bc-rms: 11 – 88 hPa Decadal Stability: n/a decadal Stability: -4.0 hPa
Verification method: comparison with ISCCP, PATMOS-X, MODIS (2000-2013), Cloudsat/Calipso (2007-2013)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global	$(0.05)^2$ level2b, $(0.25)^2$ level3 polar areas in EASE-grid (5km for level2, 25 km for level3)).	n/a	N/A

CM-11041	AVHRR GAC Cloud Phase TCDR R2	CPH_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	* Climate Research * NMHSs * Government Agencies	
Characteristics and Methods	daily level2b files (per satellite and ascending/descending node), daily mean, monthly mean	
Record length / Period	1982-2015	
Comments		
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy
monthly, daily bias 0.01 – 0.09 monthly, daily bc-rms: 0.06 – 0.16 decadal stability: 0.016 – 0.022
Verification method: comparison with ISCCP, PATMOS-X, MODIS (2000-2013), Cloudsat/Calipso (2007-2013)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global (day and night)	(0.05)² level2b (0.25)² level3 For polar areas products also provided in EASE-grid 25 km (level 3).	n/a	N/A

CM-11051	AVHRR GAC Liquid Water Path TCDR R2	LWP_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector	
Characteristics and Methods	daily level2b files (per satellite in asc./desc. node), daily mean, monthly mean	
Record length / Period	1982-2015	
Comments	Contains as additional layers: COT (cloud optical thickness) and REFF (particle effective radius). Accuracy requirements hold for global monthly mean all-sky LWP. Accuracies over the polar regions (very limited availability of daytime data and retrievals are made over snow/ice-covered conditions) are expected to be worse.	
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy
monthly, daily bias: -3.4 – -0.5 gm-2 and -10 – 17 gm-2 monthly, daily bc-rms: 11 – 20 gm-2 Decadal Stability: 1.0 – 2.3 gm-2
Verification method: Validation with satellite-based MWR retrieved LWP over ocean, comparison with ISCCP, PATMOS-X, MODIS (2000-2013)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global (daytime)	(0.05)² level2b, (0.25)² level3	n/a	N/A

CM-11061	AVHRR GAC Ice Water Path TCDR R2	IWP_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	Climate Research, NMHSs & Government Agencies, Private & Public Sector	
Characteristics and Methods	daily level2b files (per satellite in asc./desc. node), daily mean, monthly mean	
Record length / Period	1982-2015	
Comments	Contains as additional layers: COT (cloud optical thickness) and REFF (particle effective radius). Accuracy requirements hold for global monthly mean all-sky IWP. Accuracies over the polar regions (very limited availability of daytime data and retrievals are made over snow/ice-covered conditions) are expected to be worse.	
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy
monthly, daily bias: -0.6 – 5.1 gm-2 and -7.4 – 8.6 gm-2 monthly, daily bc-rms: 20 – 31 gm-2 Decadal Stability: 2.7 – 3.7 gm-2
Verification method: Validation with Cloudsat/Calipso (2007-2013), comparison with ISCCP, PATMOS-X, MODIS (2000-2013)

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
Global (daytime)	(0.05)² level2b (0.25)² level3	n/a	N/A

CM-11201	AVHRR GAC Surface Incoming Shortwave Radiation TCDR R2	SIS_AVHRR_global_DS_R2
Type	Dataset	
Applications and users	* Climate impact analysis (DWD,EURO4M,PIK) *Climate model evaluation and development (DWD,EURO4M) * Climate change analysis (WMO-RCC,EURO4M) * Development agencies (GTZ) * Agricultural planning and drought risk assessment (GTZ, Univ. Bologna) * Solar energy (JRC)	
Characteristics and Methods	monthly means, daily means	
Record length / Period	1982-2015	
Comments		
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014	
Input satellite data	AVHRR GAC	

Dissemination		
Format	Means	Type
Netcdf CF	FTP, Web	offline

Accuracy
MAB monthly: 9.5 W/m² MAB daily: 18.9 W/m² Decadal Stability: 1.2 W/m²
Verification method: comparison with BSRN

Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	0.25x0.25 °	n/a	N/A

	products in EASE-grid (25 km for level3).		

CM-11221	AVHRR GAC Surface Albedo TCDR R2		SAL_AVHRR_global_DS_R2
Type	Dataset		
Applications and users	* Climate Research * NMHSs * Government Agencies		
Characteristics and Methods	pentad mean, monthly mean Topography correction is carried out for both geolocation and radiometry based on high-resolution DEM from SRTM where available and GEOTOPO30 elsewhere. Dynamic aerosol correction is foreseen to be implemented based on indirect estimation of AOD at 550 nm from UV-band satellite measurements of the atmosphere. Detailed descriptions will be made available in the PUM and ATBD of CM-11221.		
Record length / Period	1982-2015		
Comments			
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014		
Input satellite data	AVHRR GAC		
Dissemination			
Format	Means	Type	
Netcdf CF	FTP, Web	offline	
Accuracy			
mean relative retrieval error: -0.6 % Decadal stability: 8.5 %			
Verification method	Comparison with surface measurements for different regions +comparisons with albedo estimations from other platforms		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	(0.25)² level3 For polar areas	n/a	N/A

CM-11251	AVHRR GAC Surface Outgoing Longwave Radiation TCDR R2		SOL_AVHRR_global_R2
Type	Dataset		
Applications and users	* Climate Monitoring and Analysis (EURO4M) * NWP & climate model validation (DWD, COSMO CLM)		
Characteristics and Methods	monthly means		
Record length / Period	1982-2015		
Comments			
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014		
Input satellite data	AVHRR GAC		
Dissemination			
Format	Means	Type	
Netcdf CF	FTP, Web	offline	
Accuracy			
MAB monthly: 13.7 W/m² Decadal Stability: 0.5 W/m²			
Verification method	comparison with BSEN		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	0.25x0.25 °	n/a	N/A

CM-11261	AVHRR GAC Surface Downwelling Longwave Radiation TCDR R2		SDL_AVHRR_global_DS_R2
Type	Dataset		
Applications and users	* Climate Monitoring and Analysis (EURO4M) * NWP & climate model validation (DWD,COSMO CLM)		
Characteristics and Methods	monthly means		
Record length / Period	1982-2015		
Comments			
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014		
Input satellite data	AVHRR GAC		
Dissemination			
Format	Means	Type	
Netcdf CF	FTP, Web	Offline	
Accuracy			
MAB monthly: 7.9 W/m² Decadal Stability: 0.4 W/m²			
Verification method	comparison with BSEN		
Coverage, resolution and timeliness			
Spatial coverage	Spatial resolution	Vertical resolution	Timeliness
global	0.25x0.25 °	n/a	N/A