

NWC SAF GEO Precipitation Products: Present Status and Future Developments

NWC SAF 2015 Users Workshop

24 – 26 February 2015

AEMET - Madrid

Cecilia Marcos

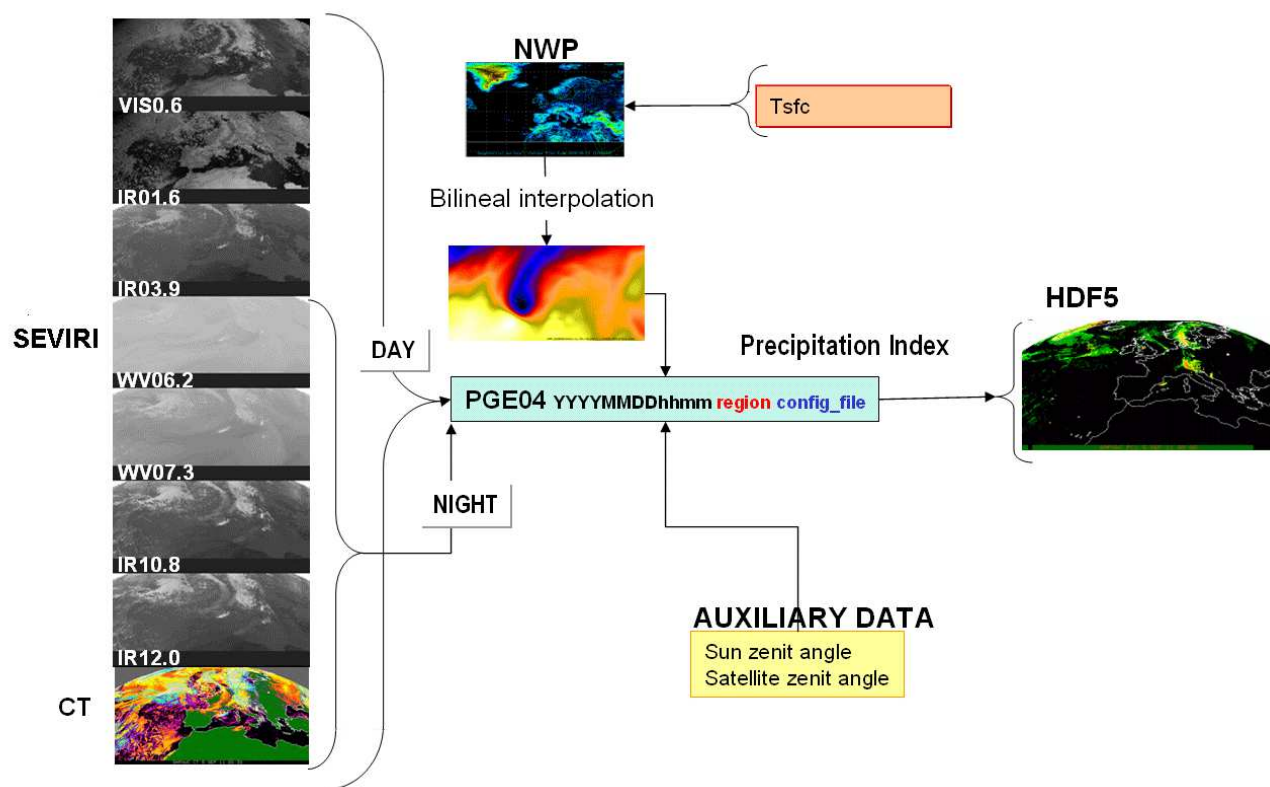
Juanma Sancho

Overview

- Precipitating Clouds (PGE04)
- Convective Rainfall Rate (PGE05)
- Precipitation Products from Cloud Physical Properties (PGE14)
- Future Developments
- Validation:
 - Traditional Methods
 - New Spatial Validation Methods: Preliminary Results

Precipitating Clouds (PGE04)

Input and output diagram



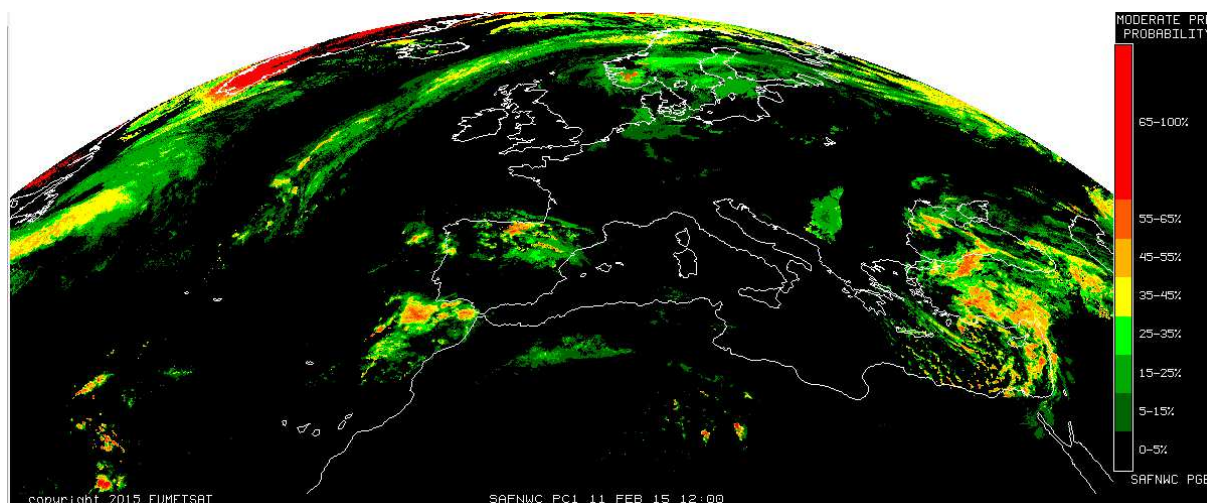
Precipitating Clouds (PGE04)

OUTPUTS:

The PC product shall consist of a numerical value for the likelihood

The following probability classes will be used:

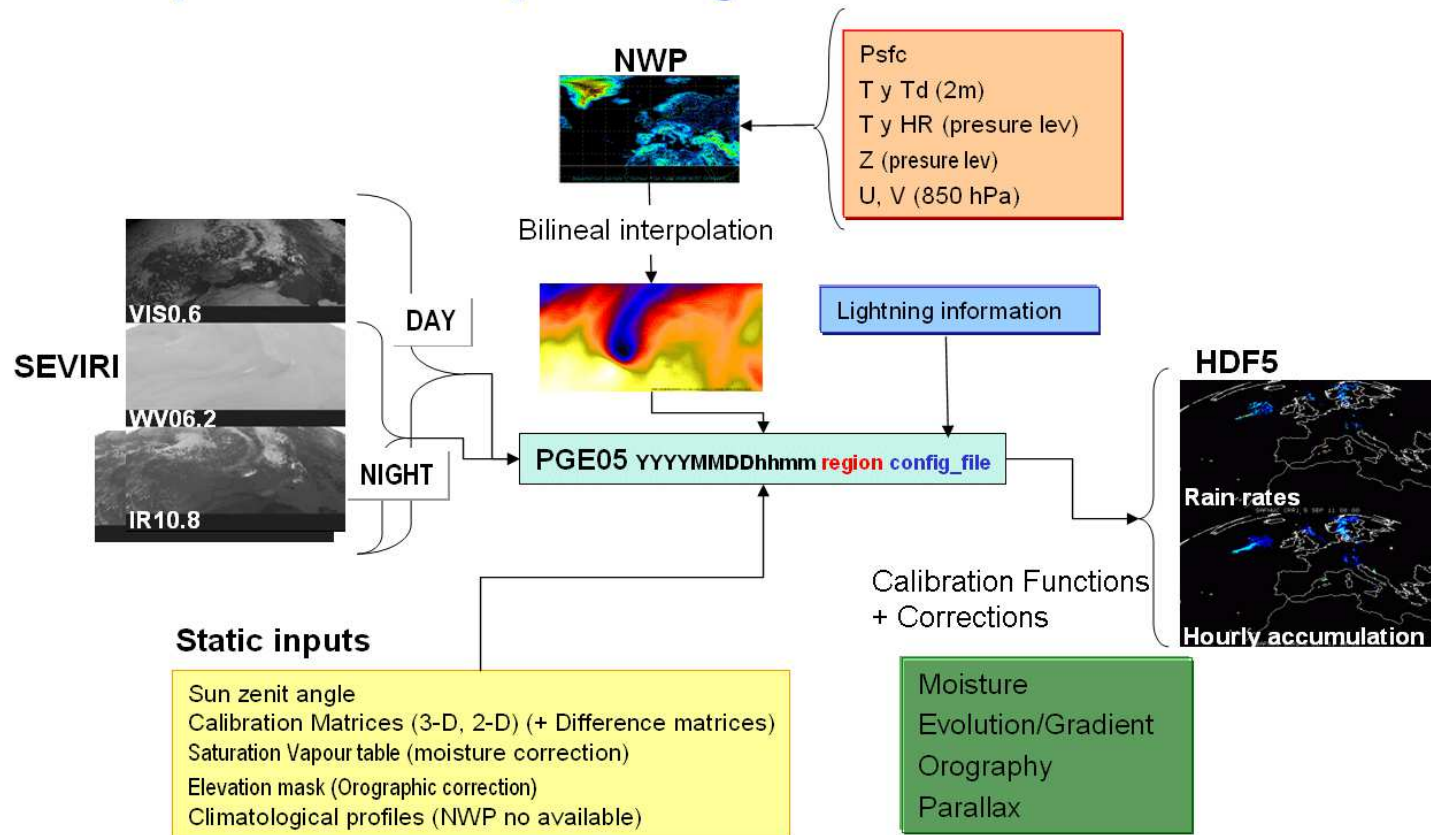
0% (= 0-5%)
10% (= 5-15%)
20% (= 15-25%)
30% (= 25-35%)
40% (= 35-45%)
50% (= 45-55%)
60% (= 55-65%)
70% (= 65-75%)
80% (= 75-85%)
90% (= 85-95%)
100% (= 95-100%)



FLAG: information about the processing conditions

Convective Rainfall Rate (PGE05)

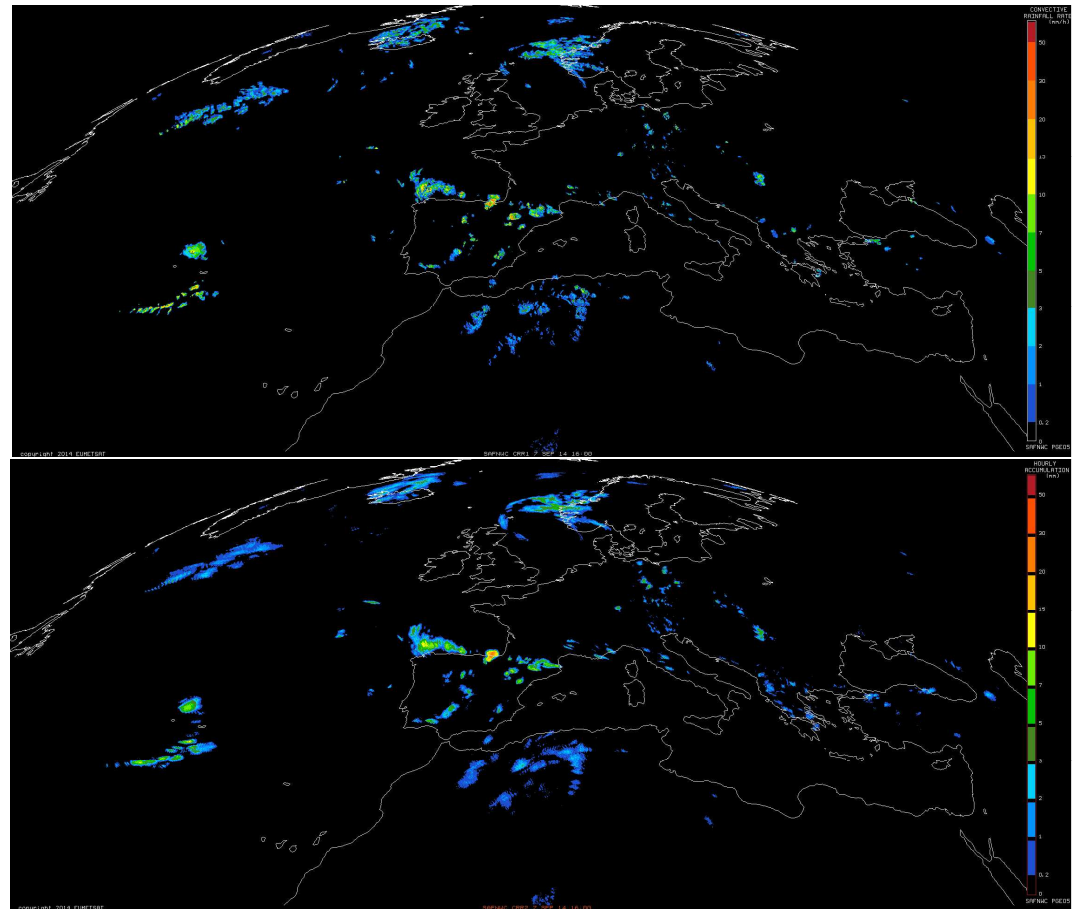
Input and Output diagram



Convective Rainfall Rate (PGE05)

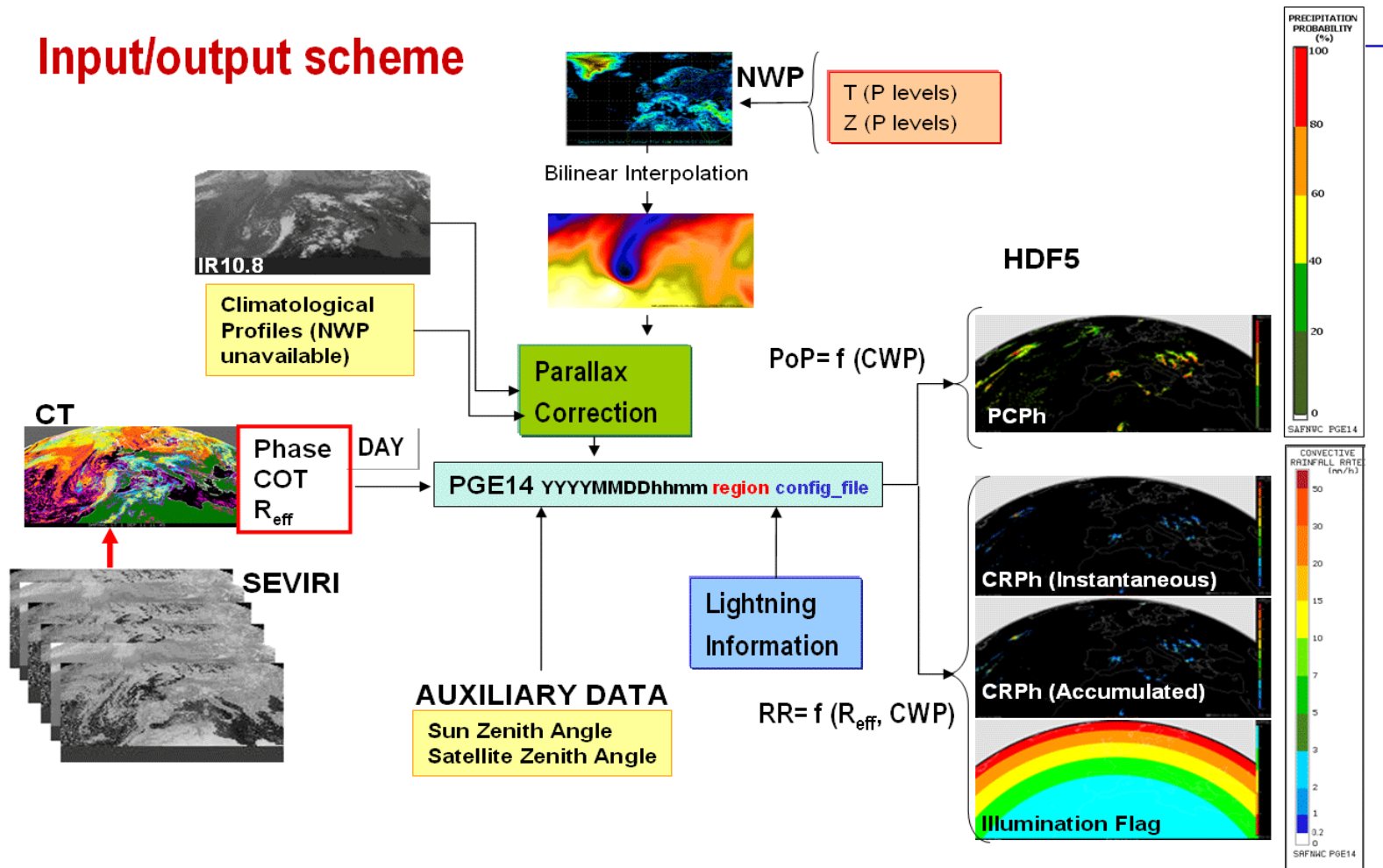
OUTPUTS:

- CRR rainfall rates expressed in classes
- CRR rainfall rates expressed in mm/h
(required for hourly accumulations)
- CRR Hourly Accumulations
- CRR-QUALITY
- CRR-DATAFLAG



Precipitation Products from Cloud Physical Properties (PGE14)

Input/output scheme



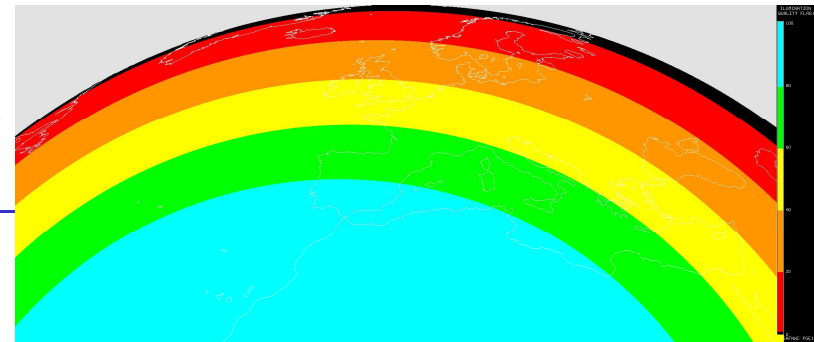
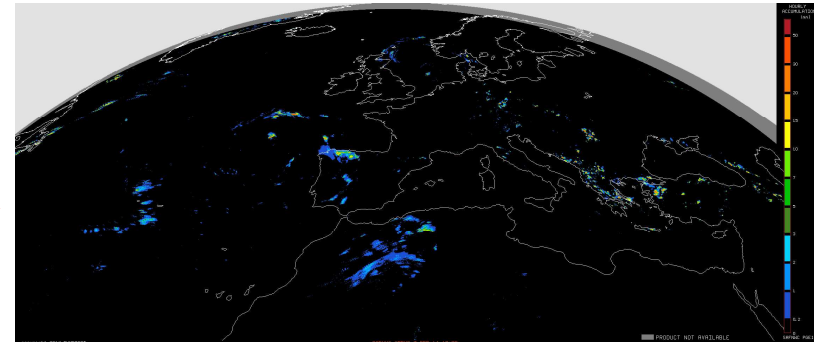
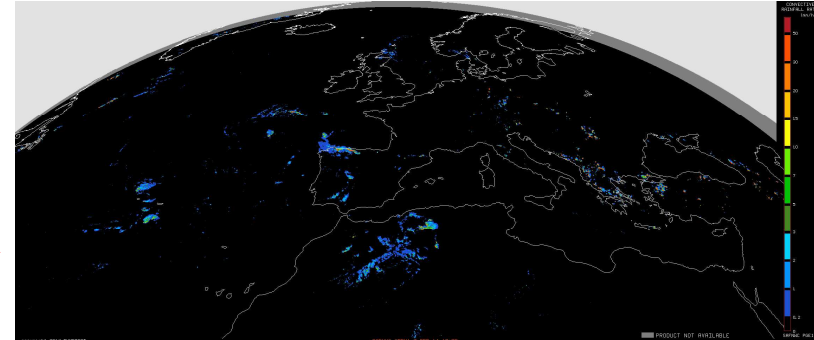
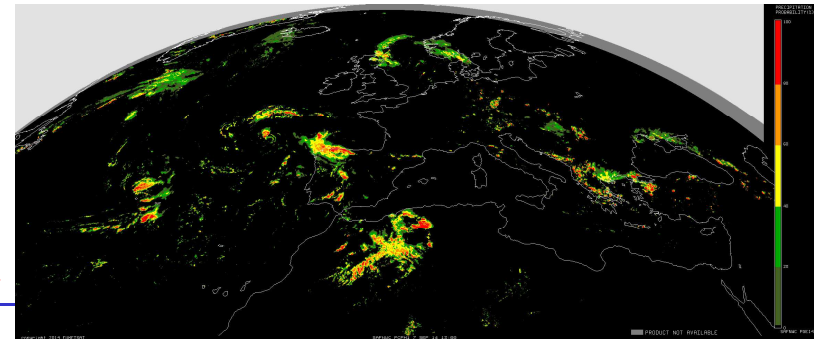
Precipitation Products from Cloud Physical Properties (PGE14)

PCPh OUTPUTS:

- PCPh Probability of precipitation from 0% to 100% of probability.
- PCPh_QUALITY (Parallax info)
- PCPh_DATAFLAG

CRPh OUTPUTS:

- Rainfall rates from 0.0 to 51.0 mm/h with a step of 0.2 mm/h.
- CRPh Hourly Accumulations
- CRPh Illumination Quality Flag
- CRPh_QUALITY
- CRPh_DATAFLAG



Precipitation Products from Cloud Physical Properties (PGE14)

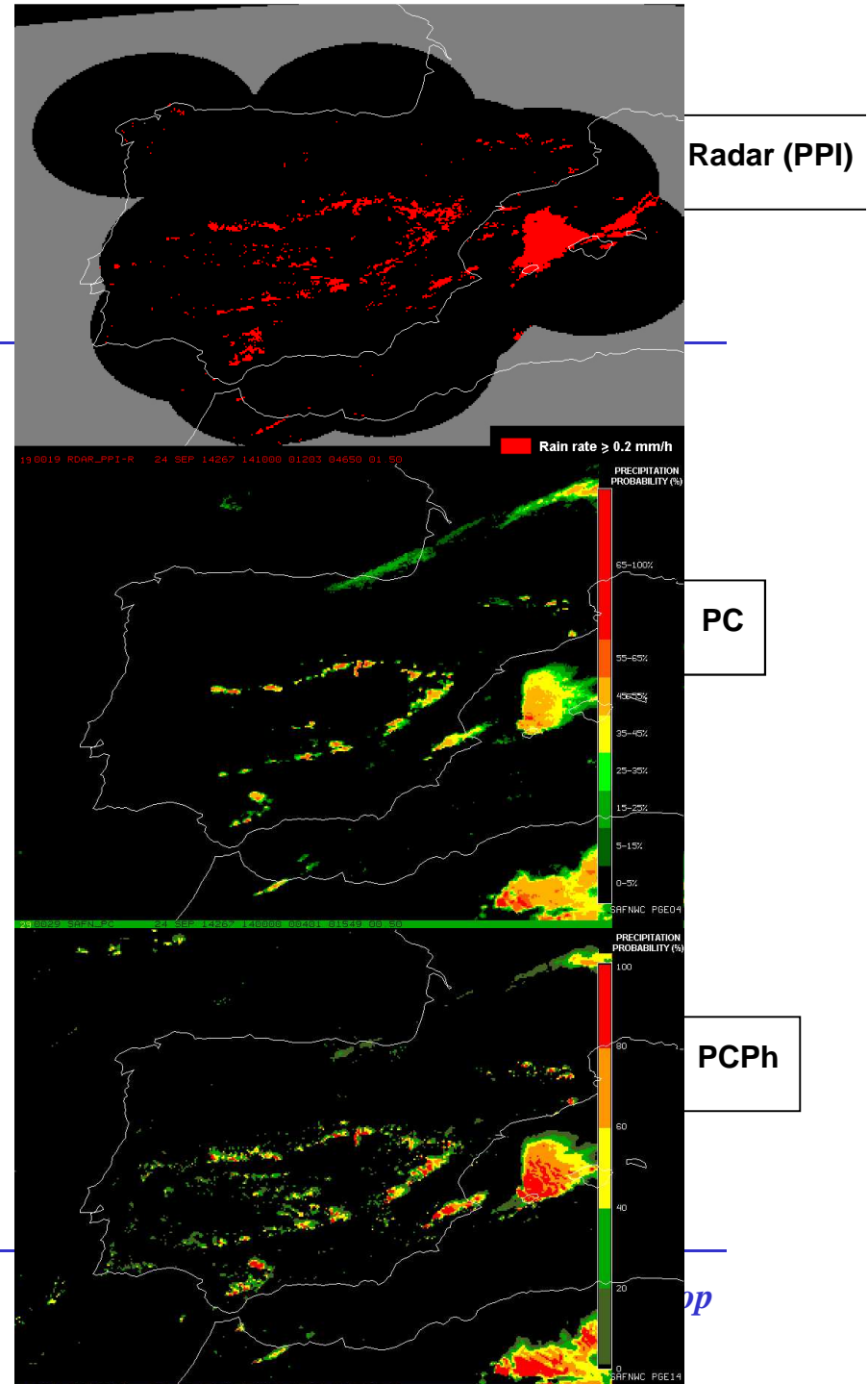
PCPh cons and pros with respect to PC:

CONS:

- Only day time
- Only for estimated phase
- Some dependance on illumination conditions

PROS:

- More confidence on the assignment of the precipitation likelihood



Precipitation Products from Cloud Physical Properties (PGE14)

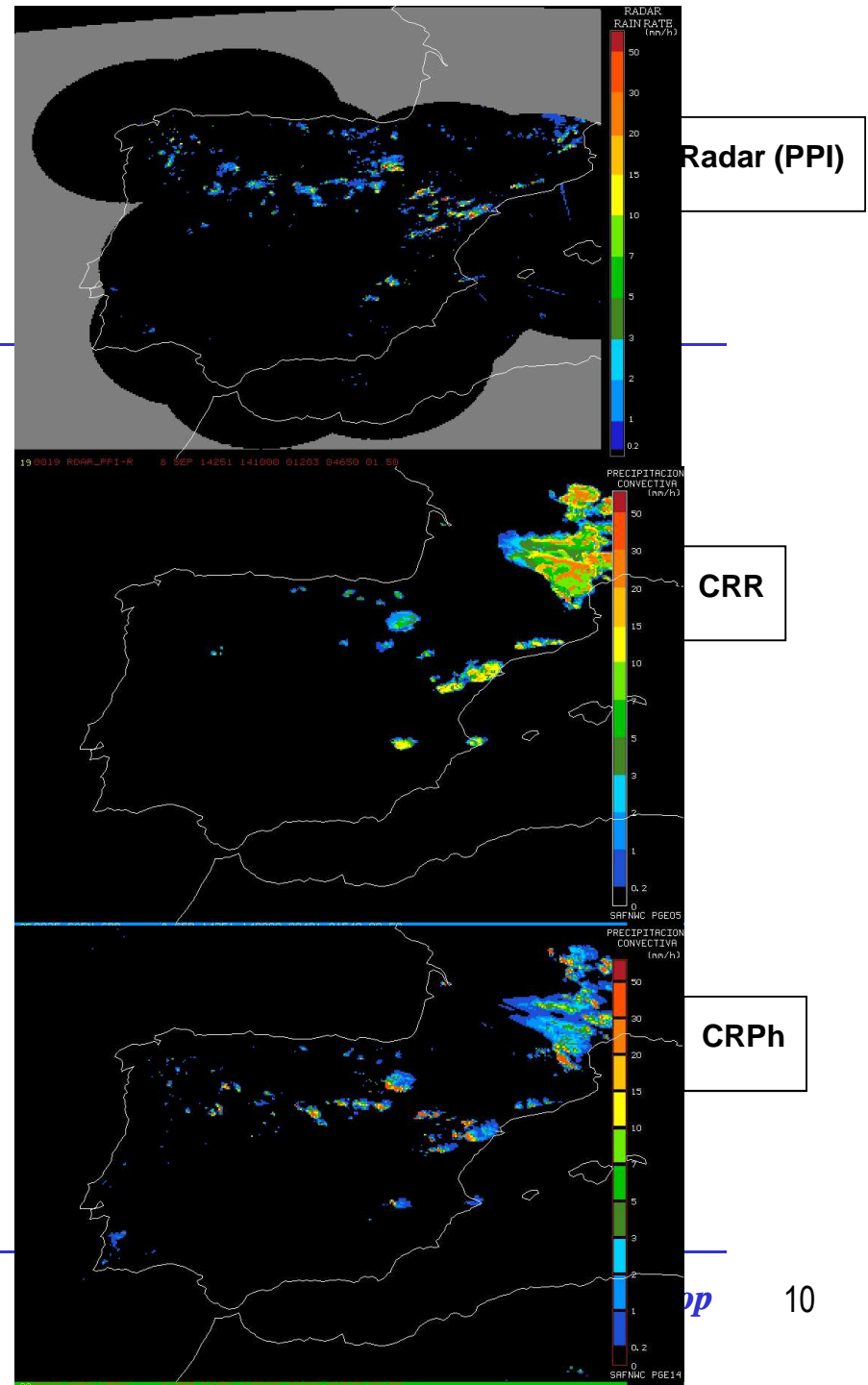
CRPh cons and pros with respect to CRR:

CONS:

- Only day time
- Only for estimated phase
- High dependence on illumination conditions

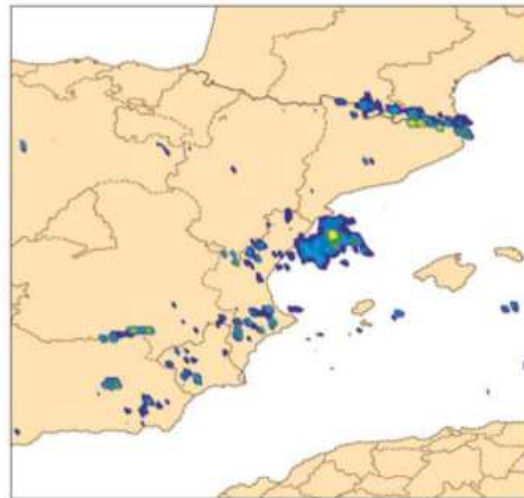
PROS:

- Precipitation areas and intensities closer to the radar ones
- Improvement of the Cold Rings problem
- Detection of smaller precipitation nuclei
- Detection of precipitation for warm top clouds

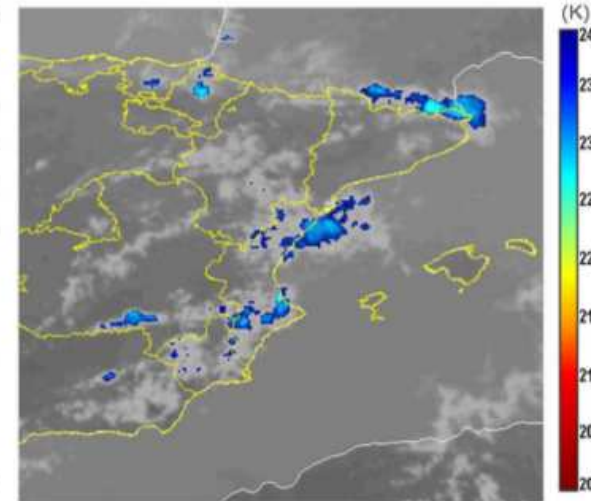


Precipitation Products from Cloud Physical Properties (PGE14)

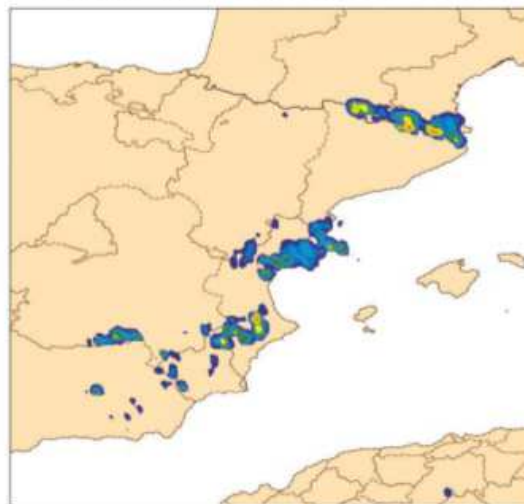
Radar Precip. 11 Aug 2012 at 14:10 UTC



SEVIRI IR10,8 11 Aug 2012 at 14:00 UTC



CRPh Precip. 11 Aug 2012 at 14:00 UTC

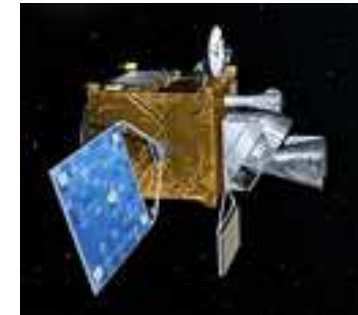


CRR Precip. 11 Aug 2012 at 14:00 UTC

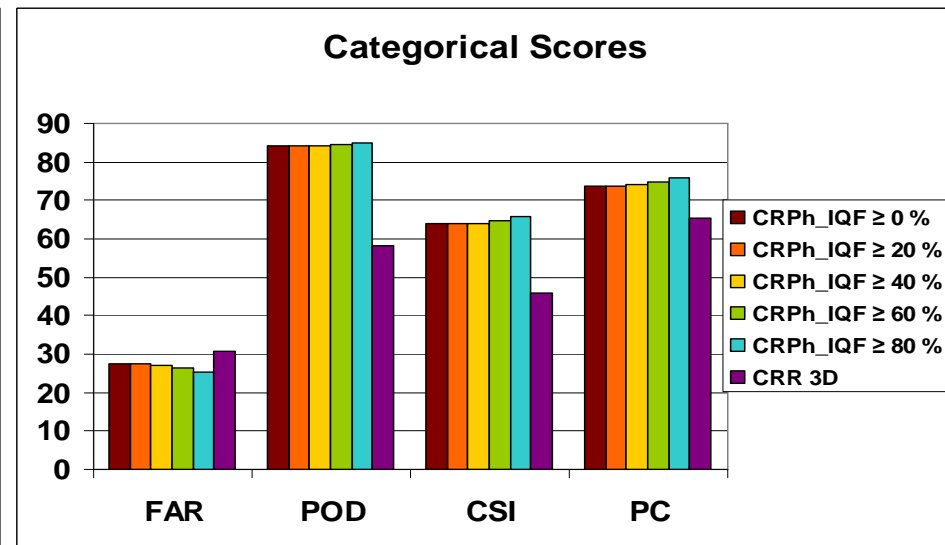
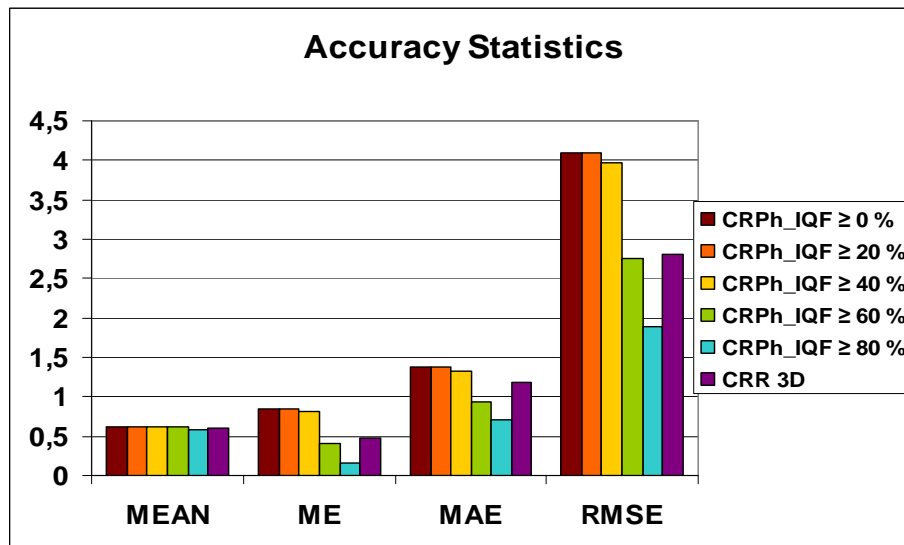
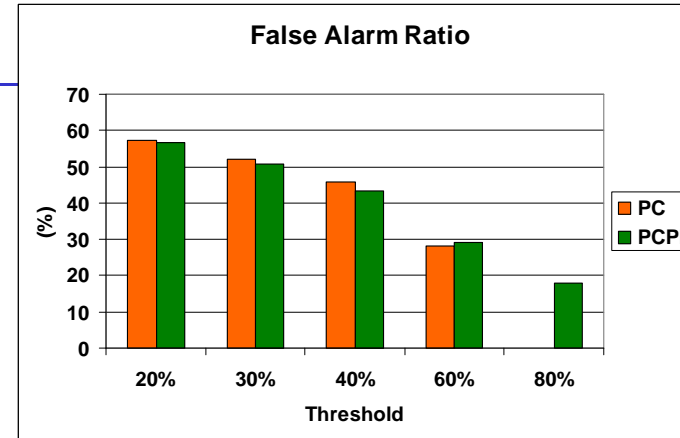
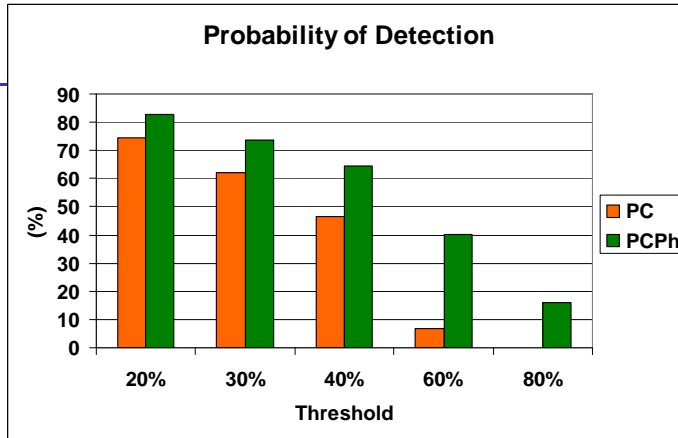


Future Developments

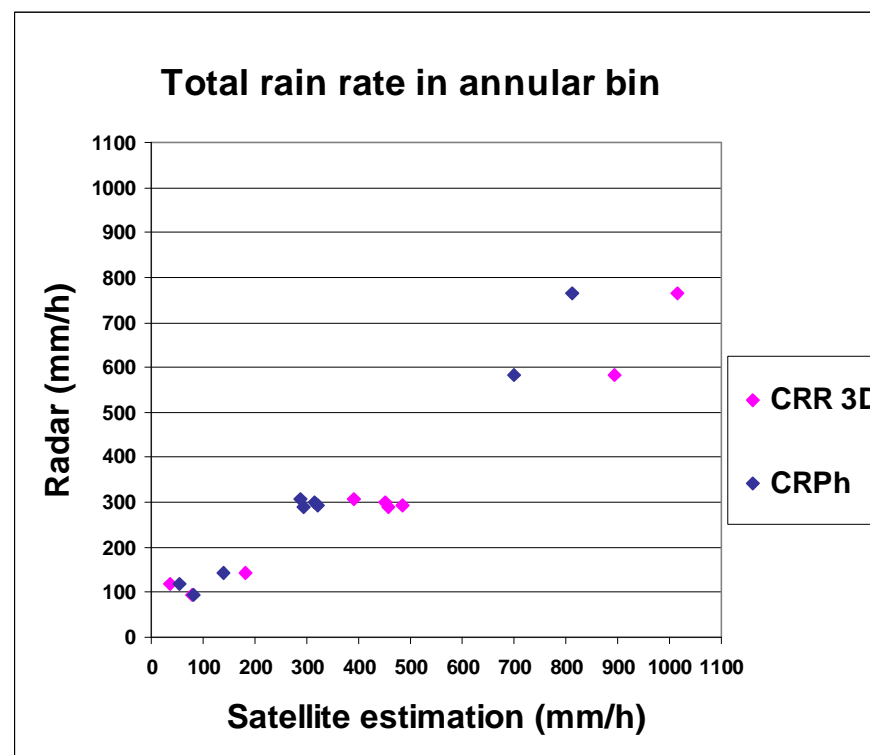
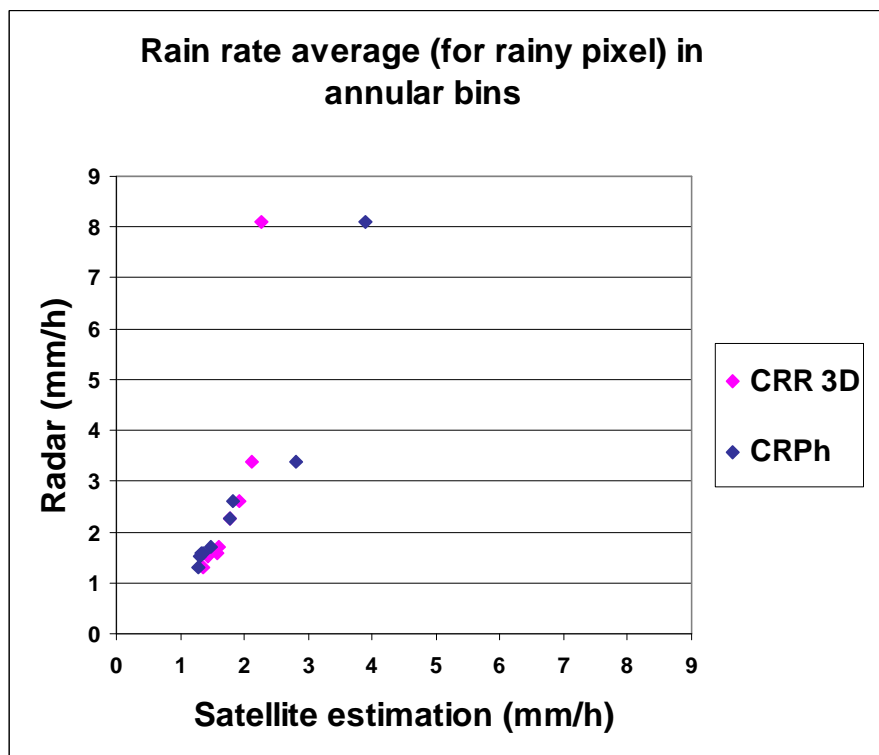
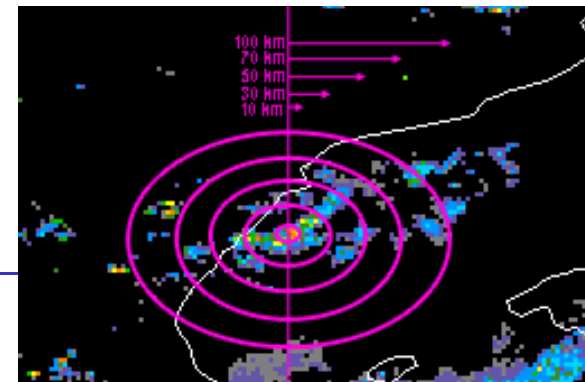
- **Precipitation algorithms will be adapted to MTG imager**
- **Precipitation algorithms will be improved in order to fully take advantage of MTG benefits**
- **CRR-Ph will be adapted to work with MTG LI**
- **Precipitation algorithms will be adapted to Himawari 8/9 series and GOES-R**



Validation: Traditional Methods



Validation: Traditional Methods



Validation: Spatial Methods (MODE)

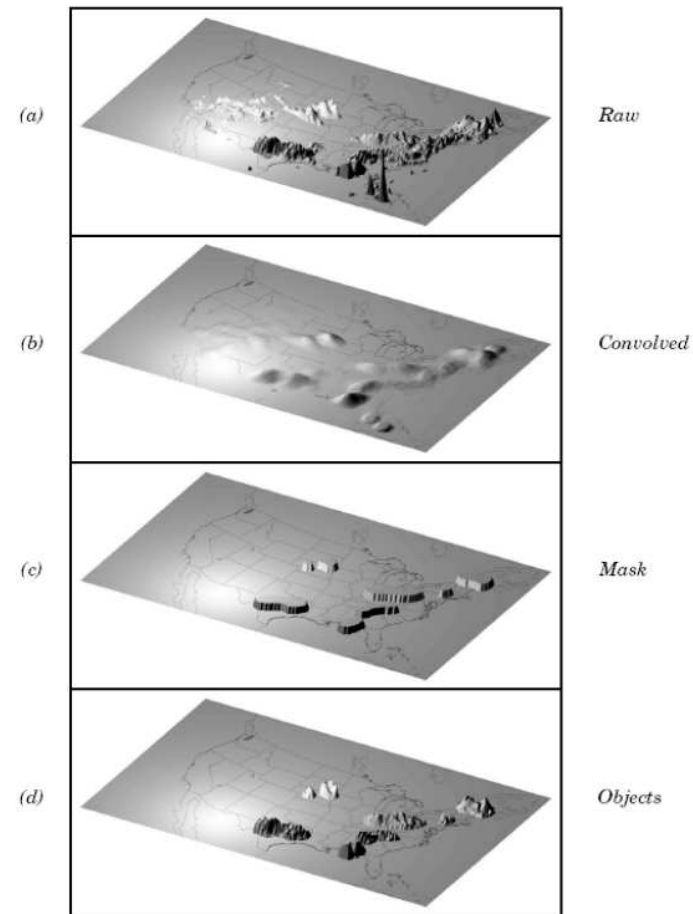
AEMET is currently studying the MODE (Method for Object-Based Diagnostic Evaluation) validation method that was specifically designed by NCAR to validate precipitation fields from numerical models.

MODE objectively identifies “objects” that are relevant to a human observer. These objects can be described geometrically.

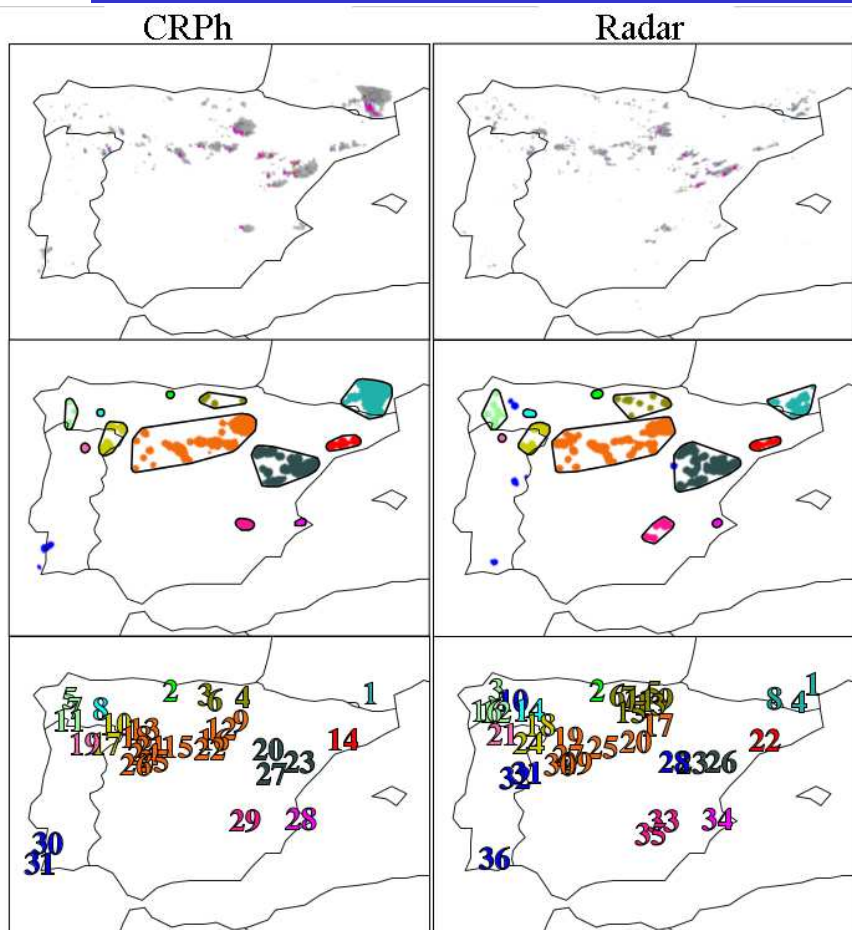
Several attributes, such as location, shape, orientation, and size, can be compared.

More info:

http://www.dtcenter.org/met/users/http://www.dtcenter.org/met/users/docs/users_guide/MET_Users_Guide_v1.0.pdf



Validation: Spatial Methods (MODE)

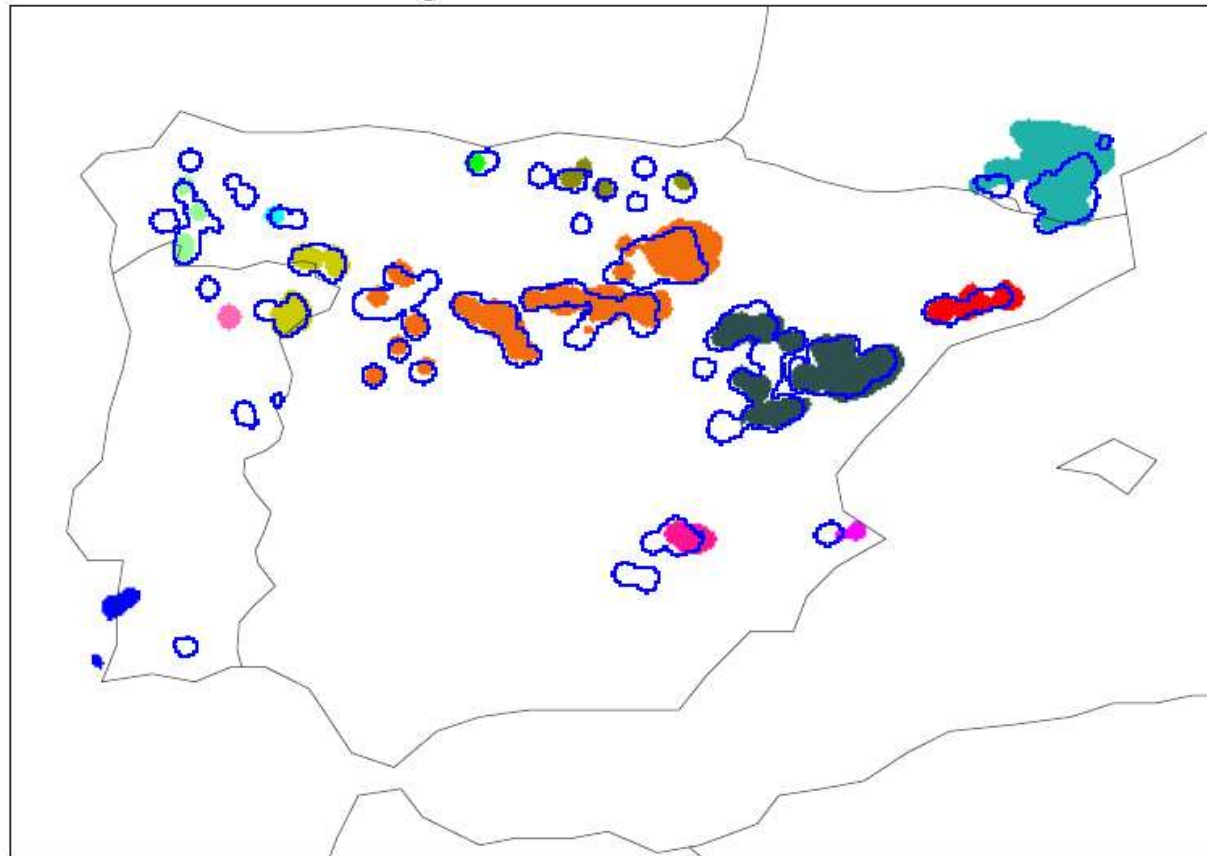


CRPh	Radar	Interest
9	17	1.0000
10	18	1.0000
16	20	1.0000
15	25	1.0000
23	26	1.0000
24	27	1.0000
26	30	1.0000
29	33	1.0000
3	7	0.9957
14	22	0.9952
6	11	0.9810
17	24	0.9802
25	29	0.9657
2	2	0.9630
8	14	0.9607
4	9	0.9461
28	34	0.9402
1	4	0.9254
11	12	0.9195
27	23	0.9084
21	19	0.8896
7	12	0.8868
13	19	0.8846
18	19	0.8801
1	8	0.8767
20	23	0.8767
5	12	0.8710
22	20	0.8696
1	1	0.8610

	CRPh	Radar
Mask M/G/P	on/off/off	on/off/off
Raw Thresh	>=0.00	>=0.00
Conv Radius	4	4
Conv Thresh	>=0.20	>=0.20
Area Thresh	>=3	>=3
Inten Thresh	p100>=0.00	p100>=0.00
Merge Thresh	>=1.25	>=1.25
Merging	thresh	thresh
Matching	match/merge	
Simple/M/U	31/29/2	36/31/5
Area	6849	7261
Area M/U	6711/138	6988/273
Cluster	12	12
MMI	0.9461	0.9224
MMI (F+O)	0.9402	

Validation: Spatial Methods (MODE)

CRPh Objects with Radar Outlines



NWC SAF GEO Precipitation Products

Thank you for your attention!