

## Federated Activity

H-SAF\_CM\_NWC\_ROM\_CF\_FA14\_02

### SAF Network Joint Precipitation Working group Activities

#### Final report

H-SAF\_CM\_NWC\_ROM\_CF\_FA14\_02

<b>FA title</b>	SAF Network Joint Precipitation Working group Activities		
<b>FA participating organizations</b>	H-SAF, CM-SAF, NWC-SAF, ROM-SAF, CF EUMETSAT		
<b>FA proposal ID:</b>	HSAF_FA14_02	<b>Objectives summary</b>	Discuss and coordinate SAF precipitation-related items
<b>FA leading institute:</b>	H-SAF ISAC-CNR Rome	<b>Related SAF products:</b>	Precipitation Cluster Products
<b>FA Leader</b>	Stefano Dietrich (ISAC-CNR Rome)	<b>Related SAF WP:</b>	
<b>Expected start date:</b>	Q4 2014 (November, 2014)	<b>Related SAF (review) processes:</b>	
<b>Expected end date:</b>	Q1-2017 (February 2017)	<b>FA costs:</b>	No Cost

#### Document Approval Table

	Name	Function	Date
Prepared by:	Stefano Dietrich	FA Leader	5 September 2018
Reviewed by:			
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Approved by:			

#### Document Change Record

Issue/Revision	Date	DCN. No	Summary of Changes
V 1.0	05/09/2018		

This Federated Activity (FA) scope has been to support the activities of the Joint Precipitation Working Group (JPWG):

- to provide a body where common strategies and concepts are discussed and agreed among the participants;
- to launch cooperative activities on actual algorithms and products between the participating SAFs and to encourage data and product exchanges;
- to devise plans for cooperative work on future algorithms and products dwelling on the new satellites and sensors;
- to examine validation procedures and to facilitate the access to extensive ground truth datasets;
- to identify precipitation-related recommendations to EUMETSAT decision bodies (SAF Steering Groups, Science Working Group, SAGs,...).

The No-Cost H-SAF\_CM\_NWC\_ROM\_CF\_FA14\_02, started in CDOP2 to better harmonize the precipitation efforts in different SAFs, has been interrupted due to the lack of agreement among the participants mainly on the Joint Product Validation strategies and related efforts.

## **Summary**

The FA was approved by e-mail on 7 November 2014 to support the activities of the Joint Precipitation Working Group (JPWG), established as a EUMETSAT group on 22 March, 2013 in Darmstadt.

Tele-connection contacts among participants were organized since January 2015, while the 1st Joint Precipitation Working Group (JPWG) meeting was arranged in EUMETSAT HQ on 20 May 2015.

At that time one of the main purposes was the attempt to harmonize the catalog of precipitation products proposed by SAFs for the CDOP3 phase. Therefore the initial quick algorithm survey was followed by the attempt to organize a “EUMETSAT precipitation observation concept” (activity led by CF) able to provide guidelines in classifying present and future precipitation products delivered by SAFs.

Unfortunately, due to the pressing schedule of the activity of each participating SAF in that period, the precipitation concept document did not pass the draft form. Nevertheless, it positively influenced the structure of CDOP3 precipitation products, i.e. the H SAF catalog.

The preparation of CDOP3 proposal monopolized the interest of participants and most of planned initiatives, drafted in the annexed minutes, were postponed.

Different points of view on how performing common validation have further complicated the interactions until the end of CDOP2. In the meantime the PMs did not fully cooperate in order to include this FA also in CDOP3. The result was that this FA automatically expired at the end of CDOP2, even if it remains cited as backlog in CDOP3 SG meetings.

Further discussion on a EUMETSAT Strategy for precipitation related products and activities are expected to be conducted under the leadership of the EUMETSAT Secretariat, involving the SAFs as appropriate.

## Annex 1

### **Minutes from the 1<sup>st</sup> Joint Precipitation Working Group (JPWG) meeting 20th May 2015 - EUMETSAT HQ**

#### **List of participants:**

<b>Attendee</b>	<b>Affiliation</b>
Juan Manuel Sancho	AEMET(NWCSAF)
Cecilia Marcos	AEMET(NWCSAF)
Pilar Rípodas	AEMET (NWCSAF)
Anke Thoss	SMHI (NWCSAF)
Stefano Dietrich	ISAC CNR (H-SAF)
Giulia Panegrossi	ISAC CNR (H-SAF)
Davide Melfi	CNMCA (H-SAF)
Hollmann Rainer	DWD (CM-SAF)
Axel Andersson	DWD (CM-SAF)
C. Accadia	EUMETSAT
V. Mattioli	EUMETSAT
X. Calbet	EUMETSAT
J. Grandell	EUMETSAT

## Agenda

<b>09:00</b>	Welcome and introduction	C. Accadia, S. Dietrich
<b>09:30</b>	NWC SAF plans and proposals and vision for an overall EUMETSAT precipitation concept	P. Rípodas (AEMET), A. Thoss (SMHI)
<b>10:00</b>	CM SAF plans and proposals and vision for an overall EUMETSAT precipitation concept	R. Hollmann (DWD)
<b>10:30</b>	H-SAF plans and proposals and vision for an overall EUMETSAT precipitation concept	D. Melfi (CNMCA), G. Panegrossi (CNR-ISAC)
<b>11:00</b>	ROM SAF plans and proposals and vision for an overall EUMETSAT precipitation concept	C. Accadia on behalf of ROM-SAF
<b>11:15</b>	EUMETSAT Secretariat activities	J. Grandell (EUMETSAT)
<b>11:45</b>	Lunch	
<b>13:00</b>	Consolidation of the EUMETSAT precipitation concept	All
<b>15:30</b>	Wrap-up	C. Accadia, S. Dietrich
<b>16:15</b>	Adjourn	

During the meeting the participants addressed its high level objectives of the JPWG and this document resumes the main outcomes from discussions occurred during this JPWG meeting. All meeting presentations are presently available at:

<https://www.dropbox.com/sh/9i42nwtgc1kdkvu/AAAYB7I8MjR4bLM5LUevmfcVa?dl=0>

However, JPWG documents, presentations and minutes will be shared soon using a different restricted space.

### **A0) C. Accadia, S. Dietrich: Re-locate the JPWG documents repository**

This meeting report is organized following the high-level objectives listed in the JPWG Terms of Reference document and in the JPWG Federated Activity document and are reminded here:

*The Federated Activity (FA) scope is to support the activities of the Joint Precipitation Working Group (JPWG). Within this overarching frame the following high-level objectives are identified:*

1. to provide a body where common strategies and concepts are discussed and agreed among the participants;

2. to launch cooperative activities on actual algorithms and products between the participating SAFs and to encourage data and product exchanges;
3. to devise plans for cooperative work on future algorithms and products dwelling on the (new) satellites and sensors;
4. to examine validation procedures and to facilitate the access to extensive ground truth datasets;
5. to identify precipitation-related recommendations to EUMETSAT decision bodies (SAF Steering Groups, Science Working Group, SAGs,...).

**1**      *DEVISE PLANS FOR COOPERATIVE WORK ON FUTURE ALGORITHMS AND PRODUCTS DWELLING ON THE (NEW) SATELLITES AND SENSORS;*

- a) All participating SAF's and the Secretariat provided an overview of existing products, software and algorithms and their plans for CDOP 3 (in case of SAF's) and EPS SG (in case of the Secretariat). The details are given in the presentation, however important major changes are summarized here
  1. NWC SAF announced the discontinuation of the precipitation related products from the PPS software
  2. CM SAF is going to provide in CDOP 3 also a dedicated global precipitation climate data record
  3. H SAF is going to provide in CDOP 3 day-1 global precipitation products from MWS and MWI
  4. Secretariat announced the discontinuation of the MPE related to the operational provision of the HSAF blending product over the corresponding geographic areas (double disc)
- b) In preparation of this meeting a survey among all SAF's and the secretariat was conducted. Until now, the survey is not complete yet. NWC SAF, CM SAF and H SAF have already provided, for most of their precipitation algorithms, the summary sheets containing the relevant characteristics of each algorithm, expressed in an agreed comparable scheme. It is important to have all the precipitation algorithms summarized in that format, in order to produce meaningful and well-organized survey reports, starting from next JPWG meeting.

The depository is presently (but see A0) at:

<https://www.dropbox.com/sh/ih9hqre3crxbakl/AADnOdCQL5OAFc1k8kLhqMIYa?dl=0>

**A1) All: Check and update the survey summary sheets**

- c) ROM SAF is still far from having operational precipitation products. There are some research topics that could be discussed with SAF partners.

**R1) JPWG recommends to ROM-SAF to consider the Visiting Scientist instrument to explore the research ideas regarding precipitation.**

- d) *Common planning in view of future products and activities, e.g., MTG and EPS-SG.*

**- Current plans for EPS-SG products**

- a. CM SAF has provided to the Secretariat an ATBD for the day-1 liquid water path product from MWI. CM SAF will not be the implementer of this day-1 product.
- b. NWC SAF will propose to work on day-1 ice water path product from ICI. Both products will be generated at EUMETSAT central facilities.
- c. H SAF will propose to work on day-1 precipitation products (from MWS, MWI and combined MWI/ICI)
- d. The software requirements for the eventual dissemination of these products within the NWC SAF PPS software will be discussed in CDOP-3.
- e. NWC SAF aims to deliver day-one software for an ICI ice water path product, and for an MWI-ICI precipitation product. Collaboration with H SAF and/or CM SAF is sought also depending from inter comparison exercises
- f. Discussion is open on the combined product MWI+ICI precipitation products since they could benefit from a cooperative effort between H SAF and NWC SAF. NWC SAF / SMHI remarks that a release of combined products is more realistic as day-2 products within CDOP4 timeframe.
- g. Since most of cooperative activities will involve EPS-SG, the following action is addressed:

**A2) S. Dietrich: activate a specific EPS-SG Discussion Group by organizing an initial teleconference**

A more consolidated common vision and planning of EPS-SG SAFs precipitation products will derive from the A2) and will be formalized during next JPWG meeting

Align/common planning and actions on current algorithms and products.

- a) NWC SAF would like to include some MW precipitation algorithms in the PPS NWCSAF software. Preliminary discussions indicated that both H SAF and CM SAF could provide algorithms. Both H SAF and CM SAF are available to investigate with NWC SAF whether and how to make available selected precipitation algorithms for inclusion into the NWC SAF PPS software. The interest however is focused on post EPS algorithms (see A2), so this discussion can be postponed to the CDOP-3 time frame when some inter-comparison exercises will be planned.

**A3) NWC SAF: report advancements on the plans about the inclusion of MW precipitation algorithms in PPS tool (next JPWG meeting)**

- b) Regarding NWC SAF GEO package for precipitation retrieval (IR/VIS and LI sensor), only data from GEO platforms are used currently. An inclusion of MW LEO data is not currently foreseen and a migration of MW/IR H SAF products would be a technical issue. The extra manpower required for this task is not available at the moment. Nevertheless, NWC SAF considers that before such a drastic change of the GEO NWC SAF package, the benefits of it should be clearly demonstrated. Also the possible problems that users could have due to that change should be evaluated and considered before any decision is taken in this direction. In any case, NWC SAF proposes an extensive and systematic comparison of the IR/VIS sensor NWC/GEO products and the MW/IR H SAF products to investigate strengths and weakness of the algorithms of both groups of products. This would be a good starting point for a possible merging/improvement of the current algorithms. However, GEO NWC SAF developers are interested in a scientific exchange with H-SAF in order to define future developments.

**A4) NWC SAF: report advancements on the planned role of MW data in GEO NWC SAF package (next JPWG meeting)**

- c) CM SAF will work in CDOP-3 on Climate Data Records (CDR) including also precipitation over land. For the production of this CM SAF will rely on the conical scanning sensors (e.g. SSM/I, TMI, GMI) in combination with IR data from all geostationary satellites complemented by a mid- and high-latitude component of cross track scanners. It is suggested to explore the possibility to generate an AMSU/MHS (cross-track) CDR from H SAF cross track algorithms.

**A5) CM SAF: discuss with H SAF the feasibility using H SAF developed AMSU/MHS algorithms for the planned global precipitation CDR and report decisions (next JPWG meeting)**

### 3 TO EXAMINE VALIDATION PROCEDURES AND TO FACILITATE THE ACCESS TO EXTENSIVE GROUND TRUTH DATASETS

#### a. Reference data collection

The policy of the H SAF ground validation (GV) cluster at present does not include sharing/provision of validation datasets. Each member country works on its ground (radar and rain gauges) precipitation data by running a “common code” to produce validation results and statistics for H SAF precipitation products and case studies analysis.

CM SAF could share ship-based precipitation measurements to validate precipitation algorithms over sea. In addition, GPM DPR products could represent a benchmark for assessing real time instantaneous behaviour, once DPR product algorithms will be consolidated.

#### b. Validation/verification methods

SAFs are presently following different strategies for validating precipitation products. The different approaches are motivated by the different information needed by the end-users of the SAFs. As a matter of fact an object-oriented approach is considered significant in NWC SAF to assess the real time algorithms performance, while pixel-based verification techniques are requested and implemented in H SAF following the requirements of the hydrology community.

As far as CM SAF is concerned, for precipitation climate data records in addition an assessment/validation of e.g. homogeneity, consistency and stability is needed.

A cross-validation could be useful to understand if algorithms/products provided in each SAF could be useful if provided also to different user communities. Even if the appointment of one or more Visiting Scientists could be useful for short-term comparison needs, it would be useful to have the opportunity to merge the validation/verification activity of the precipitation products on a more regular basis.

AEMET proposed that in order to define a strategy for future algorithms a comparison of precipitation products using a common method and a common reference dataset would be advantageous detecting strengths and weakness of the algorithms under consideration.

For H SAF, Ground Validation activities are already a significant, structured and consolidated part and are also connected to NASA GPM through a FA.

Strategies and tools for the validation of satellite precipitation products available from global precipitation communities such as IPWG and GPM will be also examined and taken into account in this framework.

**R2) JPWG recommends intensifying the contacts among H SAF validation group, AEMET, and people interested in validation from other SAFs.**

**A6) ALL JPWG members: indicate validation datasets that can be shared and used by all SAFs, propose validation and inter comparison exercises**

**A7) S. Dietrich: activate a specific validation/intercomparison (VIC) Discussion Group by organizing an initial teleconference**



4 *IDENTIFY PRECIPITATION-RELATED RECOMMENDATIONS TO EUMETSAT DECISION BODIES (SAF STEERING GROUPS, SCIENCE WORKING GROUP, SAGS,...).*

a) Overall EUMETSAT concept for precipitation

In order to progress on the objective to provide a synoptic, coordinated and organic view of the precipitation activities in EUMETSAT, the JPWG started to draft an overall EUMETSAT concept for precipitation. For this, two documents have been circulated prior to the meeting.

The first document details the existing capabilities, existing implementation and products of EUMETSAT w.r.t. to precipitation (doc ref #1), whereas the 2<sup>nd</sup> one provides a draft general vision (doc ref #2).

During the meeting the content and scope of both documents have been discussed in more detail leading to the decision that JPWG will follow a two-step approach by formulating first a draft overall vision (based on doc ref#2) which is driven by the needs of Member states for different application areas. This document shall then be used as reference document for the coordination of related CDOP-3 activities.

The detailed implementation will be maintained in the 2<sup>nd</sup> part of the document, based on the overall vision. For this 2<sup>nd</sup> part, the JPWG agreed on an application oriented view of the existing activities and to delete Annex A. The detailed implementation plan was seen to be a subject for discussion for upcoming meetings of JPWG.

**R3) The JPWG recommend that the document “Overall EUMETSAT precipitation concept” shall be added and used as reference document for the upcoming proposals for CDOP-3 of the Satellite Application Facilities (SAFs).**

**A8) Christophe Accadia: to provide an update document reflecting the changes requested**

**A9) Christophe Accadia: to check for NWP specific requirements on precipitation (e.g.in EPS SG URD)**

**A10) All: Provide contribution and/or comments to the “Overall EUMETSAT precipitation concept” document (H SAF: Hydrology, CM SAF: climate, NWC SAF: Weather Forecasting and nowcasting)**

b) MW-IR real time precipitation monitoring

Grandell, during his presentation, reported that the MPE product, presently still distributed operationally by CAF over both the discs observed by European geostationary satellites, is suffering from the lack of MW precipitation input (only F16 is used). MPE could be discontinued as soon as the full disc H SAF blending product will be extended to cover also Indian Ocean (the second disc) since both the algorithms are based on the same concept.

**R2) JPWG recommends examining the possibility to have a double disc (corresponding to the view of the two geostationary European satellites) covered with real time precipitation products (IR/MW blending technique).**

**A11) H SAF / Secretariat: evaluate to include/add this option in the CDOP-3 proposal**

c) Text and context needed

**R5) JPWG confirmed that precipitation rate product derived from EPS-SG METimage as included in the ESP-SG URD?is not further needed.**



## **EUMETSAT Joint Precipitation Working Group**

### **Terms of Reference**

The Joint Precipitation Working Group (JPWG) was established as a EUMETSAT group on 22 March, 2013 in Darmstadt. It aims at focusing all EUMETSAT activities in the field of satellite precipitation estimation from space by providing a forum to exchange information and devise strategies for common research and operational tasks within the SAF network and EUMETSAT Central Facilities (CF).

#### **Purpose**

The JPWG intends to build upon the expertise of the SAF scientists working on clouds and precipitation property retrievals and measurements from satellite to ensure a high degree of coordination and collaboration among the involved SAFs and the CF. The JPWG is established to:

- facilitate the exchange of data, products and algorithms between the SAFs;
- help devising common algorithms and product development strategies;
- contribute to that the overall set of requirements on EUMETSAT precipitation products are met through coordinated planning development efforts;
- discuss, prepare and plan joint commitments;
- share validation datasets and strategies for improving the validation procedures;
- share validation methods.

#### **Objectives**

The objectives of the JPWG are to coordinate the precipitation-related activities in EUMETSAT's application ground segment. In particular:

- to provide a body where common strategies and concepts are discussed and agreed among the participants;
- to launch cooperative activities on actual algorithms and products between the participating SAFs and to encourage data and product exchanges;
- to devise plans for cooperative work on future algorithms and products dwelling on the new satellites and sensors;
- to examine validation procedures and to facilitate the access to extensive ground truth datasets;
- to identify precipitation-related recommendations to EUMETSAT decision bodies (SAF Steering Groups, Science Working Group, SAGs,...).

## **Membership**

The group composition is representatives of SAFs whose activities are related to precipitation and EUMETSAT Central Facilities.

The current participating entities are:

- CM-SAF – Satellite Application Facility on Climate Monitoring;
- H-SAF – Satellite Application Facility on Support to Operational Hydrology and Water Management;
- NWC-SAF – Satellite Application Facility on Support to Nowcasting and Very Short Range Forecasting.
- ROM-SAF – Satellite Application facility on Radio Occultation Meteorology.
- CF – EUMETSAT Central Facilities.

The SAF Network Management Team and the EUMETSAT Secretariat are integral part of the body.

The JPWG members are nominated by the participating SAFs and by the SAF Network Management Team.

## **Working Arrangements**

The JPWG is chaired by two Co-Chairpersons, one from the SAF network and one from EUMETSAT. The two co-chairs shall:

- compile reports on the activities of the group;
- prepare the meetings;
- propose items for discussion and interaction with the JPWG members;
- convey relevant recommendations from JPWG to SAF Steering Groups and EUMETSAT decision bodies.

Each member of the JPWG has the right and is encouraged to advance proposals on the JPWG activities and to bring in specific issues eventually discussed within the SAFs and EUMETSAT.

The JPWG meets on an irregular basis and tries to carry on most of its work via e-mail and telecon/videocon.