EUMETSAT Satellite Application Facility on Climate Monitoring



CDOP 2 Service Specifications

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Document Signature Table

	Name	Function	Signature	Date
Author	Petra Fuchs	Head of CM SAF		20. January 2017
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Approval	SG			15. February 2017
Release	Martin Werscheck	Project Manager		15. February 2017

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Issue/ Revision	Date	DCN No.	Changed Pages/Paragraphs
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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)
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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



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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)



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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	1.4	SAF/CM/DWD/PUM/WVT
	Vapour and Temperature from		
RD 3	ATOVS	4.0	
	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



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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



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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.



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"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.



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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.

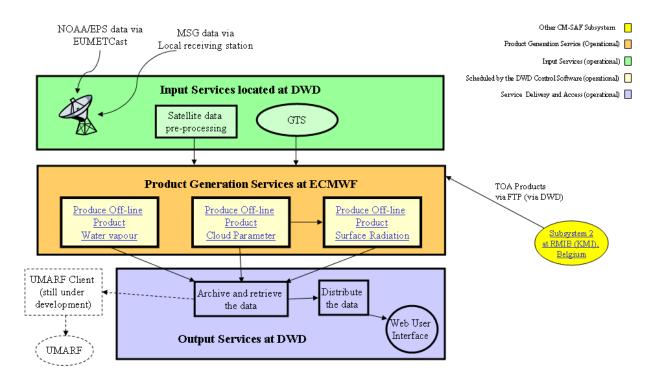


Figure 2.1: CM SAF Operational Service Architecture at DWD



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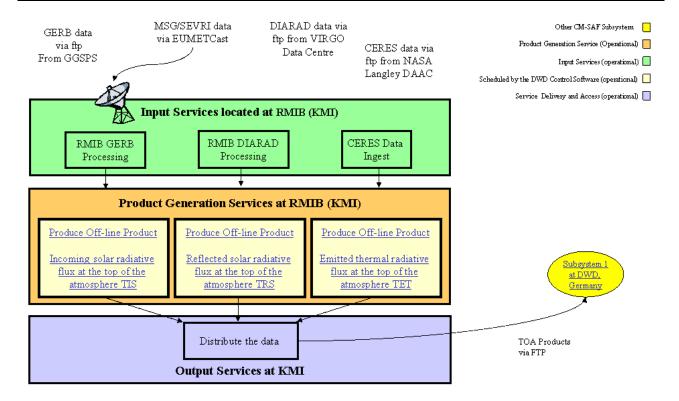


Figure 2.2: CM SAF Operational Service Architecture at RMIB



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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.

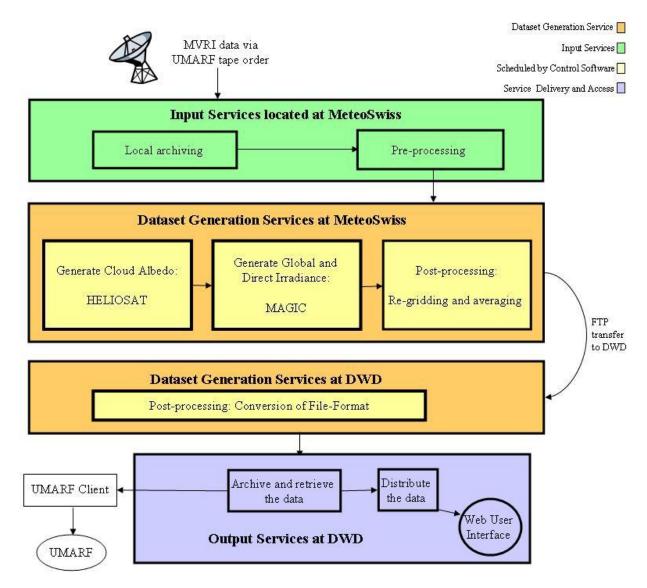


Figure 2.3: Architecture to generate surface radiation data sets based on MVIRI



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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.

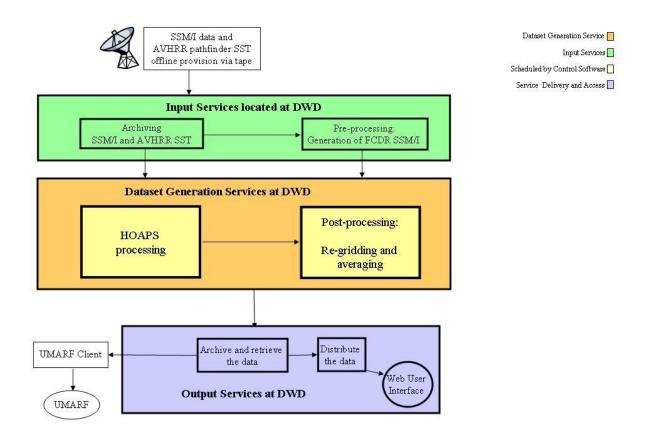


Figure 2.4: Architecture to generate the HOAPS climate data records.



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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.

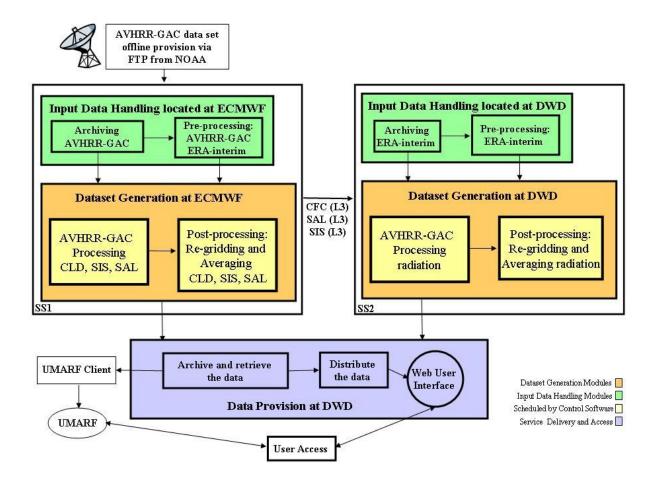


Figure 2.5: System architecture to generate the AVHRR-GAC (CLARA) climate data records.



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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.

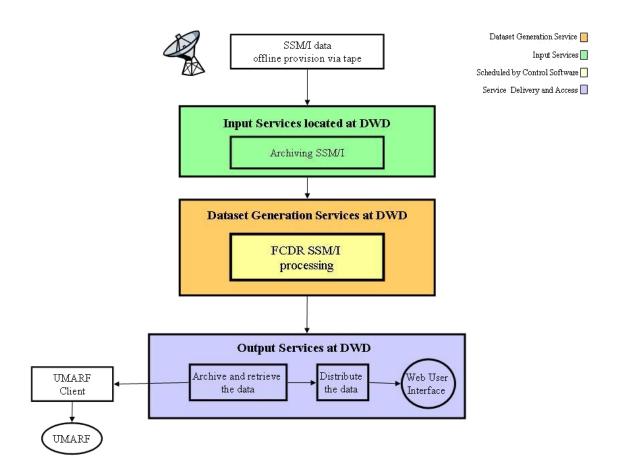


Figure 2.6: System architecture to generate the FCDR SSM/I data set.



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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.

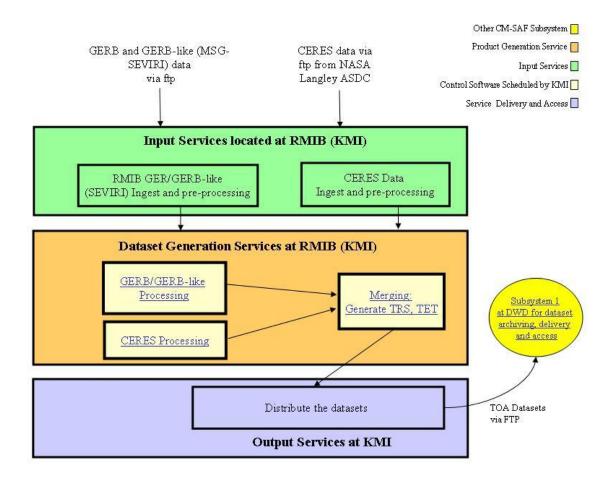


Figure 2.7: System architecture to generate the the GERB climate data set.



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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.

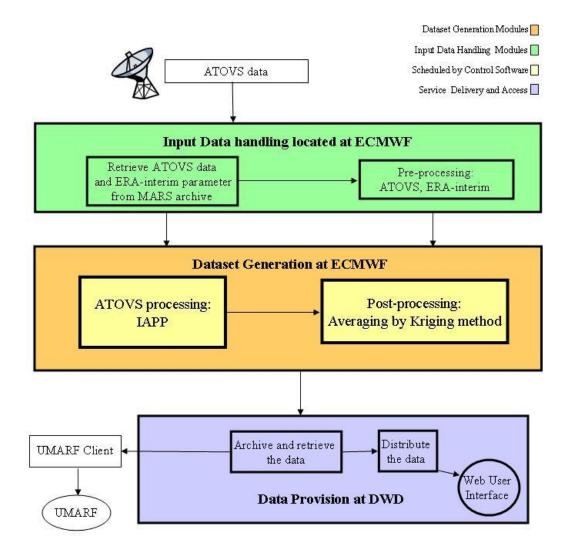


Figure 2.8: System architecture to generate the ATOVS climate data set.



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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.

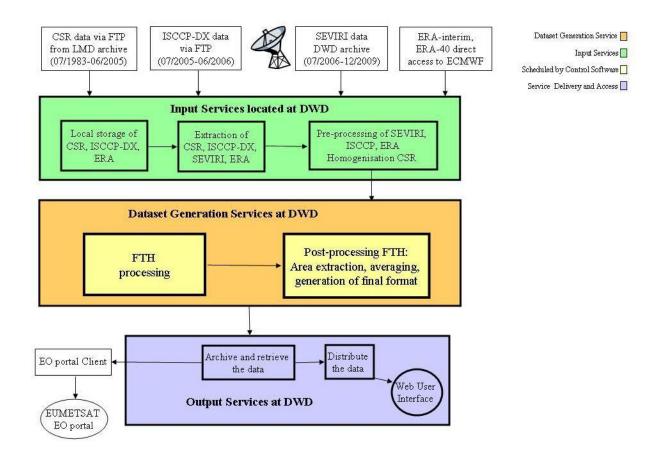


Figure 2.9: System architecture to generate the FTH climate data set.



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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.

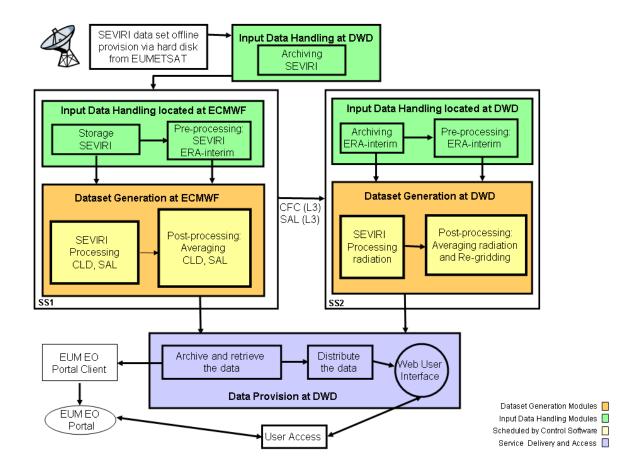


Figure 2.10: System architecture to generate the SEVIRI CLAAS data set and the SEVIRI cloud mask data set.



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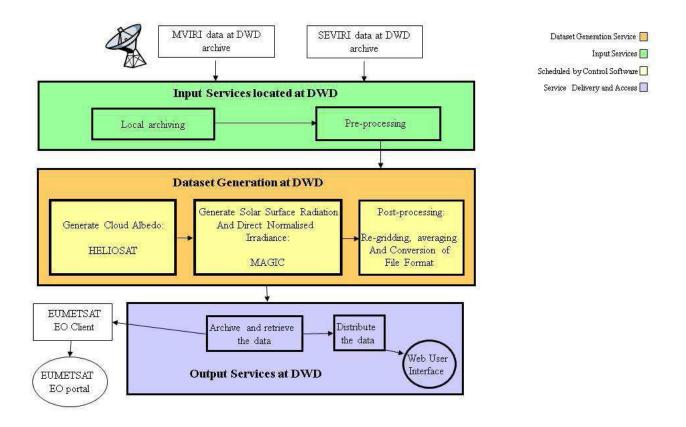
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2.10. Architecture to generate the SARAH radiation data set

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.



MVIRI/SEVIRI ed.2

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



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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.

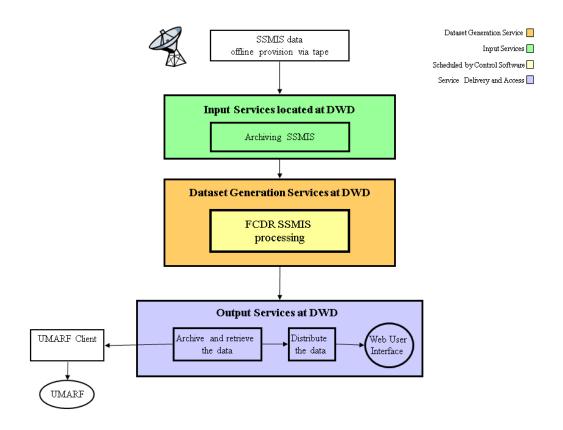


Figure 2.12: System architecture to generate the FCDR SSM/I + SSMIS data set.



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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.

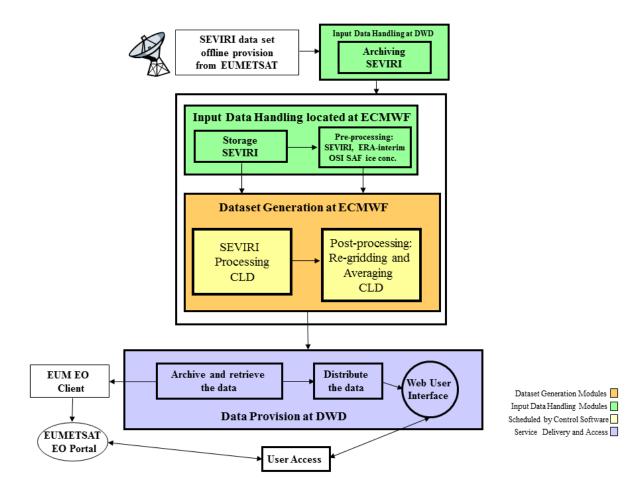


Figure 2.13: System architecture to generate the CLAAS-2 CDR.



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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.

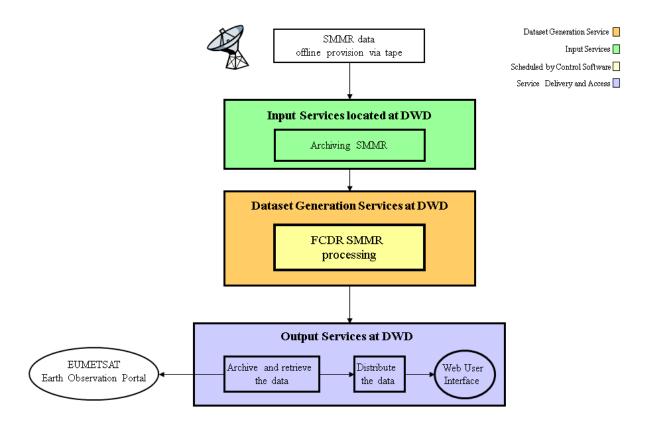


Figure 2.14: System architecture to generate FCDR Microwave Imager Radiances.



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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

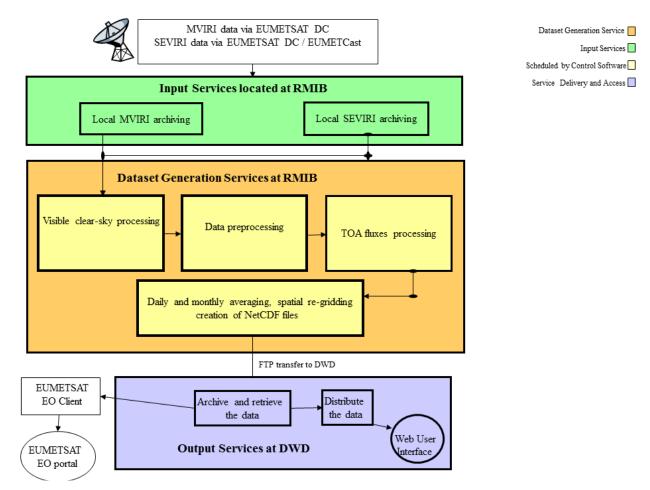


Figure 2.15: System architecture to generate Top of the atmosphere radiation budget MVIRI/SEVIRI.



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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.

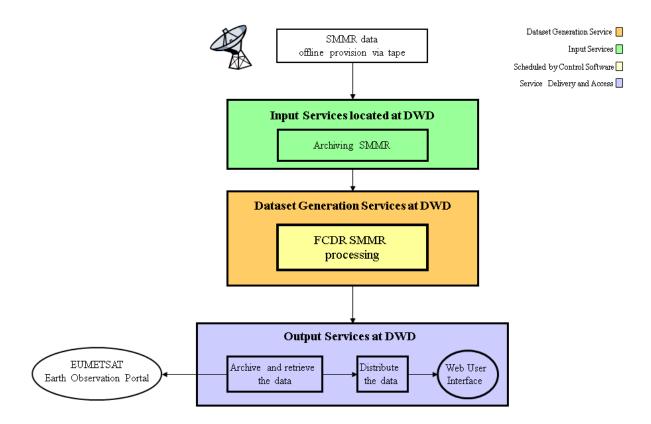


Figure 2.16: System architecture to generate AVHRR GAC (CLARA-A2).



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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

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

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

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

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.



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- **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:



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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



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4.16. Scientific Developments

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

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



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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.



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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



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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	Fraction	onal Cl	oud Cover			CFC_SEVIRI			
Туре			Product						
Applications and users									
Characteristics and Methods			Daily Mean, M	Monthly Mean,	Month	ly 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 biascorrected RMS error.						
Generation frequency			1 day, 1 mon	1 day, 1 month					
Input satellite data			SEVIRI						
			Dissemi	nation					
Format			Means			Туре			
HDF5 FTP, 0		FTP, CD-ROM, Email			offline				
			Accur	асу					
±10% (cloud amount ±15% over oceanic a For viewing angles >	and trop			egions					
Verification method			parisons to SYNOP data (results computed as areal means the studied area)						
		Cover	age, resolution	on and timelin	ess				
Spatial coverage	Spatia	l resolu	ution	Vertical resolution		Timeliness			
Meteosat disk (15 km) ²						2 month			

CM-03 Fractional Cloud Cover CFC_AVHRR_Euro								
Туре			Product					
Applications and users								
Characteristics and	Meth	ods	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 biascorrected RMS error.					
Generation frequency			1 day, 1 mo	nth				
Input satellite data			AVHRR					
Dissemination								
Format			Means			Туре		
HDF5 FTP,			P, CD-ROM, Email off)		
Accuracy								
±10% (cloud amour ±15% over oceanic For viewing angles	and t	ropica						
Verification method		parisons to MODIS data (results computed as areal means over tudied area)						
Coverage, resolution and timeliness								
Spatial coverage	Spatial reso		lution	Vertical resolution		Timeliness		
Europe	(15 kr	n) ²	·			2 month		



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CM-04 Fract	ional Cloud Cover	•	CFC_AVHRR_Arctic				
Туре	Product						
Applications and us	* Climate * NMHSs	* Climate Research * NMHSs					
Characteristics and Methods	Daily Mea Monthly M						
Comments	in % cloud	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 frequer	1 day, 1 r	1 day, 1 month					
Input satellite data	AVHRR	AVHRR					
	D	isseminati	on				
Format	Mean	S	Туре				
HDF5	FTP, CD-ROM, E	Email	offline				
		Accuracy					
±30% (absolute)							
Verification method	SYNOP but complemented with MODIS and Cloudsat/CALIPSO ith comparison to ARM site data and						
	Coverage, re	solution a	nd timeliness				
Spatial coverage Spat	ial resolution	Vertical resolution	Timeliness				

CM-08	Cloud	Туре				CTY_SEVIRI			
Туре			Product						
Applications and users									
Characteristics and Methods			Daily Mean,	Monthly Mean,	Month	nly 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 Biascorrected RMS error.						
Generation frequency			1 day, 1 mon	1 day, 1 month					
Input satellite data			SEVIRI						
			Dissem	ination					
Format			Means	•	Туре				
HDF5		FTP, 0	P, CD-ROM, Email			offline			
			Accu	ıracy					
±30% bias (cloud ar For viewing angles >									
Verification method			arisons to MODIS data (results computed as areal means ne studied area)						
		Cove	rage, resoluti	on and timeli	ness				
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness			
Meteosat disk	k (15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012			



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CM-10	Cloud	І Туре				CTY_AVHRR_Arctic		
Туре			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					
			Dis	seminatio	n			
Forma	at		Means			Type		
HDF5 FTP,		CD-ROM, E	mail	offline				
		•	A	ccuracy				
±30% (absolute	e)							
Verification method								
		Cove	rage, resc	olution and	d tim	eliness		
Spatial coverage	Spat	ial res	solution	Vertical resolution		Timeliness		
Arctic	rctic (15 km)²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012		

CM-09			-	CTY_AVHRR_Europe			
Туре			Product				
Applications and u	sers						
Characteristics and	d Meth	ods	Daily Mean,	Monthly Mea	an		
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 mo	nth			
Input satellite data			AVHRR				
			Diss	semination			
Format		Means		Type			
HDF5 FTP,		CD-ROM, Email			offline		
		Accuracy					
±30% bias (cloud a For viewing angles		,			oups.		
			parisons to MODIS data (results computed as areal means over udied area)				
		Co	verage, resc	lution and t	imeliı	ness	
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	



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CM-14	Cloud	Тор				CTO_SEVIRI	
Туре			Product				
Applications and use	ers						
Characteristics and	Method	S	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				
			Dissemi	nation			
Format			Means		Туре		
HDF5		FTP, 0	CD-ROM, Ema	ail	offline		
			Accur	асу			
CTP: ±190 hPa (bias same information in			equirement se	et for CTT and	CTH a	s they represent the	
Verification method			arisons to MODIS data (results computed as areal means he studied area)				
		Cover	age, resolutio	on and timelin	ess		
Spatial coverage	Spatia	l resolu	ıtion	Vertical resolu	ution	Timeliness	
Meteosat disk	(15 km	1) 2			•	2 month	

CM-15	Cloud 1	Тор				CTO_AVHRR_Europe	
Type			Product				
Applications and u	sers						
Characteristics and Methods			Daily Mean and Monthly Mean for: Cloud Top Temperature (CTT) Cloud Top Height (CTH) Cloud Top Pressure (CTP)				
Comments							
Generation freque	ncy		1 day, 1 mo	nth			
Input satellite data	l		AVHRR				
			Diss	semination			
Format			Means			Туре	
HDF5	F	TP,	CD-ROM, Er	nail	offline		
	•		Α	ccuracy	•		
CTP: ± 100 hPa (b				ent set for C1	ΓT and	CTH as they represent the	
Verification method			parisons to MODIS data (results computed as areal means over udied area)				
		Со	verage, resc	olution and t	imelin	ess	
Spatial coverage	Spatial	reso	lution	Vertical resolution		Timeliness	
Europe	(15 km)) 2				2 month	



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CM-16	Cloud	I Тор			•	CTO_AVHRR_Arctic		
Туре			Product					
Applications and	d user	'S	* Climate * NMHSs	* Climate Research * NMHSs				
Characteristics 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 freq	uency	/	1 day, 1 month					
Input satellite d	lata		AVHRR	AVHRR				
			Dis	seminatio	n			
Format			Means			Туре		
HDF5		FTP,	CD-ROM, Email off			offline		
			, ,	Accuracy				
CTP ±100 hPa.No information in diffe			uirement set	for CTT and	CTH a	as they represent the same		
Verification met	:hod		parisons to ns over the		•	sults computed as areal		
		Cove	erage, res	olution an	d tim	eliness		
Spatial coverage	Spat	ial res	solution	Vertical resolution		Timeliness		
Arctic	(15 k	km)²				2 month		

CM-32	Cloud	Optica	al Thickness			COT_SEVIRI	
Туре			Product				
Applications and us	ers		* Climate Research * NMHSs * Government agencies				
Characteristics and	Method	ds	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 frequen	су		1 day, 1 month				
Input satellite data			SEVIRI				
			Dissem	ination			
Format			Means	Туре			
HDF5		FTP, 0	CD-ROM, Ema	ail	offline		
		=	Accu	racy			
bias: 40% rms: 70%							
Verification method		Comp	arisons to MO	DIS data			
		Cove	rage, resoluti	on and timeli	ness		
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness	
Meteosat disk	(15 km	n) ²				Product discontinued on 01.03.2012 Products are only available until 28.02.2012	



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CM-33	Cloud	Optio	al Thicknes	s		COT_AVHRR_Europe	
Туре			Product				
Applications and u	sers		* Climate Research * NMHSs * Government agencies				
Characteristics and	d Meth	ods	Daily Mean,	Monthly Mea	an		
Comments			The bias and rms are defined for the baseline area as relative difference to the comparative datasets.				
Generation freque	1 day, 1 month						
Input satellite data			AVHRR				
			Diss	semination			
Format			Means			Туре	
HDF5		FTP,	CD-ROM, Er	nail	offline		
			Α	ccuracy			
bias: 40% rms: 70%							
Verification method	d	Comp	arisons to M	ODIS data			
		Co	verage, resc	lution and t	imelin	ess	
Spatial coverage	Spatia	al reso	lution	Vertical resolution		Timeliness	
Europe	(15 kr	n) ²		_		2 month	

CM-36	Cloud	Phase				CPH_SEVIRI		
Туре			Product					
Applications and use	ers		* Climate Research * NMHSs * Government agencies					
Characteristics and	Method	ds	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 frequence	СУ		1 day, 1 mon	1 day, 1 month				
Input satellite data			SEVIRI					
			Dissem	ination				
Format			Means	•	Туре			
HDF5		FTP, 0	CD-ROM, Ema	ail	offline	ine		
		-	Accu	racy	ė.			
bias: 0.1 rms: 0.2								
Verification method		Comp	arisons to MO	DIS data				
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk	(15 km	n) ²				Product discontinued on 01.03.2012 Products are only available until 28.02.2012		



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Spatial coverage

Meteosat disk

Spatial resolution

(15 km) ²

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CM-41 Liquid	d Water	Path	LWP_SEVIRI		
Туре		Product			
Applications and users		* Climate Research * NMHSs * Government agencies			
Characteristics and Metho	ds	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	Туре		
HDF5	FTP, 0	CD-ROM, Email	offline		
	-	Accuracy			
bias: 40% rms: 70%					
Verification method	Comp	arisons to MODIS data			
	Cove	rage, resolution and timeli	ness		

Vertical resolution

Timeliness

Product discontinued

on 01.03.2012 Products are only available until 28.02.2012

CM-37	Cloud	I Phase			CPH_AVHRR_Europe		
Туре		Product			·		
Applications and u	isers	* NMHS	* Climate Research * NMHSs * Government agencies				
Characteristics an	d Meth	ods Daily Mea	an, Monthly Me	an			
Comments		absolute	The bias and rms are defined for the baseline area as absolute difference (of water cloud fraction) to the comparative datasets.				
Generation freque	ncy	1 day, 1 i	day, 1 month				
Input satellite data	l	AVHRR	AVHRR				
			Dissemination				
Format		Mea	ans	Туре			
HDF5		FTP, CD-ROM,	Email	offline	offline		
			Accuracy	*			
bias: 0.1 rms: 0.2							
Verification metho	d	Comparisons to	MODIS data				
		Coverage, r	esolution and	timelir	ness		
Spatial coverage	Spatia	al resolution	Vertical resolution		Timeliness		
Europe	(15 kr	n) ²			2 month		



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CM-42	Liquio	l Wate	er Path			LWP_AVHRR_Europe	
Туре			Product			-	
Applications and u	Applications and users			* Climate Research * NMHSs * Government agencies			
Characteristics and	d Meth	ods	Daily Mean,	Monthly Mea	an		
Comments				The bias and rms are defined for the baseline area as relative difference to the comparative datasets.			
Generation freque	ncy		1 day, 1 month				
Input satellite data	I		AVHRR				
			Diss	semination			
Format			Means			Туре	
HDF5		FTP,	CD-ROM, Er	nail	offline)	
			Α	ccuracy			
bias: 40% rms: 70%							
Verification method	d	Comp	arisons to M	ODIS data			
		Co	verage, reso	olution and t	imelin	ess	
Spatial coverage	Spatia	al reso	lution	Vertical resolution		Timeliness	
Europe	(15 kr	n) ²				2 month	

CM-49	Surfac	e inco	ming shortwa	ve radiation		SIS_SEVIF		
Туре			Product	Product				
Applications and use	rs							
Characteristics and Methods			Daily Mean, N	Nonthly Mean,	Monthl	y Mean Diurnal Cycle		
Comments								
Generation frequency			1 day, 1 month					
Input satellite data			SEVIRI/GERE	3				
			Dissemir	nation				
Format			Means			Type		
HDF5		FTP, 0	CD-ROM, Ema	il	offline			
			Accura	асу				
90 per cent of absolumeasurements) for m Bias of 20 W/m² for or regions, e.g. due to u	nonthly daily me	means eans. H	igher bias valu	es occur in the	, ,	ound based and other mountainous		
Verification method		compa	arison with in-s	itu measureme	ents			
		Cover	age, resolutio	n and timeline	ess			
Spatial coverage	Spatia	l resolu	resolution Vertical resolution Timeliness					
Meteosat disk	(15 km	1) ²				2 month		



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CM-51	Surfac	e inco	ming shortwa	ave radiation		SIS_mer		
Туре			Product					
Applications and use	ers							
Characteristics and	Method	ls	Merged product Monthly Mean					
Comments	Comments							
Generation frequence	СУ		1 month					
Input satellite data			SEVIRI/GER	B, AVHRR				
			Dissem	ination				
Format			Means			Type		
HDF5		FTP, 0	CD-ROM, Email offline					
			Accu	racy				
10 W/m² monthly mo	ean, for	details	see compone	ents				
Verification method		compa	arison with in-s	situ measurem	ents			
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ıtion	Vertical resol	ution	Timeliness		
Meteosat disk and Northern Europe	(15 km	n) ²				Product discontinue on 01.03.2012 Products are only available until 28.02.2012		

CM-50	Surfac	ce inc	oming short	wave radiation	on	SIS_AVHRR_E	urope		
Туре			Product						
Applications and us	ers								
Characteristics and	aracteristics and Methods			Monthly Mea	ın				
Comments			due to the lower resolution in space-time, the daily means have a lower accuracy than the MSG based product						
Generation frequen	су		1 day, 1 mor	nth					
Input satellite data			AVHRR						
	Dissemination								
Format			Means			Type			
HDF5		FTP,	CD-ROM, Em	nail	offline)			
			Ac	ccuracy					
90 per cent of abso measurements) for Bias of 20 W/m² for regions, e.g. due to	month daily	nly means	ans. s. Higher bias	values occu	r in the	y of ground based Alpine and other mounta	ainous		
Verification method		comp	arison with in-situ measurements						
		Cov	verage, reso	lution and ti	meline	ess			
Spatial coverage	Spatia	al resol	lution	Vertical reso	lution	Timeliness			
Europe	(15 kr	n) ²				2 month			



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CM-56	Surfac	e Albe	edo		•	SAL_SEVIRI		
Туре			Product	Product				
Applications and us	ers							
Characteristics and	Method	ls	Weekly Mear	n, Monthly Mea	an			
Comments								
Generation frequen	су		1 week, 1 mc	onth				
Input satellite data			SEVIRI					
			Dissem	ination				
Format			Means			Туре		
HDF5		FTP, 0	FTP, CD-ROM, Email					
			Accu	racy				
25% (relative). High	er devi	ations i	n desert regio	ns are expecte	ed.			
Verification method		campa missin attemp	tinuous validation at mast measurement sites & field paigns. Comparisons over Africa are very limited due to sing mast data. Comparisons to other satellite data are mpted. It is expected that the quality of SAL is not reduced spt in desert regions.					
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk	Meteosat disk (15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012		

CM-57	Surfa	ce Alb	edo	•		SAL_AVHRR_Europe		
Туре			Product					
Applications and u	sers							
Characteristics and	d Meth	ods	Weekly Mea	n, Monthly M	1ean			
Comments								
Generation freque	Generation frequency 1 week, 1 m							
Input satellite data			AVHRR	AVHRR				
Dissemination								
Format			Means	;		Туре		
HDF5		FTP,	CD-ROM, Er	nail	offline			
			Α	ccuracy				
25% (relative). Hig	her de	viation	s in desert re	egions are ex	pected	i.		
Verification method	d	Conti	nuous validat	ion at mast n	neasur	rement sites & field campaigns		
		Co	verage, resc	lution and ti	imelin	ess		
Spatial coverage Spatial resolution			lution	Vertical resolution		Timeliness		
Europe	(15 kr	n) ²				2 month		



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CM-58	Surfac	e Albe	do			SAL_merged	
Туре			Product	Product			
Applications and us	ers						
Characteristics and Methods			Merged Prod	uct, Monthly N	1ean		
Comments							
Generation frequency			1 month				
Input satellite data			SEVIRI, AVH	IRR			
			Dissem	ination			
Format			Means			Туре	
HDF5		FTP, (, CD-ROM, Email			9	
			Accuracy				
25% (relative). High	er devi	ations i	n desert regio	ns are expecte	ed.		
Verification method			nuous validation at mast measurement sites & field aigns of the components CM-57 and CM-56.				
		Cove	rage, resoluti	on and timeli	ness		
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness	
Meteosat disk, Northern Europe	(15 km	n) ²				Product discontinued on 01.03.2012 Products are only available until 28.02.2012	

CM-59	Surfa	ce Alb	edo		•	SAL_AVHRR_Arctic		
Туре			Product					
Applications and	d user	rs	* Climate * NMHSs * Governm	Research nent agenci	es			
Characteristics Methods	and		Weekly Me Monthly M					
Comments			Per definit Septembe		rodu	ct only available from April to		
Generation frequency			1 week, 1	1 week, 1 month				
Input satellite d	ata		AVHRR					
			Dis	seminatio	n			
Format			Means			Type		
HDF5		FTP,	CD-ROM, Email off			fline		
			P	Accuracy				
25 % (relative)								
Verification method			inuous validation at mast measurement sites & field paigns					
		Cove	rage, reso	olution and	d tim	eliness		
Spatial coverage	' ISpatial res		solution Vertical resolution			Timeliness		
Arctic	(15 l	cm) ²				2 month		



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CM-64	Surfac	e Net	Shortwave Ra	adiation		SNS_SE	VIRI
Туре	-		Product				
Applications and use	ers						
Characteristics and Methods			Daily Mean, I	Monthly Mean	Month	nly Mean Diurnal Cycle	
Comments							
Generation frequency			1 day, 1 mon	th			
Input satellite data			SEVIRI/GER	В			
			Dissem	ination			
Format			Means	;	Туре		
HDF5		FTP, 0	CD-ROM, Ema	ail	offline		
		=	Accuracy				
15 W/m² 25 W/m² da	aily me	an, see	components	for details			
Verification method		calcul	ated based on	accuracy of S	AL and	d SIS	
		Cove	rage, resoluti	on and timeli	ness		
Spatial coverage	Spatia	al resolu	ution	Vertical resol	ution	Timeliness	
Meteosat disk	(15 kn	n) ²				Product discontinue on 01.03.2012 Products are only available until 28.02.2012	d

CM-65	Surfa	ce Net	Shortwave	Radiation		SNS_AVHRR_Europe		
Туре			Product					
Applications and u	Applications and users							
Characteristics and	d Meth	ods	Daily Mean,	Daily Mean, Monthly Mean				
Comments								
Generation freque	ncy		1 day, 1 mo	nth				
Input satellite data			AVHRR					
Dissemination								
Format			Means			Туре		
HDF5		FTP,	CD-ROM, Email offli			ffline		
		ë	Α	ccuracy	ė			
15 W/m² 30 W/m²	daily n	nean, s	see compone	nts for details	3			
Verification method	d	calcul	ated based o	n accuracy c	of SAL	and SIS		
		Co	verage, resc	lution and t	imelin	ess		
Spatial coverage	Spatial resolution		Vertical resolution		Timeliness			
Europe	(15 kr	n) ²			-	2 month		



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CM-66	Surfac	e Net	Shortwave Ra	adiation		SNS_merged
Туре	-		Product			
Applications and use	ers					
Characteristics and Methods			Merged prod	uct Monthly M	ean	
Comments						
Generation frequency			1 month			
Input satellite data			SEVIRI, AVH	IRR		
Dissemination						
Format			Means			Type
HDF5		FTP, 0	CD-ROM, Ema	ail	offline	
			Accuracy			
15 W/m² monthly me	ean, se	e comp	onents for de	tails.		
Verification method		calcula	ated based on	accuracy of S	AL and	d SIS
		Cove	rage, resoluti	on and timeli	ness	
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness
Meteosat disk, Northern Europe	(15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012

CM-71	Surfac	e Outo	going Longwa	ave Radiation	ı		SOL_SEVIRI	
Туре	-		Product	Product				
Applications and us	ers							
Characteristics and Methods			Monthly Mea	n, Monthly Me	an Diu	rnal Cycle		
Comments								
Generation frequer	су		1 month					
Input satellite data			NWP (SEVIR	RI)				
			Dissem	ination				
Format			Means	Type				
HDF5		FTP, (CD-ROM, Ema	offline	;			
		Ė	Accu	racy	ë			
measurements) for	monthly	/ mean	s. Higher bias	s below 10 W/m² (+ uncertainty of ground based s. Higher bias values occur in the Alpine and other incertainties in area to point comparison.				
Verification method		compa	arison with in-	rison with in-situ measurements				
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk (15 km) ²						Product di on 01.03.20 Products a available u 28.02.2012	are only intil	



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CM-72	Surfa	ce Ou	tgoing Long	wave Radiat	ion		SOL_	AVHRR	Europe
Туре	-		Product						
Applications and u	Applications and users								
Characteristics an	d Meth	ods	Monthly Mea	an					
Comments									
Generation freque	ncy		1 month						
Input satellite data	1		NWP (AVHF	RR)					
			Diss	semination					
Format			Means		Туре				
HDF5		FTP,	CD-ROM, Er	nail	offline	fline			
		Ë	А	ccuracy					
measurements) fo	r mont	hly me	ans. Higher b	ues below 10 W/m² (+ uncertainty of ground based ans. Higher bias values occur in the Alpine and other to uncertainties in area to point comparison.					
Verification metho	d	comp	arison with in	arison with in-situ measurements					
		Co	verage, resc	lution and t	imelin	ess			
Spatial coverage	Spatial resolution			Vertical resolution		Timeliness			
Europe	(15 km) ²					Product 01.03.20 Product until 28.	12 s are	only ava	

CM-73	Surfac	e Outo	going Longwa	ave Radiation	l	SOL_merged	
Туре	_		Product				
Applications and use	ers						
Characteristics and	Method	ls	Monthly Mea	Monthly Mean			
Comments							
Generation frequence	СУ		1 month				
Input satellite data			NWP (SEVIR	I, AVHRR)			
Dissemination							
Format			Means			Type	
HDF5		FTP, (CD-ROM, Email				
		=	Accu	racy	•		
10 W/m² monthly me	ean, foi	details	see compone	ents			
Verification method		compa	arison with in-	situ measurem	ents		
		Cove	rage, resoluti	on and timeli	ness		
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness	
Meteosat disk, Northern Europe (15 km) ²						Product discontinued on 01.03.2012 Products are only available until 28.02.2012	



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CM-78	Surfac	e Dow	nward Longv	vave Radiatio	n	SDL_SEVIRI		
Туре			Product	Product				
Applications and use	ers							
Characteristics and Methods			Monthly Mea	Monthly Mean, Monthly Mean Diurnal Cycle				
Comments								
Generation frequence	су		1 month					
Input satellite data			SEVIRI					
Dissemination								
Format			Means	i		Type		
HDF5		FTP, 0	CD-ROM, Ema	ail	offline			
			Accu	racy				
90 per cent of absolution measurements) for remountainous regions	nonthly	/ mean	s. Higher bias	values occur	n the A	Alpine and other		
Verification method		operat accura not ne	arison with in-situ measurements. Only a few reliable ional in-situ measurements are available in Africa. The target icy is based on the comparison at available stations and is cessarily valid everywhere in Africa. However, it is not ited that the quality is greatly reduced over Africa.					
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk	(15 km	n) ²				Product discontinued on 01.03.2012 Products are only available until 28.02.2012		

CM-79	Surfa	ce Do	wnward Lon	gwave Radia	ation	SDL_AVHRR_Europe		
Туре			Product					
Applications and u	sers							
Characteristics and Methods			Monthly Mea	Monthly Mean				
Comments								
Generation freque	ncy		1 month					
Input satellite data			AVHRR					
			Diss	semination				
Format			Means	3		Туре		
HDF5		FTP,	CD-ROM, Email Offli			е		
			Α	ccuracy				
measurements) for	r mont	hly me	ans. Higher b	nes below 10 W/m² (+ uncertainty of ground based ans. Higher bias values occur in the Alpine and other ouncertainties in area to point comparison.				
Verification method	d	comp	arison with in	n-situ measur	ement	s		
		Со	verage, resc	lution and ti	imelin	ess		
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		



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CM-80	Surfac	e Dow	nward Longv	vave Radiatio	n	SDL_merged		
Туре			Product					
Applications and use	ers							
Characteristics and Methods			Merged prod	Merged product Monthly Mean				
Comments								
Generation frequency			1 month					
Input satellite data			SEVIRI, AVH	IRR				
			Dissem	ination				
Format			Means			Type		
HDF5	FTP,			ail	offline			
			Accu	racy				
10 W/m² monthly me	ean, foi	details	s see compone	ents				
Verification method		Comp CM-78	arison with in-situ measurements of components CM-79 and 3.					
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk, Northern Europe	(15 kn	n) ²				Product discontinued on 01.03.2012 Products are only available until 28.02.2012		

CM-85	Surfac	e Net	Longwave Ra	diation		•	SNL_SEVIRI	
Туре			Product					
Applications and us	ers							
Characteristics and Methods			Monthly Mean, Monthly Mean Diurnal Cycle					
Comments								
Generation frequency			1 month					
Input satellite data			SEVIRI					
Dissemination								
Format			Means			Type		
HDF5		FTP, 0	CD-ROM, Ema	ail	offline			
			Accuracy					
15 W/m², see comp	onents	for deta	ails					
Verification method		calcula	ated based on	ated based on accuracy of SOL and SDL				
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk (15 km) ²						Product dis on 01.03.20 Products al available ul 28.02.2012	12 re only	



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CM-86	Surfac	e Net	Longwave	Radiation		SNL_AVHRR_Europe		
Type			Product					
Applications and users								
Characteristics and	d Metho	ods	Monthly Mean					
Comments								
Generation freque	ncy		1 month					
Input satellite data			AVHRR					
Dissemination								
Format			Means			Туре		
HDF5		FTP,	CD-ROM, En	nail	offline			
			A	ccuracy				
15 W/m², see com	ponent	s for d	letails					
Verification metho	d	calcul	ated based o	ated based on accuracy of SOL and SDL				
	.	Co	verage, resc	lution and t	imelin	ess		
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	Surfac	e Net	Longwave Ra	diation		SNL_merged		
Туре			Product					
Applications and use	ers							
Characteristics and Methods			Merged product, Monthly Mean					
Comments								
Generation frequency			1 month					
Input satellite data			SEVIRI, AVH	IRR				
Dissemination								
Format			Means		Type			
HDF5		FTP, (CD-ROM, Email					
			Accu	racy				
15 W/m², see compo	onents	for deta	ails					
Verification method		calcul	ated based on	ated based on accuracy of SOL and SDL				
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness		
Meteosat disk, Northern Europe	′ 1(15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012		



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CM-92	Surfac	e Radi	iation Budget		-	SRB_SEVIRI	
Туре			Product				
Applications and users							
Characteristics and Methods			Monthly Mea	n, Monthly Me	an Diu	rnal Cycle	
Comments							
Generation frequency			1 month				
Input satellite data			SEVIRI				
Dissemination							
Format			Means	•	Type		
HDF5		FTP, (CD-ROM, Ema	ail	offline		
			Accuracy				
20 W/m², see compo	onents	for deta	ails				
Verification method		Calcul	lated based or	ated based on accuracy of components			
		Cove	rage, resoluti	on and timeli	ness		
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	Timeliness	
Meteosat disk	isk (15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012	

CM-93	Surfa	ce Ra	diation Budg	jet		SRB_AVHRR_Europe		
Туре			Product					
Applications and users								
Characteristics and	d Meth	ods	Monthly Mea	an				
Comments								
Generation freque	ncy		1 month					
Input satellite data			AVHRR					
Dissemination								
Format			Means	3		Туре		
HDF5		FTP,	CD-ROM, Er	DM, Email offline				
			Α	ccuracy				
20 W/m², see com	ponen	ts for c	details					
Verification method	d	Calcu	lated based on accuracy of components.					
		Co	verage, reso	olution and t	imelin	ess		
Spatial coverage	Spatial resolution		lution	Vertical resolution		Timeliness		
Europe	(15 km) ²					Product discontinued on 01.03.2012 Products are only available until 28.02.2012		



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CM-94	Surfac	e Rad	iation Budget			SRB_merged		
Туре			Product					
Applications and users								
Characteristics and Methods			Merged prod	uct, Monthly M	lean			
Comments								
Generation frequency			1 month					
Input satellite data			SEVIRI, AVH	IRR				
Dissemination								
Format	Format			i		Туре		
HDF5		FTP, 0	CD-ROM, Email offl					
			Accu	racy				
20W/m², see compo	nents f	or deta	ils					
Verification method		Calcu	lated based or	ated based on accuracy of components.				
		Cove	rage, resoluti	on and timeli	ness			
Spatial coverage	Spatia	ıl resolu	ution	Vertical resol	ution	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	Irradia	nce at Surfac	e		SID_SEVIRI		
Туре			Product					
Applications and users			* NMHSs * Governme * Privat Sec * Public Sec					
Characteristics an	d Meth	nods	Daily Mean Monthly Me	an				
Comments								
Generation frequency			1 day, 1 month					
Input satellite dat	a		SEVIRI					
	Dissemination							
Format			Means			Type		
HDF5		FTP, (CD-ROM, Em	ail offline				
			Accur	асу				
measurements) fo	r mon	thly m	ieans. Highei	r bias values	occur	inty of ground based in the Alpine and to point comparison.		
Verification metho	od	comp	arison with in -situ measurements					
	Coverage, resolution and timeliness							
Spatial coverage	Spatia	al reso	lution	Vertical resolution		Timeliness		
Meteosat disk	(15 k	m)²				2 month		



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CM-112	Incom		lar Radiative	Flux at the top	o of	1	ΓIS_merged	
Туре	•		Product	Product				
Applications and users								
Characteristics and Methods			Daily mean, N	Monthly Mean,	Month	y Mean Diurr	nal Cycle	
Comments			The accuracy	is given as the	e (maxi	mum absolut	e) bias.	
Generation frequency			1 day 1 mont	h				
Input satellite data			DIARAD/VIRGO					
			Dissemi	nation				
Format			Means			Type		
HDF5		FTP, 0	CD-ROM, Ema	il	offline			
		Ë	Accur	асу				
1 W/m² (This accura	cy is in	variant	in time and wil	I not be monito	ored in	OR)		
Verification method		Interco	omparison of absolute radiometers					
		Cover	age, resolutio	n and timelin	ess			
Spatial coverage	Spatia	l resolu	ition	Vertical resolu	ution	Timeliness		
Meteosat disk, Northern Europe	(45 km	n) ²				4 month		

CM-114	Reflec Atmos		ar Radiative F	Flux at the Top	o of	TRS	
Туре			Product				
Applications and users							
Characteristics and I	Methods	3	Daily Mean, N	Monthly Mean,	Monthl	y 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 montl	h			
Input satellite data			GERB, SEVIRI				
	Dissemination						
Format			Means			Type	
HDF5		FTP, 0	CD-ROM, Email		offline		
			Accura	асу	<u>-</u>		
0.88 – 1.12 in ratio							
Verification method For da			parison to CERES, evaluated is the ratio of GERB/CERES. ata of Meteosat 8 comparison to GERB-like is used in the fashion. Compared are temporal slots between 11 and 12 only.				
		Covera	age, resolutio	n and timeline	ess		
Spatial coverage	Spatia	l resolu	tion	Vertical resolu	ution	Timeliness	
Meteosat disk	(45 km	1) 2				4 month	



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CM-116	Emitte Atmos		mal Radiative	Flux at the To	op of	TET		
Туре	Туре			Product				
Applications and users								
Characteristics and I	Methods	3	Daily Mean, N	Monthly Mean,	Monthl	y 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	า				
Input satellite data			GERB, SEVIRI					
			Dissemin	ation				
Format			Means			Type		
HDF5		FTP, 0	CD-ROM, Email offli			offline		
			Accura	асу				
0.94 – 1.06 in ratio								
Verification method For da			parison to CERES, evaluated is the ratio of GERB/CERES. ata of Meteosat 8 comparison to GERB-like is used in the fashion. Compared are temporal slots between 11 and 12 only.					
		Covera	age, resolution and timeliness					
Spatial coverage	Spatia	l resolu	tion	Vertical resolu	ution	Timeliness		
Meteosat disk	(45 km	n) ²			•	4 month		

CM-122	Vertic	ally In	tegrated Wa	ter Vapour	•	HTW_ATOVS_global		
Туре			Product	Product				
Applications and users								
Characteristics and	d Meth	ods	Daily Mean,	Monthly Mea	ın			
Comments								
Generation freque	ncy		1 month					
Input satellite data	Input satellite data			ATOVS				
Dissemination								
Format			Means			Type		
HDF5		FTP,	CD-ROM, Email offline)		
			A	ccuracy				
1 mm bias (absolu	te valu	e), 4.5	mm rms, Hig	her deviation	ns may	occur over desert regions.		
Verification method	d	GUAN	N radiosonde					
		Co	verage, reso	lution and ti	meline	ess		
Spatial coverage	Spatia	al reso	lution	Vertical resolution		Timeliness		
Global	(90 kr	m)²				2 month		



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CM-127	Vert	icall	y Integrate	ed Water V	apour	HTW_SSMI_global_DS				
Туре			Dataset	Dataset						
Applications a	and us	ers	* Climate * NMHSs	Research						
Characteristic Methods	s and		Daily Mea Monthly N							
Comments The time series covers 1987-2005. Accuracy numbers are given global mean values. Regional larger deviations may occur.										
Generation fr	equen	uency N/A								
Input satellite	nput satellite data SSM/I									
				Disse	emination					
Format			Mean	S	Туре					
Netcdf		FTP	1		offline					
				Ac	curacy					
0.05 % dec	adal s	stabi	lity, 1 kg	m ⁻² bias	, 2 kg m ⁻²	rms				
Verification method				measurem omparison						
			Cove	age, resol	ution and	timeliness				
Spatial coverage	Spa	tial re	esolution	Vertical re	solution	Timeliness				
global ice free ocean	0.5°					N/A				

CM-131	Layer	ed wa	ter vapor an	d temperatu	re	HLW_	ATOVS	_global
Туре			Product					
Applications and	users							
Characteristics and Methods			Daily Mean, 5 layers	Monthly Mea	an			
Comments								
Generation frequency	uency		1 month					
Input satellite da	ıta		ATOVS					
Dissemination								
Format			Means			Type		
HDF5		FTP,	CD-ROM, En	D-ROM, Email offline				
		2	Ad	ccuracy	2			
1	empera	ture [K		Humidity [mm]				
layer	bia	-	rms	laye	r	bias	rm	
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
5		0.50	2.2			0.75 0.6		2.0
Higher deviation	s may o		I		ļ.	0.0		2.70
Verification method GUAN radiosonde								
		Co	verage, reso	lution and ti	imeline	ess		
Spatial coverage	Spati	al reso	lution	Vertical resolution Timeliness				
Global	(90 k	m)²				2 month		



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CM-137 Specific Humidity and Temperature at pressure levels HSH_ATOVS_g										
Туре	ype Produ									
Applications and	users									
Characteristics and Methods			Daily Mean, 6 levels	Mont	thly Mea	ın				
Comments										
Generation frequ	iency		1 month							
Input satellite dat	ta		ATOVS							
Dissemination										
Format			Means	S			Туре	Туре		
HDF5	FTP,	CD-ROM, Email offline								
			Ac	cura	су	ı				
Te	emperati	ıre [K]	Humidi			lumidity [g/kg]	ity [g/kg]		
level	bias		rms		level		bias	rms		
1		1.25	3.	0	1		0.015	0.05		
2		1.25	2.	-	2		0.02	0.25		
3		0.5	2.	-	3		0.1	1.0		
4		0.3	2.	-	4		0.2	1.5		
5		0.3	2.	•	5		0.5	2.0		
6		0.4	2.	5	6		0.3	2.0		
Higher deviations	s may occ	cur ov	er desert regi	ons.						
Verification method GUAN radiosonde										
	•	Cov	erage, reso	lution	n and ti	meline	ess			
Spatial coverage	Spatia	l resol	ution	Vertical resolution T			Timeliness			
Global	(90 km	1)²					2 month			

CM-141	Near S	Surface	Specific Hu	midity		NSH_HOAPS		
Туре			Dataset					
Applications and u	ısers		* Climate R * NMHSs	esearch				
Characteristics an	ıd Met	hods	Composite Monthly Me	an				
Comments			Accuracy nu	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.				
Generation freque	ency		N/A					
Input satellite dat	a		SSM/I					
			Dissem	ination				
Format			Means			Type		
Netcdf		FTP			9			
			Accu	racy				
Bias:-0.4 g/kg (3	%), RI	MS: 0.	1 g/kg (1%)); decadal st	ability	: -0.1 %		
Verification metho	od	Comp	arison to sh	ip and buoy	based	measurements		
	C	overa	ge, resoluti	ion and tim	elines	SS		
Spatial coverage	Spatial resolution			Vertical resolution		Timeliness		
global ice free ocean	0.5°					N/A		



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CM-142	Near	Surfa	ce Wind Sp	eed		SWS_HOAPS		
Туре	-		Dataset					
Applications and users			* Climate R * NMHSs	esearch				
Characteristics ar	nd Met	hods	Composite Monthly Me	an				
Comments			Accuracy no	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.				
Generation freque	ency		N/A					
Input satellite dat	ta		SSM/I					
			Dissem	ination				
Format			Means	;	Туре			
Netcdf		FTP			offline	е		
			Accı	ıracy				
Bias: 0.24 m/s, r	ms: 0.	15 m/	s, Decadal s	stability: 0.0	9 m/s			
Verification meth	od	Comp	arison to sh	ip and buoy	based	l measurements		
	С	overa	ge, resolut	ion and tim	eline	SS		
Spatial coverage	Spati	al reso	olution	Vertical resolution		Timeliness		
global ice free ocean	0.5°					N/A		

CM-143	Later	it Hea	t Fluxes			LHF_HOAPS		
Туре	-		Dataset					
Applications and u	users		* Climate R * NMHSs	esearch				
Characteristics an	nd Met	hods	Composite Monthly Me	an				
Comments			Accuracy nu	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.				
Generation freque	ency		N/A					
Input satellite dat	a		SSM/I					
			Dissem	ination				
Format			Means	•	Туре			
Netcdf		FTP			offline			
			Accu	racy				
Bias: 1 W/m², rm	ıs: 3.7	W/m ²	² , Decadal st	ability: 2.7	W/m²			
Verification method	od	Comp	arison to sh	ip and buoy	based	measurements		
	C	overa	ge, resoluti	on and tim	elines	ss		
Spatial coverage	Spatial resolution			Vertical resolution		Timeliness		
global ice free ocean	0.5°					N/A		



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CM-144	Preci	pitati	on	<u> </u>		PRE_	HOAPS	
Туре	-		Dataset					
Applications and u	ısers		* Climate R * NMHSs	esearch				
Characteristics an	d Met	hods	Composite Monthly Me	an				
Comments	Accuracy nu	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.						
Generation freque	ency		N/A					
Input satellite dat	:a		SSM/I					
			Dissem	ination				
Format			Means	;	Type			
Netcdf		FTP		offline				
			Accu	racy				
Bias: -0.12 mm/d	l, rms:	0.14	mm/d, Deca	dal stability	: -0.01	l mm/d		
Verification method	od	Comp	arison to sh	ip and buoy	based	measurements	;	
	C	overa	ge, resoluti	on and tim	elines	s		
Spatial coverage	Spatia	al resc	olution	Vertical resolution		Timeliness		
global ice free ocean	0.5°					N/A		

CM-145	Evap	oratio	n		,	EVA_HOAPS	
Туре	=		Dataset				
Applications and u	ısers		* Climate R * NMHSs	esearch			
Characteristics an	ıd Met	hods	Composite Monthly Me	an			
Comments			Accuracy nu	Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.			
Generation freque	ency		N/A				
Input satellite dat	a		SSM/I				
			Dissem	ination			
Format			Means		Type		
Netcdf		FTP			offline		
			Accu	racy			
Bias: 0.04 mm/d,	rms:	0.13 r	mm/d, Decad	dal stability:	-0.01	mm/d	
Verification method	od	Comp	arison to sh	ip and buoy	based	measurements	
	C	overa	ge, resoluti	ion and tim	elines	SS	
Spatial coverage	Spati	al reso	olution	Vertical resolution		Timeliness	
global ice free ocean	0.5°					N/A	

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CM-146	Evapo	oratio	n-Precipita	ition		EMP_HOAPS		
Туре	-		Dataset					
Applications and u	users		* Climate R * NMHSs	lesearch				
Characteristics an	nd Met	hods	Composite Monthly Me	an				
Comments		Target time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur.						
Generation freque	ency		N/A					
Input satellite dat	a		SSM/I					
Dissemination								
Format			Means			Type		
Netcdf		FTP	offlin			е		
			Accı	ıracy				
Bias:0.04 mm/d	,rms:	0.2 m	m/d, Decad	al stability: ().1 mr	m/d		
Verification metho	bc		parison to global river runoff data. Comparison to rated water vapor.					
	C	overa	ge, resolut	ion and tim	eline	ss		
Spatial coverage	Spatia	al reso	olution	Vertical resolution		Timeliness		
global ice free ocean	0.5°					N/A		

CM-54	SIS_MVIRI_disk_DS							
Туре	-		Dataset					
Applications and users			* NMHSs	* Government agencies * Privat Sector				
Characteristics Methods	and		Instantaneous Monthly Mean, Daily Mean					
Comments			time series from 1983-2005					
Generation freq	uency	/	N/A					
Input satellite d	lata		MVIRI					
			Dissemi	natio	n			
Format			Means			Туре		
netcdf		FTP	Offline			e		
			Accui	racy				
			. diff. (MAD): 8 Nean abs. diff. (M		15 W,	/m²		
Verification met	hod	comp	parison with in-s	itu me	easure	ements		
		Cove	erage, resolutio	on an	d tim	eliness		
Spatial coverage	Spati	ial res	solution	Verti resol		Timeliness		
Meteosat disk		gular latitude longitude id 0.03 x 0.03 degree				N/A		



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CM-106	Dire	ct Irr	adiance at Surf	ace		SID_MVIRI_disk_DS		
Туре	ype Dataset							
Applications and users			* NMHSs	* Government agencies * Privat Sector				
Characteristics Methods	and		Instantaneous Monthly Mean, D	Daily	Means			
Comments			time series from	198	3-2005			
Generation freq	uency	1	N/A					
Input satellite d		MVIRI						
	Dissemination							
Format			Means			Type		
netcdf		FTP	Offline					
			Accura	асу	-			
			. diff. (MAD):11 \ ean abs. diff. (MA			1 ²		
Verification met	hod	com	parison with in-si	tu me	easureme	nts		
		Cove	erage, resolutio	n an	d timelir	ness		
Spatial coverage	Spat	Spatial resolution			ical Iution	Timeliness		
Meteosat disk			titude longitude x 0.03 degree			N/A		

CM-111	Cloud	d Albe	edo			CAL_MVIRI_	_DS	
Type	-		Dataset					
Applications and users			* Climate Resea * NMHSs * Government a * Privat Sector * Public Sector					
Characteristics a Methods	nd		Instantaneous, Monthly Mean, I	Daily mean				
Comments			time series from	1983-2005	j			
Generation frequ	iency		N/A					
Input satellite da	ata		MVIRI					
			Disseminat	ion				
Format			Means		Туре			
netcdf		FTP		Offline				
		•	Accurac	У				
			liff. (MAD):0.05 nn abs. diff. (MAD					
Verification meth	nod	RTM	studies using GE	RB TOA flux				
Coverage, resolution and timeliness								
Spatial coverage	Spati	al res	olution	Time	liness			
Meteosat disk	_		itude longitude 0.03 degree		N/A			



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CM-05 Fractional Cloud Cover CFC_AVHRR_global_D									
Туре			Data set						
Applications and users			* Climate * NMHSs * Governr * Privat S * Public S	nent agend	cies				
Characteristics Methods	and		Daily Mea Monthly M						
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 free	quency	N/A							
Input satellite	data		AVHRR_GAC						
			Disse	mination					
Format			Means			Type			
netcdf		FTP	offline			ne			
			Acc	curacy					
Accuracy: 3.6 ^o Bias corrected			YNOP)						
Verification me	thod	narily comparisons with SYNOP but complemented consistency checks against MODIS and idsat/CALIPSO datasets							
Coverage, resolution and timeliness									
Spatial coverage	Spatial	resol	ution	Vertical resolution		Timeliness			
Global	$(0.25)^2$!		n/a		N/A			

CM-11	Joint (Cloud	l Histogra	ams		JCH_AVHRR_global_DS		
Туре	-	Dataset						
Applications a	nd user	S	* 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 seri	es from 19	982	2-2009.			
Generation fre		N/A						
Input satellite	data		CTO (CM-17), COT (CM-34), CPH (CM-38)					
			Disser	mination				
Format			Means			Type		
Netcdf		FTP	offline			fline		
			Acc	uracy				
n/a								
Verification me	ethod	n/a						
	Coverage, resolution and timeliness							
Spatial coverage	Spatial reso		lution	Vertical resolution		Timeliness		
Global	$(1.0)^2$			n/a		N/A		



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CM-17	Cloud Top	,			CTO_AVHRR_global_DS	
Type		Dataset				
Applications and	d users	* NMHSs * Govern * Privat S	Climate Research MMHSs Government agencies Privat Sector Public Sector			
Characteristics Methods	and	Cloud Top Cloud Top	an and Monthly Temperature (Height (CTH) Pressure (CTP	(CTT		
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 o	data	AVHRR_GAC				
	-	Dis	ssemination			
Form	at		Means		Type	
netcdf		FTP			offline	
		-	Accuracy			
The accuracy is Accuracy: -40 t Bias corrected I	o -50 hPa		S data as refere	ence		
Verification met	thod	Compa	rison with MOD	IS,	PATMOS-X and ISCCP.	
	Cove	rage, res	olution and ti	mel	iness	
Spatial coverage	Spatial res	olution	Vertical resolution	Tim	neliness	
Global	$(0.25)^2$		n/a	N/A		

CM-34 Cloud Optical Thickness COT_AVHRR_global								
Туре	-	Dataset						
Applications a	and use	* NMHSs	* Climate Research * NMHSs * Government agencies					
Characteristic Methods	s and	Daily Mea Monthly I						
Comments			Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.					
Generation fr	equenc	N/A						
Input satellite	e data	AVHRR_C	AVHRR_GAC					
Dissemination								
Format		Mean	S	Туре				
netcdf		FTP	О	fflin	fline			
			Accuracy					
The accuracy Accuracy: -5 bias corrected decadal stabil	% to -: d RMS:	30 %	S data as re	fere	ence			
 Comparison with MODIS (2000-2009) Comparison with PATMOS-x Comparison with ISCCP Comparison with Cloudsat/Calipso (2007-2009) 								
	•	Coverage, r	esolution a	nd	timeliness			
Spatial coverage	Spati	ial resolution	Vertical					
Global	(0.25	5°)²	n/a		N/A			



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CM-38 Cloud Phase CPH_AVHRR_global_								
Туре			Dataset					
Applications and users			* Climate Research * NMHSs * Government agencies					
Characteristics Methods	and		Daily Mea Monthly N					
Comments			Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.					
Generation free	quenc	СУ	N/A					
Input satellite data			AVHRR_G	AVHRR_GAC				
Dissemination								
Format			Means			Туре		
netcdf		FTP			offline			
				Accurac	Э			
The accuracy is Bias: 3-20 % Bias corrected Decadal stabilit	RMS:	12-2		S data as ı	refere	ence		
 Comparison with MODIS (200 Comparison with PATMOS-x Comparison with ISCCP Comparison with Cloudsat/Ca 								
		Co	verage, r	esolution	and	timeliness		
Spatial coverage	Spati	Spatial resolution		Vertical resolution	1	Timeliness		
Global	(0.25	5°)2		n/a		N/A		

CM-43	Liqui	d Wa	ater Path			LWP_AVHRR_global_DS	
Туре			Dataset				
Applications and users			* NMHSs	Research	cies		
Characteristics Methods	and		Daily Mea Monthly N				
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_G	SAC			
			Dis	seminatio	n		
Format	Format			S		Type	
netcdf	I	FTP		offline			
	-		ļ	Accuracy			
The accuracy is Bias: 15 % Bias corrected I Decadal stabilit	RMS:		_	S data as	refere	ence	
Verification method	mparison with satellite MWR retrieved LWP over n (e.g. LWP_HOAPS). mparison with MODIS (2000-2009). mparison with PATMOS-x mparison with ISCCP						
	C	ovei	age, reso	olution ar	d tin	neliness	
Spatial coverage	Spatial resoluti		vertical resolution			Timeliness	
Global	(0.25	°) ²		n/a		N/A	



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CM-47	Ice W	ater Pa	th			IWP_AVHRR_Global_DS	
Type	3		dataset				
Applications an	id use	rs	Climate R	lesearch			
Characteristics	and M	1ethods		in, monthly period cov		an will be 1982-2009	
Comments			defined for	Time series from 1982-2009. Bias and rms are defined for the globe; regionally larger differences may occur.			
Generation free	quency	У	N/A				
Input satellite	data		AVHRR G	AC			
			Disse	mination			
Format			Means			Туре	
netcdf		FTP			offline		
			Ac	curacy			
The accuracy is Bias: 0 % to -8 Bias corrected Decadal stabilit	30 % rms: 3	35-45 %		ta as refer	ence		
Verification method • compa			arison with CloudSat arison with PATMOS-X arison with MODIS arison with ISCCP				
	Covera	ge, resol	ution and	time	eliness		
Spatial coverage	Spatia	al resolution		Vertical resolution	1	Timeliness	
Global	(0.25)2		n/a		n/a	

CM-52	CM-52 Surface incoming shortwave radiation									
Туре	Туре									
Applications and users			* NMHS	nment age Sector		s				
Characteristics an	d Meth	ods	Daily Me Monthly							
Comments		time ser	ies from 1	989-	2009					
Generation freque		N/A								
Input satellite dat	a		AVHRR_GAC							
			Diss	eminatio	n					
Format			Means			Type				
netcdf		FTP			offlir	ne				
			А	ccuracy						
Monthly mean accura										
Verification metho	com	parison with in-situ measurements								
Coverage, resolution and timeliness										
Spatial coverage	Spatia	al res	olution	Vertical resolution	1	Timeliness				
Global	(0.25	°) ²		n/a		N/A				



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CM-60 Surface Albedo SAL AVHRR global									
Туре	Surr	ace A	Dataset	SAL_AVIIKK_GIODAI_DS					
Applications an	nd use	ers		Research					
			* Governi	ment agen	cies				
Characteristics Methods	and		Pentad Me Monthly M						
Comments			time serie	es from 198	32-20	009			
Generation free	quen	СУ	N/A						
Input satellite	data		AVHRR_GAC						
Dissemination									
Format			Means	Means Type					
netcdf		FTP	offline						
				Accurac	у				
Mean relative r Mean rmse: 0. Decadal stabili 5.8 %	091				heet	(1989-2009, in relative units):			
Verification method	inuous vali paigns	idation at r	nast	measurement sites & field					
_		Cov	verage, re	esolution	and	timeliness			
Spatial coverage	Spat	atial resolution		Vertical resolution		Timeliness			
Global	(0.2	5°)²		n/a		N/A			

CM-67	Surfa Radia		et Short	:wave		SNS_AVHRR_global_DS
Туре	_		Dataset			
Applications and users			* Climate Research * NMHSs * Government agencies			
Characteristics an	d Meth	ods	Monthly	Mean		
Comments			time ser	ies from 1	989-	·2009
Generation freque		N/A				
Input satellite data			AVHRR_GAC			
			Diss	seminatio	n	
Format			Means Type			Туре
netcdf		FTP	offline			
			A	ccuracy		
monthly mean acc	curacy	20 \	W/m²			
Verification metho	od	calc	ulated ba	sed on ac	curac	cy of SAL and SIS
	Co	vera	ge, reso	olution an	d tir	meliness
Spatial coverage	Spatia	ial resolution		Vertical resolution	1	Timeliness
Global	(0.25	°) ²		n/a		N/A



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('M = / /L	rface (Longwave	:	SOL_AVHRR_global_DS		
Type		Dataset					
Applications and u	sers	* NMHSs	Research	cies			
Characteristics and Methods	i	Monthly M	Monthly Mean				
Comments		time serie	es from 198	39-20	09		
Generation freque	псу	N/A					
Input satellite data	ì	NWP (AVHRR_GAC)					
		Diss	emination	1			
Format		Means			Type		
netcdf	FTP	offline			е		
		A	ccuracy				
Monthly mean acc	uracy:	14 W/m²					
Verification metho	dcom	parison wit	th in-situ n	neasu	rements		
	Cover	age, reso	lution and	l tim	eliness		
Spatial coverage Sp	Spatial resolution		Vertical resolution		Timeliness		
Global (0.	25°)²			•	N/A		

	Surfa Radia	SDL_AVHRR_global_DS					
Туре	_		Dataset	t			
Applications and	* NMHS	* Climate Research * NMHSs * Government agencies					
Characteristics ar Methods	nd		Monthly	y Mean			
Comments			time se	ries from 1	989-2	009	
Generation frequ	ency		N/A				
Input satellite da	ta		AVHRR_GAC				
			Di	sseminatio	on		
Format			Means Type			Туре	
netcdf		FTP	offline				
				Accuracy			
Monthly mean ac	curacy	/: 8 V	V/m²				
Verification method comparison with in-situ measurem						urements	
Coverage, resolution and timeliness							
Spatial coverage	Spatia	Spatial resolu		Vertical resolution		Timeliness	
Global	(0.25	(0.25°)² n/a				N/A	



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CM-88 Sur Rad	SNL_AVHRR_global_DS					
Type		Dataset				
Applications and us	* NMHSs	Research ment agen	cies			
Characteristics and Methods		Monthly N	1ean			
Comments		time serie	es from 19	89-20	009	
Generation frequen	су	N/A				
Input satellite data		AVHRR_GAC				
		Dis	seminatio	n		
Format		Means Type			Туре	
netcdf	FTP	offline				
		Δ	ccuracy			
Monthly mean accu	racy:	22 W/m²				
Verification method	calcı	ulated based on accuracy of SOL and SDL				
	Cove	rage, reso	lution an	d tin	neliness	
Spatial Spa	Spatial resolution		Vertical resolution	l	Timeliness	
Global (0.2	5°)²		n/a		N/A	

CM-95 Surface Radiation Budget SRB_AVHRR_global									
Туре	-		Dataset	Dataset					
Applications and users			* NMHS	* Climate Research * NMHSs * Government agencies					
Characteristics an	d Meth	ods	Daily Me	an TBC M	onth	ly Mean			
Comments			time ser	ies from 1	989-	2009			
Generation freque	ncy		N/A						
Input satellite dat	a		AVHRR_GAC						
			Diss	seminatio	n				
Format			Means Type			Туре			
netcdf		FTP	offline						
			Α	ccuracy					
Monthly mean acc	uracy:	42 V	V/m²						
Verification metho	calcı	ulated based on accuracy of SNS and SNL							
	vera	ge, resolution and timeliness							
Spatial coverage	Spatia	Spatial resolutio		Vertical resolution	า	Timeliness			
Global	(0.25	°) ²		n/a		N/A			



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N/A

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CM-101 Cloud Ra	diative Effect LW	CFL_	_AVHRR_	_global_DS				
Туре	Dataset	Dataset						
Applications and users	* Climate Researc * NMHSs * Government age * Private Sector * Public Sector							
Characteristics and Methods	Monthly Mean							
Comments	time series from 1	.989-2009)					
Generation frequency	N/A							
Input satellite data	AVHRR_GAC							
Dissemination								
Format	Means Type							

Date:

netcdf CF		FTP		offlir	ne			
Accuracy								
Monthly mean accuracy 15 W/m ²								
Verification metho	od	calculated fro	om radiati	on pr	oducts			
	Cove	rage, resolu	tion and	time	eliness			
Spatial coverage	al resolution	Vertical resolution	ר	Timeliness				

n/a

 $(0.25^{\circ})^{2}$

Global



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CM-69	SNS	_MVIRI_disk_DS					
Туре	Dataset	Dataset					
Applications and users		* NMHSs	* Government agencies * Private Sector				
Characteristics and	d Meth	ods	Monthly Mean				
Comments			time series from	198	33-2005		
Generation freque	ncy		N/A				
Input satellite data			MVIRI based solar radiation (CM-54) and the AVHRR GAC surface albedo (CM-60)				
			Dissemination	1			
Format			Means		Type		
Netcdf CF		FTP,	CD-ROM	c	offline		
			Accuracy				
The accuracys is g exception of brigh Here the accuracy occur over fresh s	t deser is belo	t and w 20	d snow/ice surface) W/m**2, slightl	es. y hi	gher unce	•	
Verification metho	d	calcı	ulated based on a	ccui	racy of S	AL and SIS	
	Cove	rage	, resolution and	tim	neliness		
Spatial coverage	Spatia	ıl res	olution		tical olution	Timeliness	
Meteosat disk		Regular latitude longitude grid 0.03 x 0.03 degree			ı	N/A	

CM-150	Microwa	ve Rad	iance FC	DR	FCDF	R_SSMI	_global_[วร
Type			Dataset					
Application	s and user	rs	* Valida * Basis (SAF)	* NMS and reanalyses for assimilation * Validation of (climate) models * Basis for TCDR products (from CM SAF, OSI SAF) * Soil moisture community				
Characteris	tics and M	ethods		ess Tempera channels of		wath-bas	sed,	
Comments			Accuracy values.	The time series covers 1987-2008. Accuracy numbers are given for global mean values. Regional larger deviations may occur. Ouality is applicable for ocean observations.				
Traceability	of Requir	ements	See section PRD section 10.7 for details					
Generation	frequency	1	N/A					
Input satel	lite data		SSM/I					
			Dissemination					
Format		Means			Type	Гуре		
Netcdf CF		FTP			offline	offline		
		-	Accuracy					
bias: < 0.2 RMS: < 1 k decadal sta	<; (< 2 K f	or chan	nels 37h	and 85h) all channels				
Verification	method		satellite comparison (rms based on global thly means)					
	Co	verage	, resolut	tion and tir	nelines	s		
Spatial coverage	Spatial r	esolutio	vertical resolution		Time	liness		
global	Sensor r	esolutio	n	n/a	N/A			



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CM-113	Refle	ative Flux	at	TRS_merged_DS				
Туре	-		Dataset					
Applications and	users	•	* Climate I * NMHSs	Research				
Characteristics and Methods			Monthly Me	Daily mean Monthly Mean Monthly Mean Diurnal Cycle				
Comments			time series	from 01.02	2.2004	I- 31.01.2011		
Generation frequ	iency		N/A					
Input satellite da	ata		GERB, SEVIRI, CERES					
			Dissem	ination				
Format			Means			Type		
netcdf CF		FTP	offline			е		
			Accu	racy				
Monthlymean (r daily mean (rms								
Verification meth	nod	GERE	3 CERES intercomparison					
Coverage, resolution and timeliness						ss		
Spatial coverage	Spati	al res	olution	Vertical resolution		Timeliness		
Meteosat Disk + Arctic	(45 k	m)²				N/A		

CM-115				ermal Radiative Flux at Atmosphere TET_merge				
Туре			Dataset					
Applications and	users		* Climate F * NMHSs	Research				
Characteristics and Methods			Monthly Me	Daily mean Monthly Mean Monthly Mean Diurnal Cycle				
Comments			time series	from 01.02	2.2004	1-31.01.2011		
Generation frequency			N/A					
Input satellite da	ata		GERB, SEVIRI					
			Dissem	ination				
Format			Means			Type		
netcdf CF		FTP	offline					
			Accu	racy				
monthly mean (r daily mean (rms	,	•						
Verification meth	nod	GERE	3 CERES intercomparison					
Coverage, resolution and timeline						SS		
Spatial Spatial residues			olution Vertical resolution			Timeliness		
Meteosat disk + Arctic	1/45 km 1-					N/A		



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CM-123 Vertically Integrated Water HTW_ATOVS_glob									
Type			Dataset						
Applications ar	nd us	ers	* Climate * NMHSs	Rese	earch				
Characteristics Methods	and		Daily Mea Monthly N						
Comments					s from 01.01.1999-31.12.2011 umbers are given for global mean values.				
Generation fre	quen	су	N/A						
Input satellite	data		ATOVS	ATOVS					
			Di	ssem	inati	on			
Format			Mean	Means Type			Туре		
Netcdf CF		FTP,	CD-ROM	D-ROM Offline					
				Accı	ıracy				
vs. GUAN mea Bias -0.16 kg/ RMS: 3.25 kg/	m²	nents	5		Vs. AIRS measurements: Bias:1.53 k/m² RMS: 2.38 kg/m²				
Verification ground based measuremethod ground based measuremethod						ents			
_		Cov	erage, res	solut	ion a	nd t	imeliness		
Spatial coverage	Spat	ial re	resolution Vertireso			1	Timeliness		
Global	(90	km)²					N/A		

CM-132 Layered wate temperature						r vapour and HLW_ATOVS_global_ DS						
Туре					Dataset							
Applications and users					* Climate Research, NMHSs							
Characteristics and Methods				ods	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 I				M	Means				Type			
Netcdf CF FTP, CD-I				P, CD-R	MO	offline						
					Ac	ccui	racy	•				
	Temperature [K]							Hun	ımidity [kg m ⁻²]			
	layer	bias		rmse				layer	bias	rmse		
	1		11	1.34	_			1	0.0014	0.035	ļ	
	2	-0.	_	1.24	_		-	2	0.0029	0.39		
	3	-0.		1.34			-	3	0.22	1.15		
	5	-0. -0.		1.44 1.8	_		-	<u>4</u> 5	-0.64	1.25 1.72		
Verification method				1.0	<u> </u>		ground based measurements, intersatellite comparison					
Coverage, resolution and timeliness												
Spatial coverage Spatial resoluti					Vertical resolution			Timeliness				
Global	(90 l	2					N/A					



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CM-138	mpe	ratu	re	HSH_A	TOVS_g	lobal_DS					
Туре	Dataset										
Applications and	Applications and users					* Climate Research, NMHSs					
Characteristics a	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 freq	uency		N/A								
Input satellite data				ATOVS							
	emination										
Format				Means			Type				
Netcdf CF FTP, C			-ROM offline								
	Ac						ccuracy				
Temp	perature [K]			Humidity [g/kg]							
1 2 3 4 5 6	-0.25 1. -0.13 1. -0.076 1.	80 32 45 46 70			1 2 3 4 5 6		bias 0.0032 -0.013 0.05 0.15 0.11 -0.046	rms 0.021 0.076 0.45 0.92 1.01 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										
Туре	I	Dataset								
Applications and users	;	* Climate Research								
Characteristics and Methods		3-hourly Monthly Mean								
Comments	t (-	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	ı	N/A								
Input satellite data	ı	MVIRI, SEVIRI								
Dissemination										
Format		Means		Туре						
Netcdf CF	FTP									
Accuracy										
bias: -2.9%, rmsd: 15.5% decadal stability: 0.5±0.45%										
Verification method	with t	the ARSA radiosondes data set								
Coverage, resolution and timeliness										
Spatial coverage		Spatial resolution	Vertica resoluti		Timeliness					
Meteosat disk covering N/S and ±45° W/E	±45°	(0.625°)²			N/A					



Service Specifications

CM-06	Fraction	onal Clo	ud Cover			CFC_SEVIRI	_disk_	DS			
Туре	-		Data set	Data set							
Applications and	d users					Ss, Governmen lic Sector	t				
Characteristics		ourly, Da Irnal Cycl	•	Monthly Mean,	Month	ly					
Comments			Time seri	es from 0	1.01	.2004-31.12.20	11				
Generation freq	luency		N/A								
Input satellite o	lata		SEVIRI								
	Dissemination										
Format			Means			Туре					
netcdf CF (Leve hdf5 (level 2)	el 3)	FTP			offline						
		-	Accur	Accuracy							
Bias 2.7 %,(SY RMS: 14.0 % (S				Bias 1.7 % (MODIS) RMS: 8.8 % (MODIS)							
Verification met	thod	consiste	ncy check	sons with SYNOP and complemented with ncy checks against MODIS and t/CALIPSO datasets							
	Co	verage,	resolutio	on and ti	melii	ness					
Spatial coverage	Spatia	l resoluti	on	Vertical resolution		Timeliness					
Meteosat disk	(0.05)	esolutior ² level 3 ² diurnal	i. level 2 cycle	n/a		N/A					

CM-12	Joint Cl	oud	Histogra	ms		JCH_SEVIRI_disk_DS	
Type	-		Dataset				
Applications ar	nd users		* Climate	Research			
Characteristics and Methods			cloud opt This prod CPH (CM-	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 seri	es from 0	1.01.	2004-31.12.2011	
Generation fre	quency		N/A				
Input satellite	data		CTO (CM-18), CPH (CM-39), COT (CM-35)				
			Dissen	nination			
Format	t		Means			Туре	
netcdf CF		FTP			offline		
			Accı	uracy			
N/a		N/a			N/a		
Verification me	ethod						
	Cov	erag	e, resolut	ion and t	imel	iness	
Spatial coverage	Spatial	resol	ution	Vertical resolution		Timeliness	
Meteosat disk <72° satellite zenith angle	(0.25°)²	2		n/a		N/A	



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CM-18 CI	oud	Тор				СТО	_SEVIRI_DS		
Туре			Dataset	Dataset					
Applications and us	sers		* Climate F agencies, F			MHSs, Governm blic Sector	ent		
Characteristics and Methods	Mean and I Cloud Top	Month Temp	ly Mea	ly, Daily Mean, Nan Diurnal Cycle re (CTT), Cloud Tesure (CTT)	for:				
Comments			Time series	from	01.0	1.2004-31.12.20	011		
Input satellite data			SEVIRI						
Dissemination									
Format	Format					Тур	е		
netcdf CF (Level 3) hdf5 (level 2)	F	ТР		offline					
			Accı	ıracy		<u> </u>			
Bias: -646.92 m, - Bias: -687.2 m, -1 Bias: -83.2 m, -1.3	1.6 %	Ġ(Ċ/	ALIOP)	ALIOP) stdv: 2149.1 m (CALIOP)					
Verification method	d		Validation a comparisor			udnet, Cloudsat/ ODIS	Calipso;		
	Cov	era	ge, resolut	ion a	nd tir	meliness	_		
Spatial coverage	Spat	ial r	esolution		Verti	cal resolution	Timeliness		
Meteosat disk	(0.0	5)² l	olution. leve evel 3 diurnal cycle				N/A		

CM-35 Clo	uc	d Op	tical Thicknes	ss	CO	T_SEVIRI	_disk_	_DS	
Туре			Dataset						
Applications and u	rs .	* Climate Res * NMHSs * Governmen		cies					
Characteristics and Methods		Daily Mean Monthly Mean	Level 2 hourly Daily Mean Monthly Mean Monthly Mean Diurnal Cycle						
Comments			Time series fr	om 01.	.01.2004-31.	12.2011			
Generation freque	ncy	/	N/A						
Input satellite data	3		SEVIRI						
			Dissem	inatio	n				
Format			Means			Type			
netcdf CF (Level 3 hdf5 (level 2))	FTP	offline						
			Accu	racy					
bias: 9.9 % rms: 32.4 %									
Verification metho	d	Com	parison with M	ODIS					
	C	Cove	rage, resoluti	on an	d timelines:	S			
Spatial specification coverage	Spatial resolution			Vertical resolution Timeliness					
<72° satellite (0	Pixel resolution. level 2 (0.05)² level 3 (0.25)² diurnal cycle				n/a N/A				



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CM-39	Clou	d Ph	ase		СР	H_SEVIRI_disk_DS
Туре	=		Dataset			
Applications an	d use	ers	* Climate Res * NMHSs * Governmen		cies	
Characteristics and Methods			level 2 hourly Daily Mean Monthly Mean Monthly Mean		al Cycle	
Comments			Time series fr	om 01.	.01.2004-31.	12.2011
Generation free	quenc	У	N/A			
Input satellite		SEVIRI				
			Dissem	inatio	n	
Format			Means			Type
netcdf CF (Leve hdf5 (level 2)	el 3)	FTP	offline			
		•	Accu	racy		
bias: -0.03 (MC rms: 0.11 (MO						
Verification me	thod	• Co	mparison with	MODIS	5	
		Cove	rage, resolut	ion an	d timelines:	s
Spatial coverage	Spatial resolution			Vertical resolution		Timeliness
Meteosat disk <72° satellite zenith angle	(0.0	5)² le	lution. level 2 evel 3 iurnal cycle	n/a		N/A

CM-44	Liqu	id Wa	ater Path		LWP_S	SEVIRI_disk_DS			
Туре	•		Dataset						
Applications an	ıd use	ers	* Climate Res * NMHSs * Government		cies				
Characteristics Methods	and		Level 2 hourly Daily Mean Monthly Mean Monthly Mean		al Cycle				
Comments			Time series fr	om 01	.01.2004-31.1	2.2011			
Generation free	quenc	ЗУ	N/A						
Input satellite	data		SEVIRI						
			Dissemi	natior	1				
Format			Means		7	Гуре			
netcdf CF (Level hdf5 (level 2)	el 3)	FTP			offline				
		•	Accur	асу					
bias: -0.3 % (Nrms: 33.6 %	MODI	S), -1	7 % (SSM/I)						
Verification me	thod	Com	parison with M	ODIS a	and LWP from	SSM/I			
	C	over	age, resolutio	on and	l timeliness				
Spatial coverage	Spatial resolution			Vertic	al resolution	Timeliness			
Meteosat disk <72° satellite zenith angle	(0.0	5)² le	lution. level 2 evel 3 iurnal cycle			N/A			



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CM-46	Ice W	/ate	er Path			IWP_SEVIRI_disk_ds		
Туре	-		Dataset					
Applications a	and use	ers	* Climate Rese * NMHSs * Government					
Characteristic Methods	s and		Level2 hourly Daily Mean, Mo Cycle	Daily Mean, Monthly Mean, Monthly Mean Diurnal				
Comments			Time series fro	m 01	1.01.2004-	31.12.2011		
Generation from	equen	СУ	N/A					
Input satellite	data		SEVIRI					
			Dissem	ninat	ion			
Format			Means			Туре		
netcdf CF (Le hdf5 (level 2)		FT	ъ		Offline			
			Accı	ıracy	/			
bias: -6.2 % rms: 37.8 %								
Verification method	C	Com	nparison with Mo	ODIS	;			
	(Cov	erage, resolut	ion a	and timeli	ness		
Spatial coverage	Spatial resolution			Vert resc	ical lution	Timeliness		
Meteosat disk <72° satellite zenith angle	(0.05)2	olution. level 2 evel 3 diurnal cycle			n/a		

CM-53	Surfa radia		ncoming	shortwa	⁄e	SIS_SEVIRI_disk_DS		
Туре	=		Dataset	Dataset				
Applications and u	users		* NMHS	nment age Sector		5		
Characteristics an	ıd Metl	nods	Daily Me Monthly					
Comments			time ser	ies from 0	1.01.	.12006-31.12.2011		
Generation freque	ency		N/A					
Input satellite dat	:a		SEVIRI/GERB					
			Dissen	nination				
Format			Means			Type		
netcdf CF		FTP,	CD-ROM offl			ine		
			Accı	ıracy				
Absolute bias: 7.2 W/m² monthly 14.8 W/m² daily r	y meai nean	าร						
Verification metho	od	com	parison v	vith in-situ	BSR	N measurements		
	Cove	rage	, resolut	ion and t	imel	iness		
Spatial coverage	Spatia	al res	solution	Vertical resolution		Timeliness		
Meteosat disk	(0.05	°)²				N/A		



Service Specifications

CM-61	Surf	ace A	lbedo			SAL_SEVIRI_disk_DS		
Туре	•		Dataset					
Applications an	d use	rs	* Climate * NMHSs * Governr	Research	cies			
Characteristics Methods	and		pentad Me Monthly M					
Comments			Time serie	es from 01.	01.20	004-31.12.2011		
Generation free	quenc	у	N/A					
Input satellite	lata		SEVIRI					
			Disse	mination				
Format			Means	5		Type		
netcdf CF		FTP,	CD-ROM		offlir	offline		
			Acc	Accuracy				
Threshold			Targe	t		Optimal		
50% (relative)		25%	(relative)		20%	(relative)		
Verification me	thod		ation at mo	ation at mast measurement sites & field paigns				
	Co	vera	ge, resolu	ition and	timel	liness		
Spatial coverage	Spat	ial re	solution	Vertical resolution		Timeliness		
Meteosat disk	(0.0	5) ²	<u></u>			N/A		

СМ-68		ace N ation	let Shortv	vave		SNS_SEVIRI_disk_DS	
Туре	-		Dataset				
Applications an	d use	ers	* Climate * NMHSs * Governr	Research	cies		
Characteristics Methods	and		Monthly M	lean			
Comments			time serie	s from 01.	01.12	006-31.12.2011	
Generation frequency			N/A				
Input satellite	data		SEVIRI/G	ERB			
			Diss	emination)		
Format			Means			Type	
netcdf CF		FTP,	CD-ROM	offline			
			Ad	ccuracy			
4.38 W/m ²							
Verification me	thod	calcu (SIS	llated based on accuracy of CM-61 (SAL) and CM-53				
	С	over	age, reso	ution and	time	eliness	
Spatial coverage	Spat	ial re	solution	Vertical resolution		Timeliness	
Meteosat disk	(0.0	5°)²				N/A	



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CM-75	Surfa Radia		utgoing	Longwav	е	SOL_SEVIRI_disk_DS			
Туре	-		Dataset	Dataset					
Applications and u	isers		* NMHSs	e Research iment age					
Characteristics an	d Meth	ods	Monthly	Mean					
Comments			time seri	es from 0	1.01.	12006-31.12.2011			
Generation freque	ncy		N/A	N/A					
Input satellite data	a		NWP (SE	NWP (SEVIRI)					
			Dissem	ination					
Format			Means			Type			
netcdf CF		FTP,	CD-ROM	offline					
			Accu	ıracy					
Absolute bias: 4.3	W/m ²								
Verification metho	d	com	parison w	ith in-situ	BSR	N measurements			
	Cove	rage	, resolut	ion and t	meli	ness			
Spatial coverage	Spatia	al res	olution	Vertical resolution	1	Timeliness			
Meteosat disk	(0.05	°)²				N/A			

CM-82		ace D		Longwav	е	SDL	_SEVIRI	_disk_	_DS
Туре	-		Dataset						
Applications an	d use	rs	* NMHSs	* Climate Research * NMHSs * Government agencies					
Characteristics Methods	and		Monthly M	lean					
Comments			time serie	time series from 01.01.12006-31.12.2011					
Generation free	uenc	У	N/A						
Input satellite of	lata		SEVIRI						
			Disse	Dissemination					
Format			Means	Means			Type		
netcdf CF		FTP,	CD-ROM	offline					
			Ac	curacy					
Absolute bias: 9	9.6 W	/m²							
Verification me	thod	comp	oarison wit	h in-situ BS	SRN n	neasur	ements		
	С	over	age, resol	ution and	time	liness			
Spatial coverage	Spat	ial res	solution	Vertical resolution		Timeli	ness		
Meteosat disk	(0.05	5°)²				N/A			



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CM-89	Surf	ace N	let Longw	ave Radia	tion	SNL SEVIRI disk DS		
Туре	_		Dataset					
Applications an	d use	rs	* Climate * NMHSs * Governr	Research	ies			
Characteristics Methods	and		Monthly M	thly Mean				
Comments			time serie	s from 01.	01.12	006-31.12.2011		
Generation free	uenc	у	N/A					
Input satellite of	lata		SEVIRI					
			Diss	emination)			
Format			Means	S	Type			
netcdf CF		FTP,	CD-ROM		offline			
			Α	ccuracy	•			
Absolute bias:	12 W/	m²						
Verification me	thod	calcu (SDL		ed on accuracy of CM-75 (SOL) and CM-82				
Coverage, resolution and timeliness								
Spatial coverage	Spat	ial re	solution	Vertical resolution		Timeliness		
Meteosat disk	(0.0	5°)²				N/A		

CM-96	Surfa	ce Ra	adiation Bu	ıdget		SRB_SEVIRI_DS		
Туре	-		Dataset					
Applications and users			* Climate Research * NMHSs * Government agencies					
Characteristics Methods	and		Monthly Me	ean				
Comments			time series	from 01.01	.1200	06-31.12.2011		
Generation frequency			N/A					
Input satellite d	ata		SEVIRI					
			Dissem	ination				
Format			Means			Type		
netcdf CF		FTP,	CD-ROM			offline		
			Accu	racy				
Absolute bias: 1	16 W/m	1 ²						
Verification met	hod	calcu 68 (S	llated based on accuracy of CM-89(SNL) and CM- SNS)					
	Co	verag	e, resoluti	on and tim	eline	SS		
Spatial coverage	Spati	al reso	olution	Vertical resolution		Timeliness		
Meteosat disk	(0.05	5°)²				N/A		



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CM-103	Cloud	d Rad	iative Effe	ct LW		CFL_SEVIRI_DS	
Туре	-		Dataset				
Applications and	users		* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector				
Characteristics a Methods	nd		Monthly Mean				
Comments			time series from 01.01.12006-31.12.2011				
Generation frequ	iency		N/A				
Input satellite da	ita		SEVIRI/GERB				
			Dissem	ination			
Format			Means	5	Туре		
netcdf CF		FTP,	CD-ROM offlin			ne	
			Accı	ıracy			
Absolute bias: 4.	.1 W/r	n²					
Verification method calcula			lated from i	adiation pro	oducts	and CM-06 (CFC)	
	Co	vera	ge, resolut	ion and tin	neline	ess	
Spatial coverage	Spati	al res	olution	Vertical resolution		Timeliness	
Meteosat disk	(0.05	5°)²				N/A	

CM-102	Clou	d Radi	iative Effe	ct SW		CFS_SEVIRI_DS		
Туре			Dataset					
Applications and users			* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector					
Characteristics a Methods	and		Monthly Mean					
Comments			time series from 01.01.12006-31.12.2011					
Generation freq	uency		N/A					
Input satellite d	ata		SEVIRI/GERB					
			Dissem	nination				
Format			Means			Type		
netcdf CF		FTP,	CD-ROM offlir			ne		
		2	Accı	ıracy				
Absolute bias: 7	' W/m²	2						
Verification met	hod	calcul 61, S	llated from radiation products (CM-53, SIS and CM-SAL)					
	Co	verag	je, resolut	ion and tin	neline	ess		
Spatial coverage	Spat	ial reso	olution	Vertical resolution		Timeliness		
Meteosat disk	(0.0	5) ²				N/A		



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CM-105	Direc	t Irra	diance at	Surface		SID_SEVIRI_DS	
Туре	•		Dataset				
Applications and users			* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector				
Characteristics a Methods	nd		,	Daily Mean Monthly Mean			
Comments			time series	from 01.01	.1200	06-31.12.2011	
Generation frequency			N/A				
Input satellite da	ita		SEVIRI				
			Dissemir	nation			
Format			Means	5	Туре		
netcdf CF		FTP			offline		
			Accura	асу			
Absolute bias: 11.0 W/m² mont 20.2 W/m² daily							
Verification meth	od	comp	arison with	in-situ mea	surem	nents	
	Cov	erage	, resolutio	n and time	lines	5	
Spatial coverage	Spati	al res	olution	Vertical resolution		Timeliness	
Meteosat disk	(0.05	5°) ²				N/A	

CM-107	Spec	trall	y Res	solved Irra	diance	SRI_MVIRI_SEVIRI_DS	
Туре			Data	set			
Applications	and u	sers	* Ag * Me	lar energy coriculture me edicine meteo mate commo	teorology (e orology.		
Characteristi Methods	cs an	d	Daily	and Monthl	y Mean.		
Comments			Time	series 01.0	1.1991-31.1	2.2011	
Generation f	reque	ncy	N/A				
Input satellit	e data	а	MVIRI continued with SEVIRI				
				Dissemi	nation		
Format			Ме	eans	Туре		
Netcdf CF		FTP		Offline			
				Accui	асу		
Relative bias < 5 %, for s < 12% for s	pectra				1		
Verification method Comparis			paris	son with ground based data as far as available			
Coverage, resolution and timeliness							
Spatial coverage	Spat reso	ial Iution	Spectral res		solution	Timeliness	
Meteosat disk	Meteosat 0.05° x 0.05		.05°	20 ¹ Kato bands in VIS and NIR spectrum		N/A	

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



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CM-110	Dayli	ght				DAL_MVIRI	DS	
Туре	-		Dataset					
Applications and	users		* NMHSs * Governm * Private S	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector				
Characteristics a Methods	nd		Daily Mean Monthly Mean					
Comments			time series	from 01.01	.1983	-31.12.2005		
Generation frequ	iency		N/A					
Input satellite da	ata		MVIRI					
			Dissem	ination				
Format			Means		Туре			
netcdf CF		FTP		offlir		ne		
			Accu	racy				
Absolute bias: 2	.0 W/n	n²						
Verification meth	ification method comparison with in-situ measurements, only one sta was available for validation			ition				
	Co	vera	ge, resoluti	ion and tim	eline	ss		
Spatial coverage	Spati	al res	olution	Vertical resolution		Timeliness		
Meteosat disk	(0.05	°) ²				N/A		

CM-109	Daylig	jht				DAL_SEVIRI_DS	
Туре	=		Dataset	Dataset			
Applications and users			* NMHSs * Governm * Private S	* Climate Research * NMHSs * Government agencies * Private Sector * Public Sector			
Characteristics a Methods	ınd		,	Daily Mean Monthly Mean			
Comments			time series from 01.01.2006-31.12.2011				
Generation frequency			N/A				
Input satellite da	ata		SEVIRI/GERB				
			Dissem	ination			
Format			Means	5	Type		
netcdf CF		FTP		offline			
	÷		Accu	racy			
Absolute bias: 2	.0 W/m	2					
			parison with in-situ measurements, only one on was available for validation				
Coverage, resolution and timeliness						ss	
Spatial coverage	Spatia	l res	olution Vertical resolution			Timeliness	
Meteosat disk	(0.059	²) ²				N/A	



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CM-21012 S	EVIRI Fract	ional Cloud	Cover ICDR	CF	C_SEVIRI	_disk_	_DS_	R3
Туре		Data record						
Applications a	nd users	Climate Rese	earch & Climate N	1ode	lling			
Characteristics Methods	s and	level2 full te	mporal resolutior	1				
Record length	/ Period	Jan 2004 – 3	31. December 20	12				
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)						
		Diss	emination					
Format		Means			Туре			
Hdf5		FTP, WEB			offline			
		A	ccuracy					
Cloud POD: 0.	946 ± 0.008	for CALIOP	and 0.902 ± 0.0)11	for CPR			
Verification me	/erification method comparison against CALIPSO datasets							
	Coverage, resolution and timeliness							
Spatial coverage	Spatial reso	lution	Vertical resolution	Tin	Timeliness			
Meteosat disk	Pixel resoluti	on level 2	n/a	N//	N/A			

CM-23081	Meteosat C	oud Albed	lo TCDR		CAL_MVIRI_SEVIRI_DS_R1	
Туре	-	Dataset				
Applications an	d 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 Methods	and	hourly, dail	y and monthl	y me	ans	
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)				
		Dis	semination			
Format		Means			Туре	
Netcdf CF		FTP, Web			offline	
		P	Accuracy			
0.1 for monthly latitudes above					of the winter period for ght occur	
Verification me	thod	accuracy estimated based on derived SIS accuracy				
	Cove	erage, reso	olution and	time	eliness	
Spatial coverage	Spatial resol	Vertical resolution	Tim	eliness		
Meteosat disk	(0.05°) ²		n/a	N/A		



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CM-23201		at Solar Su on TCDR	urface SIS_	MVIF	RI_SEVIRI_DS_R1	
Туре	-	Dataset				
Applications and us	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, da	ily and monthly	/ mea	ns	
Record length / Per	iod	1983-2012				
Comments						
Traceability of Requ	SAF/CM/DWD/RR2.1 v 1.1 dated 05.07.2013					
Input satellite data		MVIRI/SEVIRI (Rectified digital pixel counts)				
		Dissemi	nation			
Format		Means			Type	
Netcdf CF		FTP, Web			offline	
		Accur	асу			
Daily: Acc. (MAB) 1 Monthly: Acc. (MAB Dec. stab.vs BSRN:): 5.5 W/m		ecade)			
Verification method		comparison with BSRN ground measurements				
	Coverage	, resolutio	on and timelin	ess		
Spatial coverage	Spatial r	esolution	Vertical resolution	Tim	Timeliness	
Meteosat disk	(0.05°)²	!	n/a	N/A	N/A	

CM- 23231	Meteosat D Irradiance		nalised	DNI	_MVIRI_SEVIRI_DS_R1	
Туре		Dataset				
Application	ns and users	and developm	opment , Ćlir	nate , Ag	ricultural planning and	
Characteri Methods	stics and	hourly, da	ily and mont	hly n	neans	
Record len	gth / Period	1983-2012	2			
Comments	;					
Traceabilit Requireme	•	SAF/CM/DWD/RR2.1 v 1.1 dated 05.07.2013				
Input sate	llite data	MVIRI/SEVIRI (Rectified digital pixel counts)				
		Dis	semination			
Format		Means Type			Туре	
Netcdf CF		FTP, Web offline			offline	
		ı	Accuracy			
	racy (MAB) 3 cc. (MAB) 17.					
Verification	n method	compariso	n with groun	d me	easurements	
	Cov	erage, res	olution and	time	eliness	
Spatial coverage	I Shafiai resollition		Vertical resolution	Time	eliness	
Meteosat disk	(0.05°) ²		n/a	N/A		



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CM-21011 SE	VIRI Fract	ional C	Cloud Cove	er ICDR CFC_	_SEVIRI_disk_DS_R	
Туре	-					
Applications ar	nd users		Climate Ro Agencies	esearch & NMI	HSs & Governm.	
Characteristics	and Method	ds			olution), daily mean, mean diurnal cycle	
Record length	/ Period		2004-201	5		
Comments			Contains a	as additional la	yer: cloud type	
Traceability of	Requiremen	its	SAF/CM/C 13.06.201	, ,	R 2.4 v 1.2 dated	
Input satellite	data		SEVIRI (M	SG-1, MSG-2	MSG-3)	
			Dissemina	tion		
Format			Means		Туре	
Netcdf4 CF (le	vel 2 and 3)		FTP, WEB	. WEB offline		
			Accurac	:y		
Bias: ≈ 3% (C L2 PODcld: 87 L2 FARcld: 16. L3 bc-rms: 10	.5% (CALIO 9% (CALIOF	P)	,			
Verification me	ethod	3: prin	narily comp emented w	parisons with S	y checks against	
	Cove	rage, r	esolution	and timeline	ess	

Pixel resolution level 2 (0.05)² level 3

 $(0.25)^2$ monthly mean

diurnal cycle

n/a

N/A

Meteosat

disk

CM- 12001 M	icrowave Radia	nce FCD	R R2		FCDR_SSMI_DS_R2	
Туре		Dataset				
Applications	s 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				
Characteris	tics and Methods	swath-ba	ased product, ir	nag	er channels similar to SSM/I	
Record leng	th / Period	1987-20	13			
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 satell	ite data	SSM/I, SSMIS				
		Dis	semination			
Format		Means			Туре	
Netcdf4 CF		FTP, WE	В		offline	
		A	Accuracy			
Accuracy (bi decadal sta	as): ≤ 1K bility: < 0.03 K/d	ecade for	all channels			
Verification	method	Inter-se	nsor comparis	on		
	Covera	ige, reso	olution and ti	me	liness	
Spatial coverage	Spatial resolution	า	Vertical resolution	Tin	neliness	
global	sensor resolution		n/a	N/A	4	



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CM-21021 Join	it Clo	oud	Histogra	ams		JCH_SEVIRI_disk_DS_R	₹2		
Type			Dataset						
Applications and u	users	5	* Climate	e Researc	h				
Characteristics and Methods CM-210. 21031)				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 / Pe	eriod		Time ser	ies from :	2004	1-2015			
Traceability of requirements			SAF/CM/ 13.06.20		NMI,	/RR2.4 v1.2, dated	2, dated		
Generation freque	ency		N/A	N/A					
Input satellite dat	a		CTO (CM-21031), CPH (CM-21041), COT (from CM-21051)						
		•	Diss	eminati	on				
Format			Means	S		Туре			
Netcdf4 CF	F	FTP			offli	ne			
			Α	ccuracy					
N/a (depends on CTO (CM-21031).		accui	racy of C	OT (CM-2	105	1), CPH (CM-21041) and			
Verification method	od r	n/a							
	Cov	era	ge, reso	lution a	nd ti	imeliness			
Spatial coverage	Spat reso		on	Vertical resolutio	n	Timeliness			
Meteosat disk <84° satellite zenith angle	(0.2	.5°)²		n/a		N/A			

CM-21031 S	EVIRI	Cloud	Top Level ICDR	C.	TO_SEVIR	RI_DS_R2				
Type		Datase	Dataset							
Applications and users	d		e Research, NMHSs & (e & Public Sector	Gover	nment Age	encies,				
Characteristics Methods	and		(full temporal resolution							
Record length		2004-2	2015							
Comments		and bo	Requirements are specified for CTH and CTP (as bias and bc-rms). No requirements are specified for CTT a this parameter represents the same information in different units.							
Traceability of Requirements		SAF/C	M/CDOP2/KNMI/RR2.4	v1.2,	, dated 13.	06.2014				
Input satellite of	lata	SEVIR	I (MSG-1, MSG-2, MSG	G-3)						
			Dissemination							
Format			Means	-	Туре					
Netcdf4 CF (leve	l 2 and	3)	FTP, WEB	C	offline					
			Accuracy							
CTH, L2 bc-rms CTH, L3 bc-rms	s: 2398 s: 949 r . hPa (0 : 62.7	m (CA m (MOE CALIOP) hPa (M	DIS) (), -58.6 hPa (MODIS) (ODIS)							
Verification me	thod		omparisons with MODI CloudSat/CALIPSO, Earl							
	Co	verage	, resolution and time	elines	SS					
Spatial coverage	Spatia	l resolu	ution	Verti reso	ical lution	Timelines s				
Meteosat disk	(0.05)	² level 3	n level 2 3 ally mean diurnal cycle	n/a		N/A				



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CM-21041 SEVIE	RI Cloud P	ha	ase ICDR R2		CPH_SEV	IRI_DS_R2	
Туре		D	Dataset				
Applications and use	rs		limate Research, rivate & Public Se		& Governmer	nt Agencies,	
Characteristics and N	1ethods		evel2 (full tempora nonthly mean, mo				
Record length / Perio	d	2	004-2015				
Comments							
Traceability of Requi	rements	S	AF/CM/CDOP2/KN	MI/RR	24 v1.2 dated	13.06.2014	
Input satellite data		S	EVIRI (MSG-1, MS	SG-2, N	1SG-3)		
			Dissemination				
Format			Means	Туре			
Netcdf CF (lev 3), Ho	lf5 (lev 2)		FTP, WEB		offline		
			Accuracy				
Bias: ≈ 0% (CALIOP)), 1% (MO	DI	S)				
L2 PODliq: 85.5 % (CL2 FARliq: 10% (CALL2 PODice: 88.9% (CL2 FARice: 16% (CALL3 bc-rms:8.7 % (MC)	IOP) CALIOP) LIOP)						
Verification method		comparison with MODIS (2004-2014), comparison with Cloudsat/Calipso (2007-2014, level-2, selected months)					
	Coverage	e,	resolution and t	timelin	ess		
Spatial coverage	Spatial re	so	lution	Vertica	al resolution	Timeliness	
Meteosat disk (day and night)	$(0.05)^2$ le	ve	nthly mean	n/a		N/A	

CM-21051 SI	VIRI Li	quid	Water Path ICDR	L	.WP_S	SEVIRI_DS_R2	
Туре			Dataset				
Applications an	d users		Climate Research, NMH Agencies, Private & Pub			ment	
Characteristics	and Meth	nods	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle, 1D histograms				
Record length /	Period		2004-2015				
Comments			Contains as additional I thickness), REFF (partic scene heterogeneity me	le effe	ective i		
Traceability of I	Requirem	ents	SAF/CM/CDOP2/KNMI/RR24 v1.2 dated 13.06.2014				
Input satellite o	lata		SEVIRI (MSG-1, MSG-2	, MSG	-3)		
			Dissemination				
Format			Means Typ				
Netcdf CF (leve Hdf5 (level 2)	l 3)		FTP, WEB offline				
			Accuracy				
Bias: 6.17 g m-	-2 (UWiso	c), 2.0	05 g m-2 (MODIS)				
L2 bc-rms: 34 g L3 bc-rms : 11) sc), 6.50 g/m² (MODIS)				
Verification me	thod		parison with satellite-bas ocean (e.g. LWP_HOAPS				
	Co	verag	e, resolution and time	elines	S		
Spatial coverage	Spatial	resolu	tion	Vertic		Timeliness	
Meteosat disk <84° satellite zenith angle	$(0.05)^2$	level	on level 2 3 hly mean diurnal cycle	n/a		N/A	



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CM-21061 SEVIR	I Ice	Wat	er Path ICDF	R R2	IWP_SEVIRI_DS_R2		
Туре			Dataset				
Applications and use	rs		Climate Rese Agencies, Pri		s & Government : Sector		
Characteristics and M	1ethod	ds	level2 (full temporal resolution), daily mean, monthly mean, monthly mean diurnal cycle, 1D histograms				
Record length / Perio	od		2004-2015				
Comments				EFF (particle	ers: COT (cloud optical effective radius) , and measure)		
Traceability of Requi	remer	nts	SAF/CM/CDO	P2/RR/24 v1	2 dated 13.06.2014		
Input satellite data			SEVIRI (MSG	-1, MSG-2, N	MSG-3)		
			Disseminat	tion			
Format			Means		Туре		
Netcdf CF (level 3) Hdf5 (level 2)			FTP, WEB		offline		
			Accurac	у			
Bias: -5.11 g/m² (M0 L3 bc-rms: 14.82 g/r			5)				
Verification method			ted months),		07-2014, level-2, with MODIS (2004-		
	Cove	rage	, resolution	and timelin	ess		
Spatial coverage	Spati	ial re	solution	Vertical resolution	Timeliness		
Meteosat disk <84° satellite zenith angle	(0.05)	5)² le	lution level 2 evel 3 nonthly mean ccle	n/a	N/A		



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

CM- 12002 Microwave Radia	nce FCDR R3	FCDR_SSMI_DS_R3				
Туре	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, imag	er 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). Additionall 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	Туре				
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				
Covera	ge, resolution and time	liness				



Service Specifications

		Reflected Solar A	II-Sk	cy	TRS_AS_MVIRI_GERB_SE VIRI_disk_DS					
Туре		Dataset	Dataset							
Applications and users	5	* NMHSs	* Climate Research * NMHSs * Government Agencies							
Characterist and Method		daily mean, mont	hly n	nean, m	nonthly mean diurnal cycle					
Record leng Period	th /	01.02.1982-30.04	4.201	15						
Comments										
Traceability Requiremen		SAF/CM/CDOP2/R 24.12.2014	RMIB	/GERB/I	RR2.6, v3.0, dated					
Input satelli data	ite	MVIRI, SEVIRI								
		Diss	emi	nation						
Format		Means		Type						
Netcdf CF		FTP, WEB		offline						
		A	ccur	асу						
RMS error of	of the uracy	monthly mean: 3.0 daily mean: 6.5 W : 11.0 W/m ²		m²						
Verification method		comparison with (resolution.	CERE	S/AVHF	RR. Accuracy at 1°x1°					
		Coverage, reso	lutio	n and	timeliness					
Spatial coverage	Spat	tial resolution	Vert reso	ical lution	Timeliness					
Meteosat disk	(0.0	5°)²	n/a		N/A					

	OA Emitted adiative Flu		I All-Sky	TET_AS_N	_	GERB_S _DS_R1			
Туре		Dataset	Dataset						
Applications	and users	* NMHS	te Research s nment Agencie	es					
Characteris Methods	tics and	daily me diurnal o	ean, monthly n	nean, montl	nly mear	า			
Record leng	th / Period	01.02.1	982-30.04.201	.5					
Comments									
Traceability Requiremen		SAF/CM/CDOP2/RMIB/GERB/RR2.6, v3.0, dated 24.12.2014							
Input satell	ite data	MVIRI, SEVIRI (reprocessed CF version)							
		Dis	semination						
Format		Means		Type	Type				
Netcdf CF		FTP, WEB offline							
			Accuracy	-					
RMS error of MMDC acco	of the monthl of the daily m uracy: 3.5 W W/m² (exce	nean: 4.2 /m²		vhich are fla	agged)				
Verification	method	comparison with CERES/HIRS dataset/AVHRRAccuracy at 1°x1° resolution.							
	Cover	age, res	olution and t	imeliness					
Spatial coverage	Spatial reso	lution	Vertical resolution	Timeliness	Timeliness				
Meteosat disk	(0.05°)²		n/a	N/A					



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

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CM- 11011 AVHRR GAC Fractional Cloud Cover TCDR R2 CFC_AVHRR_g lobal_DS_R2							
Туре	Dataset						
Applications and users	Climate Research, NMHSs & Governm Agencies, Private & Public Sector	ent					
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						
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	5.2014					
Input satellite data	AVHRR GAC						
	Dissemination						
Format	Means	Type					
Netcdf CF	FTP, Web	Offline					
	Accuracy						
monthly bias: -3.2 % CFC da bc-rms daily, monthly: 6.7 – Decadal stability: -1.3 %							
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.							



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		ud Histog AC TCDR			JCH_AVHRR_global_DS_R2		
Туре		Dataset					
Applications and	users	* Climat	e Resear	ch			
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.					mbination of COT (from M-11041) and CTO (CM-		
Comments		Time ser	ries from	19	82-2015		
Generation frequ	uency	SAF/CM/	SAF/CM/DWD/RR2.2 v1.1, dated 17.06.2014				
Input satellite d	CTO (CM-11031), COT (from CM-11051), CPH (CM-11041)						
		Dis	seminat	ioı	n		
Format		Means			Type		
Netcdf CF		FTP	FTP		offline		
		- 1	Accuracy	,			
Threshold		Targ	get		Optimal		
n/a		n/a	n/a		n/a		
Verification met	hod						
	Cove	rage, res	olution a	ınc	d timeliness		
Spatial sp	atial re	solution	Vertical resolution		Timeliness		
Global (19	°)²		n/a		N/A		

CM- AVHRR GAC Cloud Top Level CTO_AVHRR_global_DS_R2								
Type	-	Dataset						
Applicatio	ns and users	Climate Research, Agencies, Private 8						
Character Methods	istics and	daily level2b files (node), daily mean,						
Record le	ngth / Period	1982-2015						
Comment	S	CTT: no specific rec same information i						
Traceabili Requirem	,	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014						
Input sate	ellite data	AVHRR GAC						
		Dissemination	n					
Format		Means Type		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	n method		SCCP, PATMOS-X, MODIS dsat/Calipso (2007-2013)					
	Covera	ge, resolution and	d tin	neliness				
Spatial coverage	Spatial resolution	esolution		tical olution	Timeliness			
Global	(0.05) ² level2b, (0.25) ² level3 polar areas in EASE-grid (5km for level2, 25 km for level3)).				N/A			



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CM- 11041	AVHRR GAC	Cloud Phase 1	rcdr c	PH_AVHRI	R_global_DS_R2	
Туре		Dataset				
Application	ns and users	* Climate Resear * NMHSs * Government				
Characteris Methods	stics and	daily level2b file ascending/desc			n, monthly mean	
Record len	gth / Period	1982-2015				
Comments						
Traceability Requireme	•	SAF/CM/DWD/F	RR2.2 v1.1da	ated 17.06.2	014	
Input satel	llite data	AVHRR GAC				
		Disser	nination			
Format		Means		Туре		
Netcdf CF		FTP, Web		offline		
		Acc	Accuracy			
monthly, d	laily bias 0.01 laily bc-rms: ability: 0.016	0.06 - 0.16				
Verification	n method	comparison with ISCCP, PATMOS-X, MODIS (2000- 2013), Cloudsat/Calipso (2007-2013)				
	Co	verage, resolu	tion and tin	neliness		
Spatial coverage	Spatial resol	ution	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- AVHRR GAC Liquid Water Path 11051 TCDR R2 LWP_AVHRR_global_DS_R2								
Туре	Data	set						
Applications and users		ate Research, NMH ate & Public Sector	HSs & Government Agencies,					
Characteristics and Methods		level2b files (per mean, monthly m	satellite in asc./desc. node), nean					
Record length / Period	1982	2-2015						
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							
	D	issemination						
Format	Means		Type					
Netcdf CF	FTP,	Web	offline					
	Accuracy							
monthly, daily bias: -3.40 monthly, daily bc-rms: $11 - 2$ Decadal Stability: $1.0 - 2.3$ g	20 gm		gm-2					
Verification method	Validation with satellite-based MWR retrieved LWP over ocean, comparison with ISCCP, PATMOS-X, MODIS (2000-2013)							
Coverag	je, re	solution and tim	eliness					
Spatial coverage Spatial resolution		Vertical resolution	Timeliness					
Global (0.05)² level2b, (daytime) (0.25)² level3		n/a	N/A					



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	TWD AVHDD global DS D2						
Туре	-	Dataset					
Application	ns and users		esearch, NMF Public Sector	lSs 8	k Government Agencies,		
Characteris Methods	stics and		2b files (per nonthly m		lite in asc./desc. node),		
Record len	gth / Period	1982-201	5				
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.					
Traceabilit Requireme		SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014					
Input sate	llite data	AVHRR GAC					
		Di	ssemination	n			
Format		Means			Туре		
Netcdf CF		FTP, Web			offline		
			Accuracy				
monthly, c	laily bias: -0. laily bc-rms: tability: 2.7 –	20 – 31 gn	n-2 and -7.4 n-2	- 8.0	6 gm-2		
Verification	n method	Validation with Cloudsat/Calipso (2007-2013), comparison with ISCCP, PATMOS-X, MODIS (2000-2013)					
	Cov	erage, re	solution and	d tim	neliness		
Spatial coverage	Spatial resol	olution Vertical resolution Timeliness			eliness		
Global (daytime)	(0.05) ² leve (0.25) ² leve		n/a	N/A			

CM- 11201	AVHRR GAC Surfa Shortwave Radia			_AVI	IRR_global_DS_R2		
Type	SHOPEWAYE RUGHE	Dataset					
Applicatio	ns 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)					
Character	istics and Methods	monthly r	neans, daily	mear	IS		
Record le	ngth / Period	1982-201	5				
Comment	S						
Traceabili	ty of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014					
Input sate	ellite data	AVHRR GAC					
		Dissemi	nation				
Format		Means			Туре		
Netcdf CF		FTP, Web		offline			
		Accu	racy				
MAB daily:	hly: 9.5 W/m² 18.9 W/m² ability: 1.2 W/m²						
Verificatio	n method	comparison with BSRN					
	Coverage	, resoluti	on and time	lines	s		
Spatial coverage	Spatial resolution		Vertical resolution	Time	eliness		
global	0.25x0.25 °		n/a	N/A			



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products in EAS (25 km for level		

CM- 11221	SAI AVHDD global DS D7						
Туре		Dataset					
Application	ns and users	* Climate * NMHSs * Governn	Research ment Agencies				
Characteris Methods	stics and	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 len	gth / Period	1982-2015					
Comments	3						
	Traceability of Requirements		SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014				
Input sate	llite data	AVHRR GAC					
		Dis	semination				
Format		Means			Type		
Netcdf CF		FTP, Web			offline		
		-	Accuracy				
	tive retrieval ability: 8.5 %		%				
Verification method region			Comparison with surface measurements for different regions +comparisons with albedo estimations from other platforms				
	Cove	erage, res	olution and	time	eliness		
Spatial coverage	Spatial resol	ution	Vertical resolution	Time	eliness		
global	(0.25) ² leve For polar are		n/a	N/A			



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CM- 11251	AVHRR GAO Longwave I				SOL_AVHRR_global_R2		
Туре	-	Dataset					
Application	ns and users	* Climate Monitoring and Analysis (EURO4M) * NWP & climate model validation (DWD, COSMO CLM)					
Characteri Methods	stics and	monthly m	neans				
Record len	gth / Period	1982-201	5				
Comments	5						
Traceability of Requirements		SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014					
Input sate	llite data	AVHRR GAC					
		Dis	semination				
Format		Means		Туре			
Netcdf CF		FTP, Web			offline		
			Accuracy				
	hly: 13.7 W/r tability: 0.5 W						
Verification	n method	comparison with BSEN					
	Cove	erage, res	olution and	time	eliness		
Spatial coverage	Spatial resol	ution	Vertical resolution	Time	eliness		
global	0.25x0.25 °		n/a	N/A			

CM- AVHRR GAC 11261 Downwellin Radiation T	g Longwa	ve SDL	AV	/HRR_global_DS_R2
Туре	Dataset			
Applications and users	* Climate Monitoring and Analysis (EURO4M) * NWP & climate model validation (DWD,COSMO CLM)			
Characteristics and Methods	monthly m	neans		
Record length / Period	1982-2015	5		
Comments				
Traceability of Requirements	SAF/CM/DWD/RR2.2 v1.1dated 17.06.2014			
Input satellite data	AVHRR GAC			
	Dis	semination		
Format	Means			Type
Netcdf CF	FTP, Web			Offline
		Accuracy		
MAB monthly: 7.9 W/m Decadal Stability: 0.4 W				
Verification method	comparison with BSEN			
Cove	erage, reso	olution and	time	eliness
Spatial coverage Spatial resol	· Spatial resolution		Timeliness	
global 0.25x0.25 °		n/a	N/A	