





H SAF Precipitation Products Quality Assessment: methodology and results

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H SAF project

Precipitation Product Validation Group (PPVG)

Outline

- Operational precipitation products
- Methodologies & Reference precipitation data
 - Results and Case studies
- Future perspectives
- Conclusions



Objectives:

- Provide new satellite-derived products to satisfy the needs of operational hydrology:
 - Soil moisture, Precipitation and Snow parameters products;
- Perform independent validation;
- Assess the impact of the products on hydrological applications







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H SAF project

EUMETSAT HSAF Precipitation Product Validation Group (PPVG)

The *Precipitation Product Validation Group* (**PPVG**) is composed of experts from the National Meteorological and Hydrological Institutes of **8 European countries**. The PPVG uses ground data for quality assessment of precipitation products, following the same methodology.

Country	Institutes	
Belgium 🛝	RMI	
Bulgaria 👞	NIMH	
Germany 📉	BfG	
Hungary 🚞	OMSZ	
Italy 🐘	DPC, CNR-ISAC	
Poland 🛛 🗮	IMWM	
Slovakia 🐘	SHMU	
Turkey 🔯	ITU, METU,TSMS	



Operational precitation products

H60 (P-IN-SEVIRI-PMW) and H63 (P-IN-SEVIRI_E) products



EUMETSAT H SAF P-IN-SEVIRI-PMW (H60) Instantaneous rain rate retrieved from IR-MW blending data C H SAF Blending of SEVIRI IR + MW LEO Satellites 20240708_0000

FUMETSAT



Main features				
Coverage	MSG Full- disk area			
Cycle	15 minutes			
Spatial Resolution	3 Km s.s.p. ~8 km over Europe			
Timeliness	Within 5 minutes from the end of acquisition			
Dissemination	EUMETCast and HSAF			
Formats	NetCDF			

Instantaneous precipitation rate at ground every 15 minutes



H61 (P-AC-SEVIRI-PMW) and H90 (P-AC-SEVIRI_E) products



EUMETSAT H SAF P-AC-SEVIRI-PMW (H61) Accumulated precipitation at ground by blended MW and IR h61_20240708_0100_01_fdk



						> mm
0	5	10	15	20	25	30
GM7	2024 Jul 08 01:15	:44 Production	SATELLITE	AREA COMET A	aorithm COMET	GELMETSAT



H64 (P-AC-SM2RAIN) product







Accumulated precipitation at ground (daily)

Precipitation/Soil Moisture integrated product



H68 (P-IN-PMW) product



EUMETSAT H SAF P-IN-PMW (H68 prel.) Precipitation rate estimation over 30 minutes Based on intercalibrated PMW precip.rate estimates h68_20240708_00000_002959_hea



Main features			
Coverage	MSG Full- disk area		
Cycle	1/2 hour		
Spatial Resolution	0.25°		
Timeliness	4h		
Dissemination	EUMETCast and HSAF		
Formats	NetCDF		

Instantaneous precipitatation rate every 30 minutes

Gridded MW instantaneous precipitation rate based on intercalibrated PMW instantaneous precipitation rate estimates on extended H SAF area

QA Methodologies and Reference data





2 chanter

European ground data



TOTAL



More than 8,000 rain gauges

Country	Total number of gauges	Average minimum distance (km)
Belgium	92	15.2
Bulgaria	123	25.2
Germany	2299	12.9
Hungary	270	17.0
Italy	2934	11.3
Poland	540	24.0
Slovakia	911	13.6
Turkey	1235	26.5
TOTAL	8404	

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163

190

141

186

137

253











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H61 Triple Collocation results







Case studies

EUMETS Extreme event monitoring - Storm Daniel September 2023



https://user.eumetsat.int/resources/case-studies/extreme-floods-in-libya-and-central-greece

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EUMETSATE XTREME event monitoring - Nigeria Flood October 2022

Transport affected for 2+ weeks

Flooding in 26 out 36 Nigerian states

600+ casualties





H SAF satellite soil moisture and precipitation anomalies are computed for September 2022, with positive values in the northern part of Nigeria and in Burkina Faso



Future perspectives





What objective?

To develop an automatic NRT comparison web-platform able to check the quality of data and products, with results available at different levels of detail (temporal: monthly, daily, single acquisition; and spatial: fulldisk, Europe, restricted area)

Which products?

H SAF products ✓ H60 and H63 (15') ✓ H61 and H90 (1h +) ✓ H64 (daily) ✓ H68 (30')



Ground data

- ✓ IT mosaic radar (5' +)
- ✓ IT raingauges (1h +)
- ✓ EU OPERA radar (15' +)
- EU raingauges (1h +)
- Global raingauges

and much more ...



suggestions for which products to compare!

What methodology?

- ✓ Intersection [*temporal and spatial*]
- ✓ Downscaling [*regular grid 0.25*°]
- ✓ Comparison [*pixel-based*]
- ✓ Results

EUMETSAT HSAF Quality control over dependent products CNR ISAC





Ground data quality control



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Comparison between products







- Quality Assessment service monitors the QUALITY of (HSAF) precipitation products;
- Quality checked products became OPERATIONAL and then are available to end-users (via Eumetcast, FTP and website);
- Various independent datasets as REFERENCE (EU ground, GPM-DPR, Global data, ...)
- QA will monitor CONTINUOUSLY and in NRT the quality of the different precipitation products and the ROBUSTNESS of reference data! (very soon)

k you for your attention



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