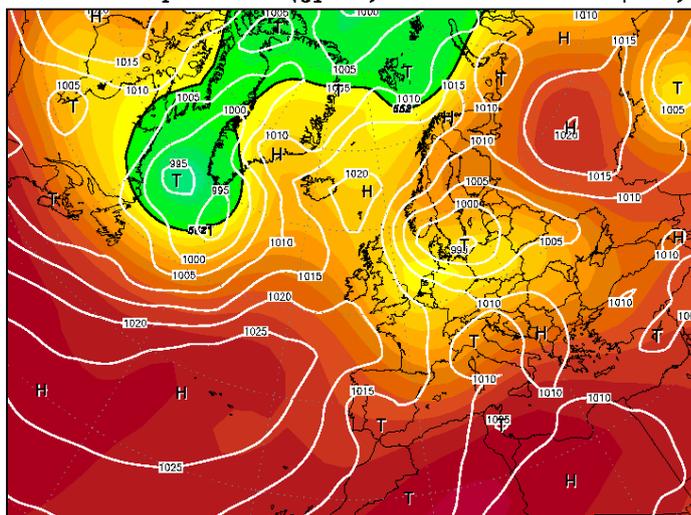


<b>PRODUCT NAME: PR-OBS-03v1.4C</b>		
<b>CASE STUDY PERIOD:</b> 23 July 2011	<b>METEOROLOGICAL EVENT:</b> Thunderstorms and widespread precipitation over Italy	
<b>VALIDATION INSTITUTE:</b> University of Ferrara	<b>Responsible:</b> Porcù F.	<b>Contact point:</b> <a href="mailto:porcu@fe.infn.it">porcu@fe.infn.it</a>
<b>PRODUCT DEVELOPER INSTITUTE:</b> CNR- ISAC	<b>Developers:</b> Laviola S., Cattani E.	<b>Contact point:</b> <a href="mailto:s.laviola@isac.cnr.it">s.laviola@isac.cnr.it</a>
<b>OPERATIONAL CHAIN INSTITUTE:</b> CNMCA	<b>Responsables:</b> Zauli F.	<b>Contact point:</b> <a href="mailto:zauli@meteoam.it">zauli@meteoam.it</a>

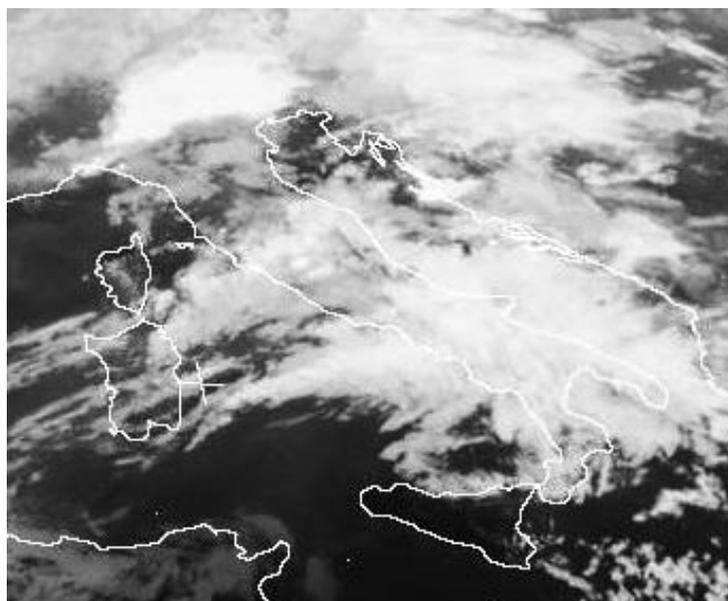
### METEOROLOGICAL EVENT DESCRIPTION

23JUL2011 00Z  
500 hPa Geopotential (gpm) und Bodendruck (hPa)



Daten: Reanalysis des NCEP  
(C) Wetterzentrale  
[www.wetterzentrale.de](http://www.wetterzentrale.de)

On July the 23<sup>rd</sup> 2011 at 00:00 UTC a weak and shallow depression is present over the Po Valley in northern Italy, advecting warm and moist air from SW (left image). This setting generates instability all over Italy, making the whole region prone to the development of local thunderstorms, with potential for meso-scale organization and orographic enhancement of the precipitation intensity.



The SEVIRI (12 μm channel) grayscale image of 23/07 at 06:00 UTC (on the left) shows well developed meso-scale convective cluster over northern Po Valley and central-eastern Alpine region, smaller scale thunderstorms over central Italy (on the Apennines) and widespread cloudiness, related to convective clouds dissipation, over southern Italy, excluded Sicily. Low level clouds are also present on the southern side of the Po Valley and central Italy.

## DATA/PRODUCTS USED

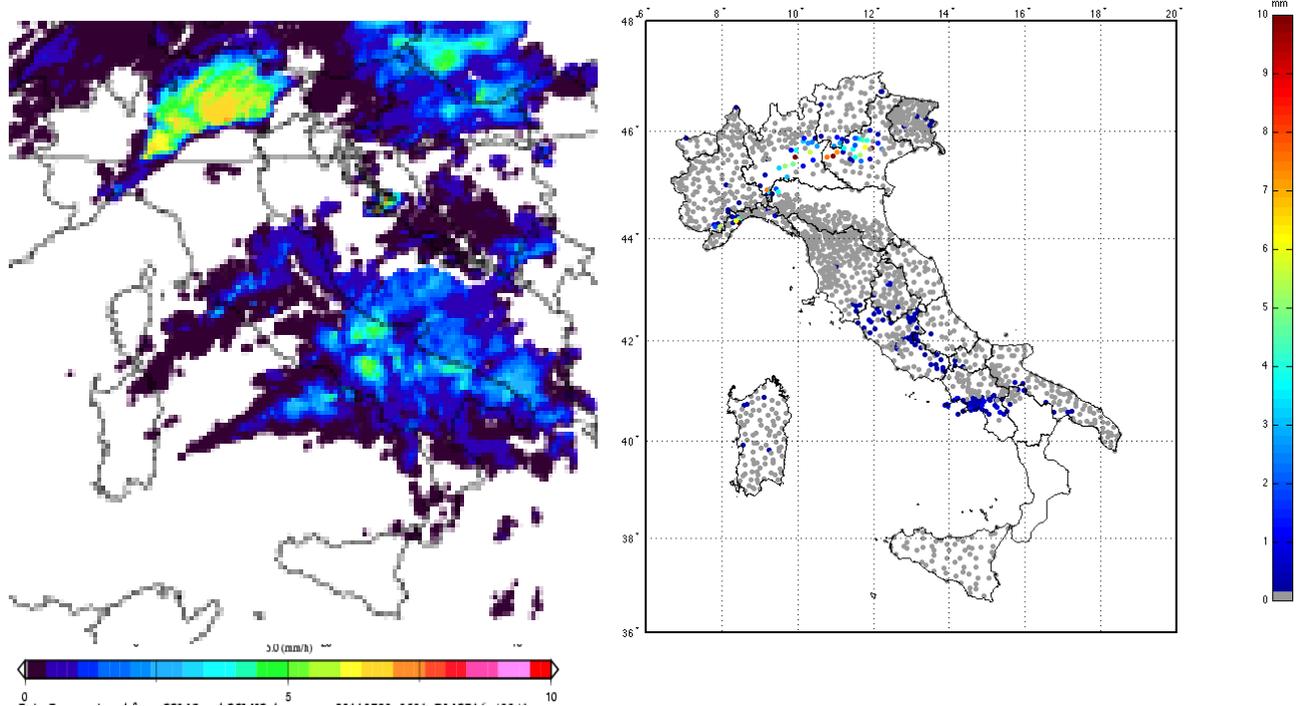
Reference data: Italian hourly raingauges network (provided by DPC)

Ancillary data (used for case analysis):

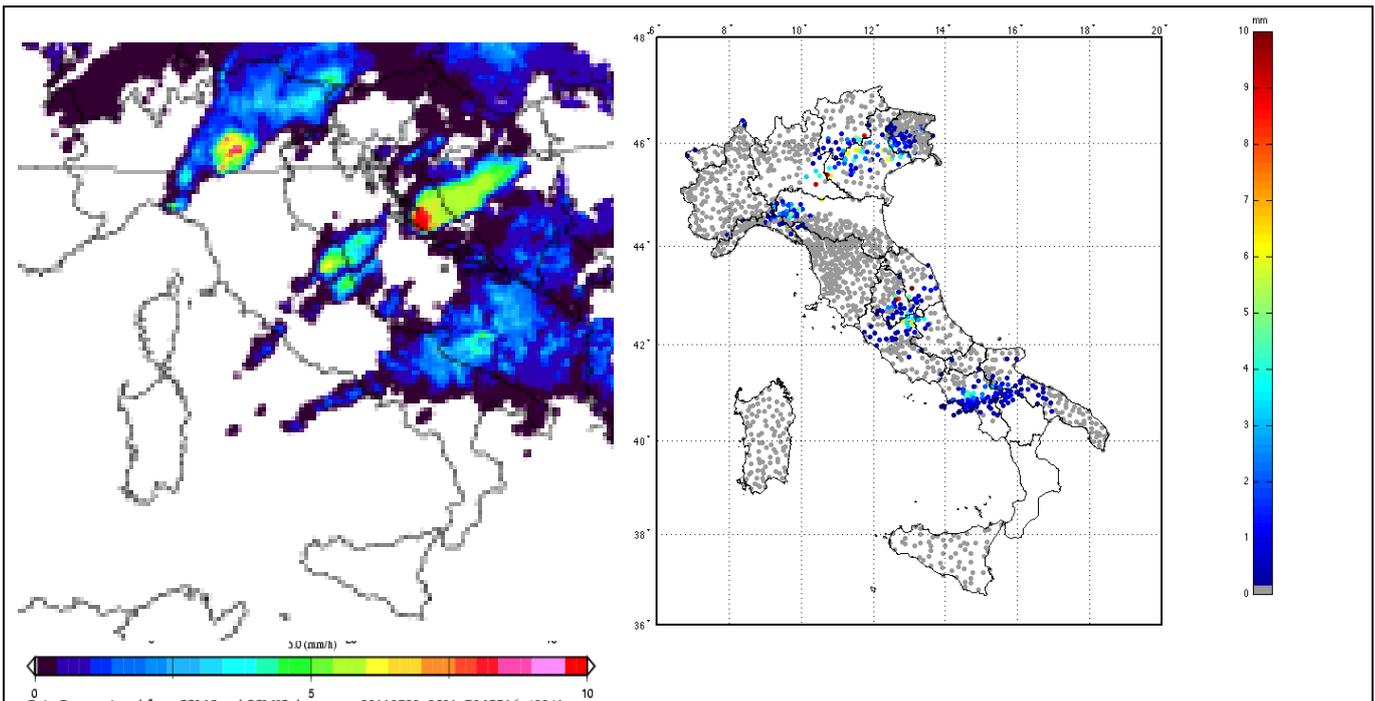
SEVIRI images (courtesy of University of Dundee – NEODAAS)

Weather charts (courtesy of Wetterzentrale)

## RESULTS OF COMPARISON



The rain gauge map of cumulated rainfall between 05:00 and 06:00 UTC (top right image) shows precipitation clusters over northern Po Valley, with higher peaks, over central Italy and around the Naples area, with moderate intensities. The maps of the h03 product at 05:57 shows remarkable skill in detecting high precipitation area in northern Italy, while other precipitation areas are greatly overestimated in terms of extension and rain amount. The FAR is therefore high (0.81) well above the POD (0.71), which is quite good, resulting in a poor ETS (0.09). The HSS is also low (0.13) but probably indicates that the rain intensity of the convective system on northern Italy is fairly well classified.



Two hours later rain gauges map (on the right) shows similar rain patterns, while the rain areas estimated by h3 (on the left) are sensitively smaller. This results in a greatly improvement of the statistical indicators: the FAR is highly reduced (0.49) and the POD is also reduced, but to still acceptable value (0.64), resulting in a marked increase of ETS (0.3) and HSS (0.33).

#### COMMENTS

The performance of h3 varies rapidly even at short time scale, and this is probably due to PMW recalibration occurred between the considered slots. The overestimation, however, seems to be still a big problem for this product.

#### INDICATIONS TO DEVELOPERS

The main problem seems to be the overestimation of the wet area extension, due to the IR misclassification of high level thin clouds.