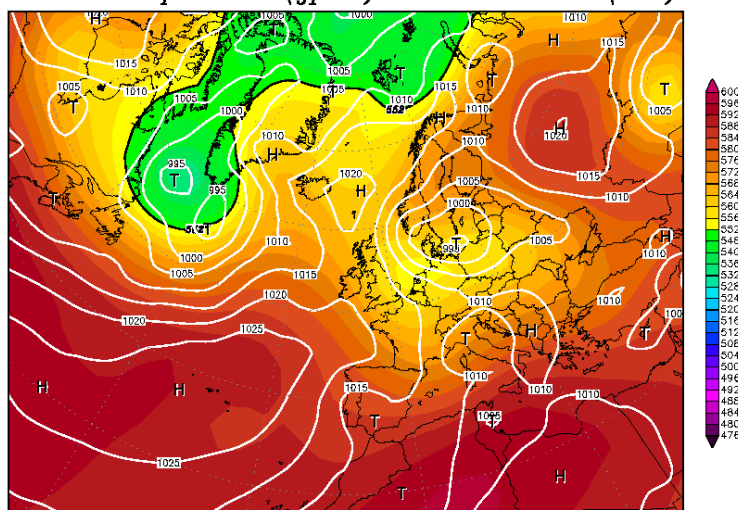


<b>PRODUCT NAME: PR-OBS-01v1.5</b>		
<b>CASE STUDY PERIOD:</b> 23 July 2011	<b>METEOROLOGICAL EVENT:</b> Thunderstorms and widespread precipitation over Italy	
<b>VALIDATION INSTITUTE:</b> University of Ferrara	<b>Responsible:</b> Porcù F.	<b>Contact point:</b> <a href="mailto:porcu@fe.infn.it">porcu@fe.infn.it</a>
<b>PRODUCT DEVELOPER INSTITUTE:</b> CNR- ISAC	<b>Developers:</b> Mugnai A., Casella D., Formenton M., Sanò P.	<b>Contact point:</b> <a href="mailto:a.mugnai@isac.cnr.it">a.mugnai@isac.cnr.it</a> <a href="mailto:p.sano@isac.cnr.it">p.sano@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

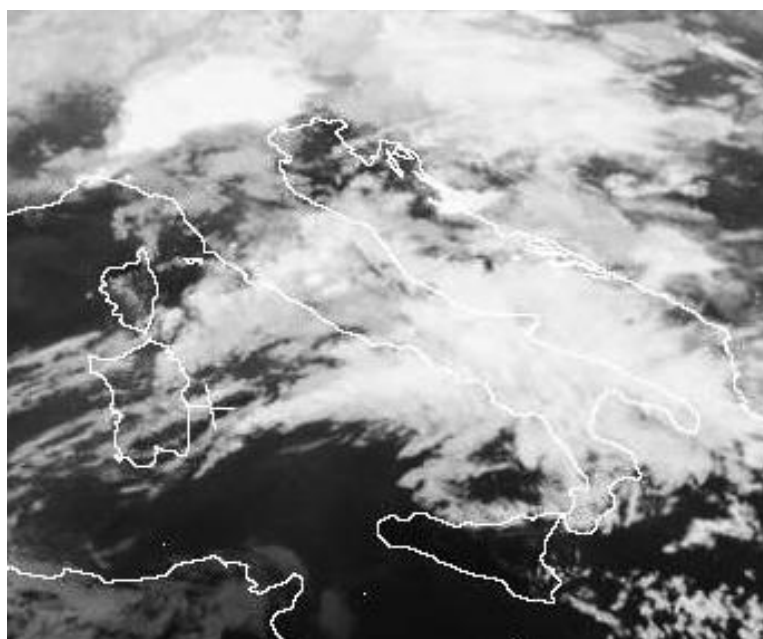
23JUL2011 00Z

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 00:00UTC 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 IR image at 06:00 on Jul the 23<sup>rd</sup> (on the left) shows well developed meso-scale convective cluster over northern Po Valley and central Alpine region, smaller scale thunderstorms over central Italy and widespread cloudiness, related to convective clouds dissipation over southern Italy. Low level clouds are also present.

## 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

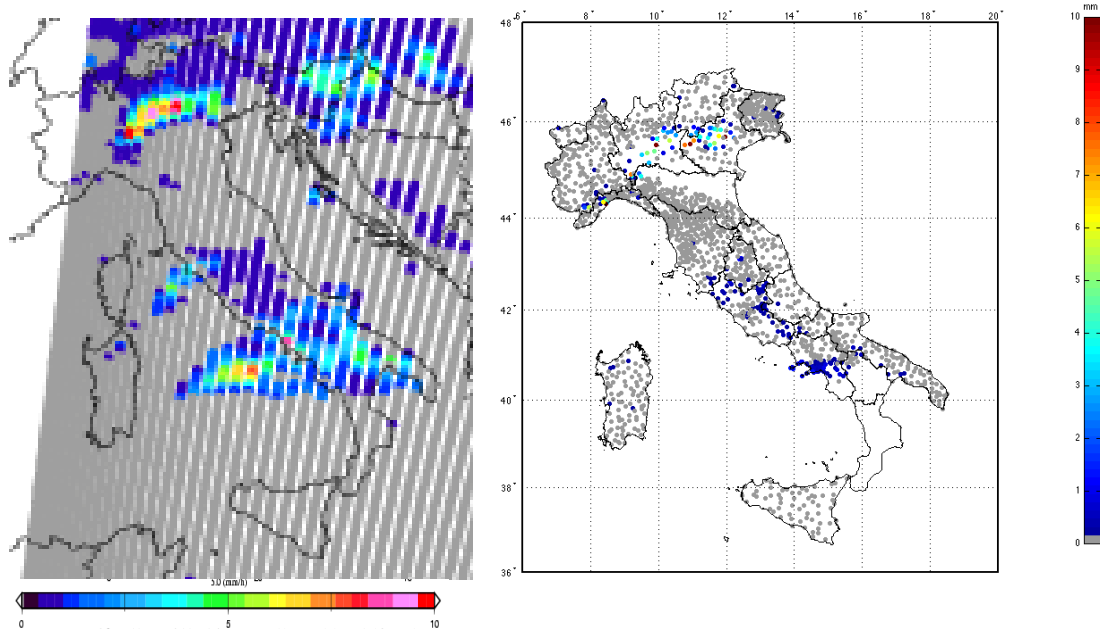


Figure. H01 precipitation map at 05:31 UTC (left) and raingauges hourly precipitation cumulated at 06:00 UTC (right) on July the 23<sup>rd</sup> 2011.

Raingauges map (top right) shows widespread precipitation over Po Valley (with intense peaks of more than  $10 \text{ mm h}^{-1}$ ), over central and over southern Italy (with moderate rainrates around  $5 \text{ mm h}^{-1}$  and lower). The H01 product (left panel) shows good skill in detecting intense rainrates over the Po Valley and low rainrates on central Italy. It is also evident marked overestimation of the rain area over the southern Alps (probably due to some spurious effect of the screening over high mountains) and over southern Italy, where both rain area extension and rain amounts are overestimates. This is confirmed by the quite high FAR (0.79), only partially balanced by a quite high POD (0.75) resulting on rather poor ETS (0.15). The HSS (0.22) is comparatively high, indicating good skill in correctly detecting high rainrate values.

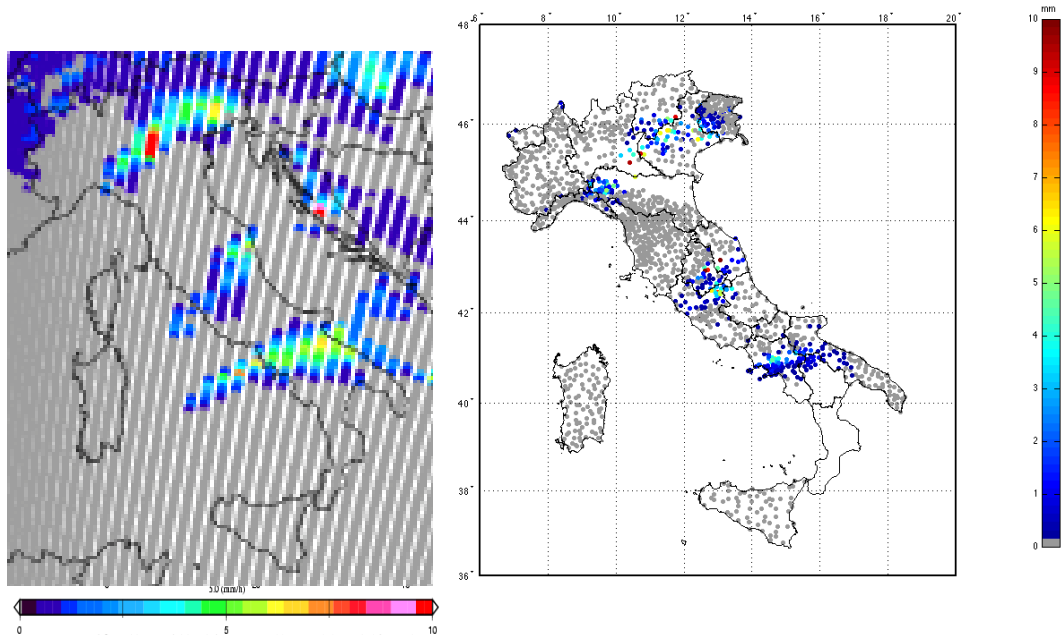


Figure. H01 precipitation map at 07:27 UTC (left) and raingauges hourly precipitation cumulated at 08:00 UTC (right) of July the 23<sup>rd</sup> 2011.

Similar results are obtained few hours later, when rain patterns moved to the east: the overestimation is markedly lower (FAR=0.57) and the POD (0.93) is increased with respect to the previous slot such as . ETS (0.30). HSS (0.34) indicates good capability in detecting correct precipitation rates, especially over Po Valley, where, unfortunately, the raingauge density is lower, and the quality of the validation dataset could be therefore lower.

#### COMMENTS

Quite good performances of h01 are assessed in case of mature, large scale, thunderstorms, in terms of rain area detection and precipitation rate estimates. Lower quality is measures in case of small scale convective systems and widespread precipitation, with moderate and low rates.

#### Indications to Developers

Probably the marked rain area overestimation occurred on the 05:31 UTC overpass could be due to bad background screening of the southern Alpine slope.