

**EUMETSAT Satellite Application Facility
on Support to Operational Hydrology
and Water Management
(H-SAF)**

Data Output Format (DOF-14)

SM-DAS-2

**Soil Wetness Index in the Root Region by surface
wetness scatterometer assimilation method**

Reference Number:

SAF/HSAF/DOF

Issue/Revision Index:

Issue 1.2

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DOCUMENT SIGNATURE TABLE

	Name	Date	Signature
Prepared by :	H-SAF Project Team	06/01/2012	
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DOCUMENT CHANGE RECORD



Issue / Revision	Date	Description
Version 1.0	06/01/2012	Baseline Release prepared for ORR1 Part3
Version 1.1	10/02/2012	Account for ORR1 Part 3 RiDs
Version1.2	24/01/2013	File name convention updated with “H14” replace by “h14”

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1 Introduction

1.1 Purpose

This document provides a specification of the data out format relevant to the main process defined in the EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management (H-SAF).

Whenever a common specification is possible for data inside the whole system it is here given as a HSAF data output format; otherwise, it is given as a HSAF cluster data output format, since it is used only inside a specific subsystem.

1.2 Scope

Other HSAF document previously delivered, here traced in the Applicable Document list, already define a data specification in terms of product content, media, support type, file format and interface specification. DOF-14 is aimed to provide further details starting from there.

DOF-14 is focused on product SM-DAS-2 “Soil Wetness Index in the Root Region by surface wetness scatterometer assimilation method”, also identified as H14.

1.3 Document Overview

Section 1 (Introduction)



Section 2 presents the Product Format drivers, starting point for the product format definition. It is here shown the link between requirements and product formats

Section 3 describes the product file name; involved files are here mentioned. Namespace of the products and file type are also reported

Section 4 provides a detail of the H-SAF input data formats; content, provider, media, format and component involved are here mentioned for a summary view of the data formats

Section 5 defines the internal data format. Product metadata are here documented

Section 6 traces the product formats as they are disseminated. For each of the dissemination media (EUMETCast, GTS, FTP) and for each product, its format, source and destination is reported

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1.4 References

1.4.1 Applicable documents

- [AD 1] H-SAF CDOP Proposal – 2.3, March 2010
- [AD 2] H-SAF Project Plan (PP). Ref.: SAF/HSAF/PP/3.0
- [AD 3] H-SAF Configuration Management Plan (CMP). Ref.: SAF/HSAF/CMP/1.0
- [AD 4] H-SAF Users Requirement Document (URD). Ref.: SAF/HSAF/URD/2.1
- [AD 5] H-SAF SAF Preliminary Design Review Organization Note. Ref.: EUM/PPS/PRC/06/0125
- [AD 6] H-SAF System Requirements Document (SRD). Ref.: SAF/HSAF/SRD/2.1
- [AD 7] H-SAF System Design Document (SDD). Ref.: SAF/HSAF/SDD/2.1
- [AD 8] H-SAF Component Requirements Document (CRD). Ref.: SAF/HSAF/CRD/1.1
- [AD 9] H-SAF Component Design Document (CDD). Ref.: SAF/HSAF/CDD/1.1
- [AD 10] H-SAF Interface Control Document (ICD). Ref.: SAF/HSAF/ICD/1.1
- [AD 11] Algorithmic Software Development Guidelines Document (ASDGD). Ref.: SAF/HSAF/ASDGD/0.1
- [AD 12] System Integration, Verification & Validation Plan (SIVVP). Ref.: SAF/HSAF/SIVVP/1.1
- [AD 13] Guide to Software Configuration Management. Ref.: ESA PSS-05-09 Issue 1 Rev.1
- [AD 14] SAF Software Development Guidelines. Ref.: SAF/NET/EUM/SW/GD/MTR/01
- [AD 15] H-SAF Component Verification File (CVERF). Ref.: SAF/HSAF/CVERF/1.1
- [AD 16] H-SAF Hydrological Validation Plan (REP-2). Ref.: SAF/HSAF/CDR-1/Rep-2
- [AD 17] H-SAF Algorithmic Software Development Guidelines Document (ASDGD) – internal issue – Ref.: SAF/HSAF/ASDGD/0.5
- [AD 18] H-SAF System Verification File (SVERF). Ref.: SAF/HSAF/SVERF/0.6
- [AD 19] Algorithms Theoretical Definition Document (ATDD). Ref.: SAF/HSAF/ATDD/1.0

1.4.2 Reference documents

- [RD 1] EUM.TD.08 MSG - Image Data Dissemination Service
 - [RD 2] EPS AMSU-A L1 Product Generation Specification
 - [RD 3] EPS AMSU-A L1 Product Format Specification
 - [RD 4] EPS MHS L1 Product Generation Specification
 - [RD 5] EPS MHS L1 Product Format Specification
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- [RD 6] MetOp-AVHRR documentation VCS Engineering website (<http://rst.vcs.de/>)
 - [RD 7] NASA-MODIS documentation at NASA website (<http://directreadout.gsfc.nasa.gov/index.cfm>)
 - [RD 8] Meteosat-SEVIRI documentation at EUMETSAT website (http://www.eumetsat.int/Home/Main/What_We_Do/Satellites/Meteosat_Second_Generation/index.htm?l=en)
 - [RD 9] EUMETSAT-EUMETCast documentation at EUMETSAT website (http://www.eumetsat.int/Home/Main/What_We_Do/EUMETCast/index.htm?l=en)
 - [RD 10] EPS NRT User Interface Specification. Ref.: EPS-ASPI-IR-0648
 - [RD 11] National Oceanic and Atmospheric Administration (NOAA) Low-Rate Information Transmission (LRIT) System. Ref.: <http://noaasis.noaa.gov/LRIT/>
 - [RD 12] WMO - WWWDM specifications. Ref.: <http://www.wmo.ch/web/www/WDM/wdm.html>
 - [RD 13] MARS – Meteorological Archive and Retrieval System, MARS User Guide (for Data Retrieval), Revision 11 – September 1995, Meteorological Bulletin B6.7/3, ECMWF Reading, England. Ref.: <http://www.wmo.ch/web/www/WDM/wdm.html>
 - [RD 14] MSG Level 1.5 Image Data Format Description. Ref.: ESA PSS-05-09 Issue 1 Rev.1
 - [RD 15] ECSS Standard on Space engineering. Verification. Ref.: ECSS-E-10-02A
 - [RD 16] ECSS Standard on Space engineering. Testing. Ref.: ECSS-E-10-03A
 - [RD 17] ECSS Standard on Space engineering. Software - Part 1: Principles and requirements. Ref.: ECSS-E-40 Part 1B
 - [RD 18] ECSS Standard on Space engineering. Software - Part 2: Document requirements definitions (DRDs). Ref.: ECSS-E-40 Part 2B
 - [RD 19] Object Management Group, Inc. (OMG), “Unified Modelling Language: Infrastructure” Version 2.0 – 05/072005
 - [RD 20] Object Management Group, Inc. (OMG), “Unified Modelling Language: Superstructure” Version 2.0 – 05/072005
 - [RD 21] Object Management Group, Inc. (OMG), “Unified Modelling Language: Diagram Interchange” Version 2.0 – 05/072005
 - [RD 22] Object Management Group, Inc. (OMG), “Unified Modelling Language: Business Modelling” Version 2.0 – 05/072005
 - [RD 23] Brown, Alan W. & Wallnau, Kurt C. "Engineering of Component-Based Systems". Component-Based Software Engineering: Selected Papers from the Software Engineering Institute. Los Alamitos, CA: IEEE Computer Society Press, 1996.
 - [RD 24] Jim Rumbaugh, Ivar Jacobson, Grady Booch. “The Unified Modelling Language Reference Manual (2nd edition)”
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2 Product Format Drivers

The H-SAF internal data format was established taken into consideration the drivers exposed in this section. Requirements are intended to bind the choice of specific data formats but not strictly the format version as much.

The adoption of format versions different from the drivers can be dictated by the use of more recent ones (e.g. BUFR ver. 4 instead of ver.3) or, on the contrary, by a not yet completed transition from previous versions.

SR-54080-FUN-DIS	Level	Component PR, SM, SP
Description	GTS disseminated products shall respond to WMO standard encoding	
Comment	Verification D	

SR-54091-FUN-DIS	Level	Component PR, SM, SP, OM
Description	Products shall be disseminated to Hydro Validation Subsystem using formats listed in Table 1	
Comment	JPEG or similar used for a quick look Verification T	



Products file format
GRIB ver. 1
GRIB ver. 2
BUFR ver. 3
HDF-5
ASCII
JPEG, PNG or similar

Table 1 Formats for data dissemination to Hydro Validation Subsystem

3 Product file name

3.1 Identification



Product SM-DAS-2 is the root zone soil wetness index obtained by ASCAT surface soil wetness (SM-OBS-1) assimilation in the ECMWF land surface assimilation system.

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It is also identified as H14 product of the H-SAF product list.

3.2 Product File name

SM-DAS-2 Data	
Description	
<p>Content: Soil wetness in the root zone, retrieved by scatterometer data assimilation method</p> <p>Repository root directory: ftp://ftp.meteoam.it/products/h14</p> <p>Namespace description</p> <ul style="list-style-type: none"> • yyyyymmddhh : year, month, day, hour <p>Demonstration data sets:</p> <ul style="list-style-type: none"> • Version 1: v1 (released in December 2010), soil moisture index in the root zone, combine ASCAT and SYNOP data, with the surface analysis code version 36r3, produced for January 2009 to August 2010 • Version 2: (June 2011), Soil moisture index in the root zone, with surface analysis code 36r4, with major improvements in the snow analysis, accounting for soil freezing in the soil moisture index computation and with improved soil moisture range in dry areas. Produced for January to December 2010. • Version 3: (November 2011), Liquid soil moisture index in the root zone, with surface analysis code 36r4, with major improvements in the snow analysis, accounting for soil freezing in the soil moisture index computation and with improved soil moisture range in dry areas. Produced for January to December 2010. http://www.ecmwf.int/research/EUMETSAT_projects/SAF/HSAF/ecmwf-hsaf/SM-DAS-2/h14_demodata_v3.tar.gz • Version 4: January 2012, Same as version 3, but fully compliant with the final SM-DAS-2 data output format: <ul style="list-style-type: none"> ○ uses GRIB Identification parameters specifically defined for the H-SAF SM-DAS-2 product, as indicated in Section 5.3.2 below. ○ Uses final file name convention defined below http://www.ecmwf.int/research/EUMETSAT_projects/SAF/HSAF/ecmwf-hsaf/SM-DAS-2/h14_demodata_v4.tar.gz <p>Previews: http://www.ecmwf.int/research/EUMETSAT_projects/SAF/HSAF/ecmwf-hsaf/SM-DAS-2/h14_demodata_previews_v4.tar.gz</p> <p>Suffix for Digital Data: “grib” (GRIB1 file) Suffix for Image Data: “png” (image data file)</p> 	
SM-DAS-2 Digital Data	
Sub-repository	/h14_cur_mon_buf (data of current month)
File name	h14_yyyyymmddhh.grib
SM-DAS-2 Image Data	

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Sub-repository	/h14_cur_mon_png (data of current month)
File name	h14_yyyymmddhh.1.png, h14_yyyymmddhh.2.png, h14_yyyymmddhh.3.png, h14_yyyymmddhh.4.png

4 Input Data Formats

Data content	Data provider	Media	Data Format	Involved components
ASCAT surface wetness (SM-OBS-1)	EUMETSAT	EUMETCAST	BUFR	SM
SYNOP screen level parameters and snow depth	WMO	GTS	SYNOP report	T2m, Rh2m, SD
NOAA/NESDIS IMS snow cover area	NOAA	GTS	ASCII	SC

5 H-SAF Internal Data Format Definition

5.1 Product Type Metadata Table

In this table the following naming convention applies:

{METOP} = 'M01', 'M02', 'M03'

Product	Acronym	Identifier	Product Type	Satellite ID	Orbit Type	Instrument ID	Processing Level	Granule Type
			APNM	ASTI	GORT	AIID	GPLV	GGTP
Soil wetness index in the root zone retrieved by data assimilation method	SM-DAS-2	H14	SM	ASCAT	POLAR	METOP	04	

5.2 Covered Areas

Product	Acronym	Identifier	Covered area
Soil wetness index in the root zone retrieved by data assimilation method	SM-DAS-2	H14	Global product available for latitudes from -89.827S to 89.827N, and for longitudes between 0 and 359.775E, on land surfaces.

5.3 Product metadata

Size of the attribute can be:



- 1 as general case: a single unit attribute
- “N” value, in case of String attribute: N is the amount of characters composing the string
- “NxM” value in case of grid attribute (e.g. LAT and LON).

5.3.1 Metadata group

H-SAF Attribute name	UMARF short name	Type	Size	Description
Title	APNA	String	34	Message1: “Soil wetness index in layer 1 swi1” Message2: “Soil wetness index in layer 2 swi2” Message3: “Soil wetness index in layer 3 swi3” Message4: “Soil wetness index in layer 4 swi4”
Nominal Date and time		String	10	“yyyymmddhh”
Producer		String	10	HSAF_ECMWF”
Version		String	5	Product Version
Production Mode	GPMD	String	12	“Nominal”

5.3.2 Product Specific Metadata group

H-SAF Attribute name	UMARF short name	Type	Size	Description
table2Version		Real	3	228
indicatorOfParameter Meassages 1,2,3,4		real	2	40, 41, 42, 43
missingValue		Real	4	9999
bitsPerValue		Real	2	24
editionNumber		Real	1	1
indicatorOfTypeOfLevel		Real	1	1
numberOfValues		Real	6	“Number of values”
gridType		String	10	“reduced_gg”

 	Data Output Format – DOF-2 (Product PR-OBS-2)	Doc. No: SAF/HSAF/DOF/2.0 Issue: Version 2.3 Date: 16/05/2011 Page: 13/20
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5.3.3 Geolocation group

H-SAF Attribute name	UMARF short name	Type	Size	Description
latitudeOfFirstGridPointInDegrees		Real	6	89.827
longitudeOfFirstGridPointInDegrees		Real	1	0
latitudeOfLastGridPointInDegrees		Real	7	-89.827
longitudeOfLastGridPointInDegrees		Real	7	359.775
dataDate		string	8	“yyyymmdd”
dataTime		string	1	“hh”
numberOfDataPoints		Real	6	“Number of grid points” (843490)

6 Product Dissemination Formats Definition

Product	Dissemination Formats	Dissemination media	Source	Destination
SM-DAS-2	Values in grid points on a reduced Gaussian grid at T799 in GRIB-1	ftp	SM-DAS-2	ZAMG

7 TBDs/TBCs list

No TBDs/TBCs are pending

8 Glossary

AAPP	AVHRR and ATOVS Processing Package
ADEOS	Advanced Earth Observation Satellite (I and II)
ALOS	Advanced Land Observing Satellite
AMIR	Advanced Microwave Imaging Radiometer
AMSR	Advanced Microwave Scanning Radiometer (on ADEOS-II)
AMSR-E	Advanced Microwave Scanning Radiometer - E (on EOS-Aqua)
AMSU-A	Advanced Microwave Sounding Unit - A (on NOAA satellites and EOS-Aqua)
AMSU-B	Advanced Microwave Sounding Unit - B (on NOAA satellites up to NOAA-17)
API	Application Program(ming) Interface
ASAR	Advanced SAR (on ENVISAT)
ASCAT	Advanced Scatterometer (on MetOp)
ASI	Agenzia Spaziale Italiana
ATDD	Algorithms Theoretical Definition Document
ATMS	Advanced Technology Microwave Sounder (on NPP and NPOESS)
ATOVS	Advanced TIROS Operational Vertical Sounder (on NOAA and MetOp)
AU	Anatolian University
AVHRR	Advanced Very High Resolution Radiometer (on NOAA and MetOp)
BAMPR	Bayesian Algorithm for Microwave Precipitation Retrieval
BfG	Bundesanstalt für Gewässerkunde
BRDF	Bi-directional Reflectance Distribution Function
BVA	Boundary Value Analysis
CASE	Computer Aided System Engineering
CBA	Component-Based Architecture
CBSD	Component-based Software Development
CDA	Command and Data Acquisition (EUMETSAT station at Svalbard)
CDD	Component Design Document
CDR	Critical Design Review
CESBIO	Centre d'Etudes Spatiales de la BIOSphere (of CNRS)
CETP	Centre d'études des Environnements Terrestres et Planétaires (of CNRS)
CI	Configuration Item
CMIS	Conical-scanning Microwave Imager/Sounder (on NPOESS)
CMP	Configuration Management Plan

CNMCA	Centro Nazionale di Meteorologia e Climatologia Aeronautica
CNR	Consiglio Nazionale delle Ricerche
CNRM	Centre Nationale de la Recherche Météorologique (of Météo-France)
CNRS	Centre Nationale de la Recherche Scientifique
COM	Component Object Model
CORBA	Common Object Request Broker Architecture
COTS	Commercial-off-the-shelf
CPU	Central Processing Unit
CR	Component Requirement
CRD	Component Requirement Document
CVERF	Component Verification File
CVS	Concurrent Versions System
DCOM	Distributed Component Object Model
DEM	Digital Elevation Model
DFD	Data Flow Diagram
DMSP	Defense Meteorological Satellite Program
DOF	Data Output Format
DPC	Dipartimento della Protezione Civile
DWD	Deutscher Wetterdienst
E&T	Education and Training
EARS	EUMETSAT Advanced Retransmission Service (station)
ECMWF	European Centre for Medium-range Weather Forecasts
ECSS	European Cooperation on Space Standardization
EGPM	European contribution to the GPM mission
EOS	Earth Observing System
EPS	EUMETSAT Polar System
ERS	European Remote-sensing Satellite (1 and 2)
ESA	European Space Agency
EUR	End-User Requirements
FMI	Finnish Meteorological Institute
FOC	Full Operational Chain
FTP	File Transfer Protocol
GEO	Geostationary Earth Orbit
GIS	Geographical Information System
GMES	Global Monitoring for Environment and Security
GOMAS	Geostationary Observatory for Microwave Atmospheric Sounding
GOS	Global Observing System
GPM	Global Precipitation Measurement mission
GPROF	Goddard Profiling algorithm

GTS	Global Telecommunication System
GUI	Graphical User Interface
HMS	Hungarian Meteorological Service
HRU	Hydrological Response Unit
H-SAF	SAF on support to Operational Hydrology and Water Management
HSB	Humidity Sounder for Brazil (on EOS-Aqua)
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
HUT/LST	Helsinki University of Technology / Laboratory of Space Technology
HV	Hydrovalidation (referred to Hydro Validation Subsystem items, e.g.: reports, components etc.)
HVR	Hydrological Validation Review
HYDRO	Preliminary results of Hydrological validation
HYDROS	Hydrosphere State Mission
HW	Hardware
ICD	Interface Control Document
ICT	Information and Communication Technology
IEEE	Institute of Electrical and Electronics Engineers
IFS	Integrated Forecast System
INF	Progress reports in between meetings
INWM	Institute of Meteorology and Water Management (of Poland)
IPF	Institut für Photogrammetrie und Fernerkundung
ISAC	Istituto di Scienze dell'Atmosfera e del Clima (of CNR)
ISO	International Standards Organization
IT	Information Technology
ITU	Istanbul Technical University
JPS	Joint Polar System (MetOp + NOAA/NPOESS)
J2EE	Java 2 Enterprise Edition
KIDS	Kestrel Interactive Development System
KLOC	Thousand (Kilo) Lines Of Code
KOM	Kick-Off Meeting
LAI	Leaf Area Index
LAN	Local Area Network
LEO	Low Earth Orbit
LIS	Lightning Imaging Sensor (on TRMM)
LLS	Lower Level Specifications
LOC	Lines Of Code
LST	Solar Local Time (of a sun-synchronous satellite)
MARS	Meteorological Archive and Retrieval System
MetOp	Meteorological Operational satellite

METU	Middle East Technical University (of Turkey)
MHS	Microwave Humidity Sounder (on NOAA N/N' and MetOp)
MIMR	Multi-frequency Imaging Microwave Radiometer
MIN	Minutes of Meetings/Reviews
MODIS	Moderate-resolution Imaging Spectro-radiometer (on EOS Terra and Aqua)
MSG	Meteosat Second Generation
MTBF	Mean Time Between Failure
MTG	Meteosat Third Generation
MTTR	Mean Time To Repair
MVIRI	Meteosat Visible Infra-Red Imager (on Meteosat 1 to 7)
N/A	Not Available
N.A.	Not Applicable
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organisation
NDI	Non-developmental Items
NIMH	National Institute for Meteorology and Hydrology (of Hungary)
NMS	National Meteorological Service
NOAA	National Oceanic and Atmospheric Organisation (intended as a satellite series)
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NPP	NPOESS Preparatory Programme
NRT	Near-Real Time
NWP	Numerical Weather Prediction
OAR	Options Analysis for Reengineering
OFL	Off-line
OM	Offline Monitoring (referred to Offline Monitoring Subsystem items, e.g.: components)
OMG	Object Management Group
OO	Object Oriented
OP	Proposal for H-SAF Operational phase
OPS	Operational Product Segment
ORB	Object Request Broker
ORR	Operations Readiness Review
OWL	Web Ontology Language
PAC	Prototype Algorithm Code
PALSAR	Phased Array L-band Synthetic Aperture Radar (on ALOS)
PAW	Plant Available Water
PDR	Preliminary Design Review
POP	Precipitation Observation Production
PP	Project Plan
PPR	Products Prototyping Reports

PR	Precipitation (referred to Precipitation Subsystem items, e.g.: products, components etc.)
PRB	Problem Review Board
QoS	Quality of Service
R&D	Research and Development
RCS	Revision Control System
REP	Report
RMI	Royal Meteorological Institute (of Belgium)
RR	Requirements Review
RT	Real Time
SAAM	Simulation, Analysis and Modeling
SAF	Satellite Application Facility
SAG	Science Advisory Group
SAOCOM	Argentinean Satellite for Observation and Communication
SAR	Synthetic Aperture Radar
SA/SD	Structured Analysis / Structured Design
SCA	Snow Covered Area
SCAT	Scatterometer (on ERS-1 and 2)
SCM	Source Configuration Management
SD	Snow depth
SDAS	Surface Data Assimilation System
SDD	System Design Document
SDP	Software Development Plan
SEI	Software Engineering Institute
SEVIRI	Spinning Enhanced Visible Infra-Red Imager (on MSG)
SHW	State Hydraulic Works of Turkey
SHFWG	SAF Hydrology Framework Working Group
SHMI	Slovakian Hydrological and Meteorological Institute
SIRR	System Integration Readiness Review
SIVVP	System Integration, Verification & Validation Plan
SLAs	Service-Level Agreements
SM	Soil Moisture (referred to Soil Moisture Subsystem items, e.g.: products, components etc.)
SMART	Service Migration and Reuse Technique
SMMR	Scanning Multichannel Microwave Radiometer (on SeaSat and Nimbus VII)
SMOS	Soil Moisture and Ocean Salinity
SN	Snow Parameters (referred to Snow Parameters Subsystem products)
SOA	Service-Oriented Architecture
SoS	System of Systems
SP	Snow Parameters (referred to Snow Parameters Subsystem items, e.g.: components)
SQL	Structured Query Language

SR	System Requirement
SRD	System Requirements Document
SSM/I	Special Sensor Microwave / Imager (on DMSP up to F-15)
SSMIS	Special Sensor Microwave Imager/Sounder (on DMSP starting with F-16)
SSVD	System/Software Version Document
STRR	System Test Results Review
SVALF	System Validation File
SVERF	System Verification File
SVRR	System Validation Results Review
SW	Software
SWE	Snow Water Equivalent
SYKE	Finnish Environment Institute
TBC	To be confirmed
TBD	To be defined
TC	Test Case
TKK/LST	Helsinki University of Technology / Laboratory of Space Technology
TLE	Two-line-element (telemetry data format)
TMI	TRMM Microwave Imager (on TRMM)
TP	Test Procedure
TR	Test Report
TRMM	Tropical Rainfall Measuring Mission
TSMS	Turkish State Meteorological Service
TU Wien	Technische Universität Wien
UM	User Manual
U-MARF	Unified Meteorological Archive and Retrieval Facility
UML	Unified Modelling Language
UR	User Requirement
URD	User Requirements Document
VIIRS	Visible/Infrared Imager Radiometer Suite (on NPP and NPOESS)
VS	Visiting Scientist
WBS	Work Breakdown Structure
WMO	World Meteorological Organization
WP	Work Package
WPD	Work Package Description
WS	Workshop
XMI	XML (eXtensible Markup Language) Metadata Interchange
XML	eXtensible Markup Language
ZAMG	Zentral Anstalt für Meteorologie und Geodynamik

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