PRODUCT NAME: **OBS1v1.5 (H01)**		
CASE STUDY PERIOD: 07 October 2011	METEOROLOGICAL EVENT: Deep low pressure system with fronts	
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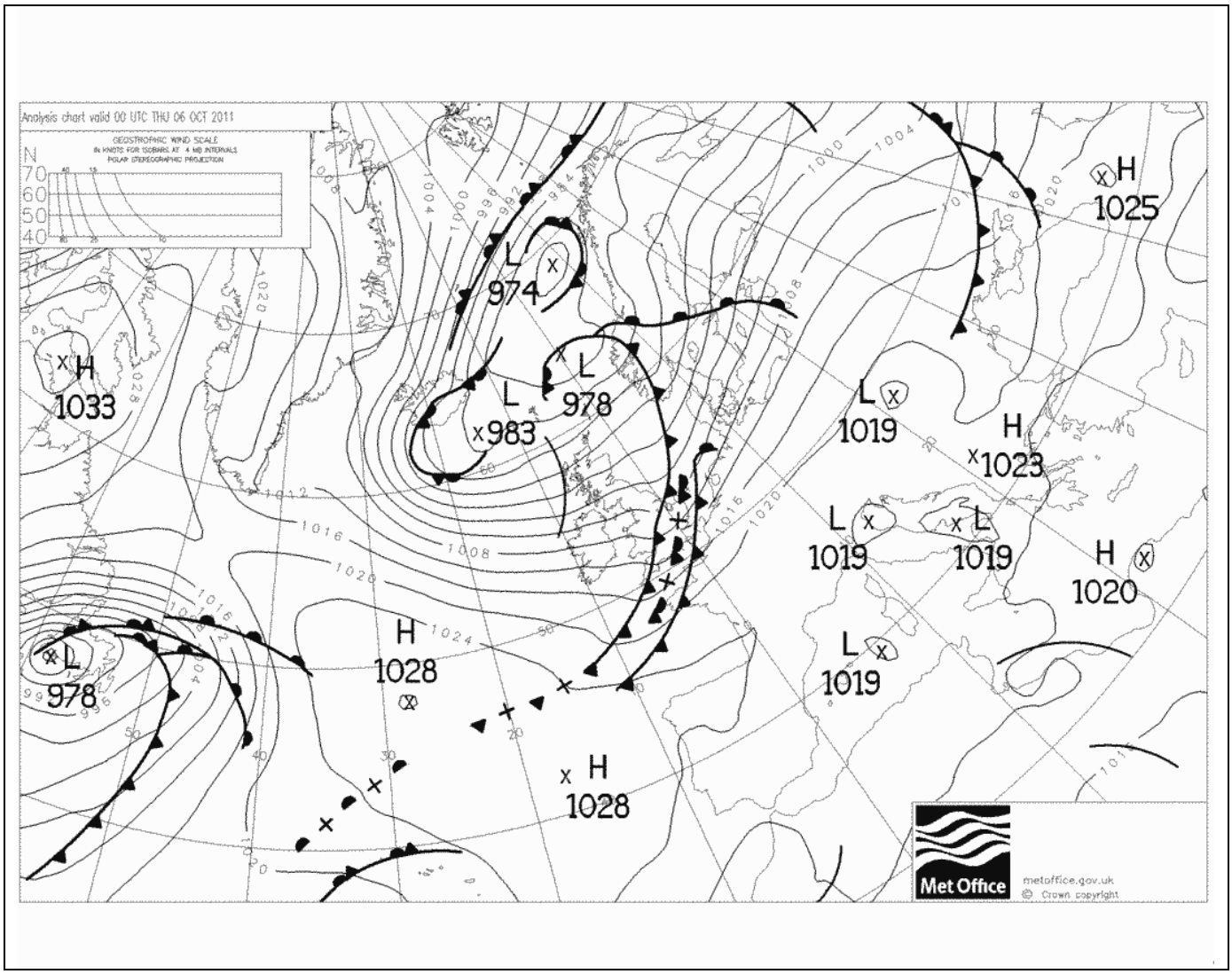
METEOROLOGICAL EVENT DESCRIPTION

The case we consider here is precipitation with rather low rain rate and significant duration. We had rainfall already starting on October 6 organized in a narrow strip slowly moving from northwest to southeast, following the cold front that produced it. On October 7, more rain fell as a small occluded front appeared behind the cold front in the North Sea. The precipitation pattern was this time more scattered with rather low rain rate, although temporarily higher rates could be observed over small areas.

The synoptic weather situation at 00:00 UTC October 06 and 07, 2011, is shown in the following maps.


Analysis chart valid 00 UTC THU 06 OCT 2011
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
H
1033
L
974
L
978
L
983
H
1025
L
1019
H
1023
L
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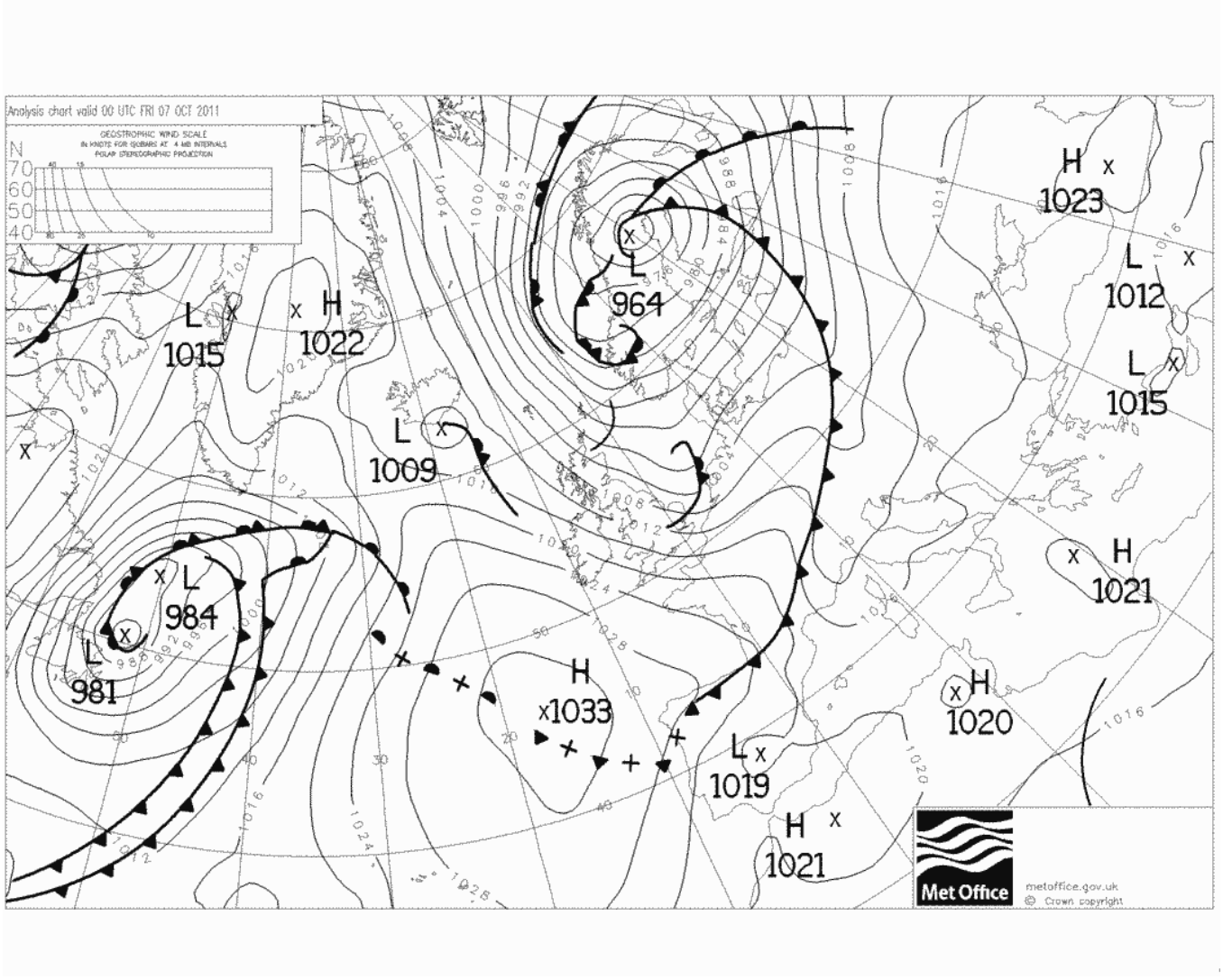
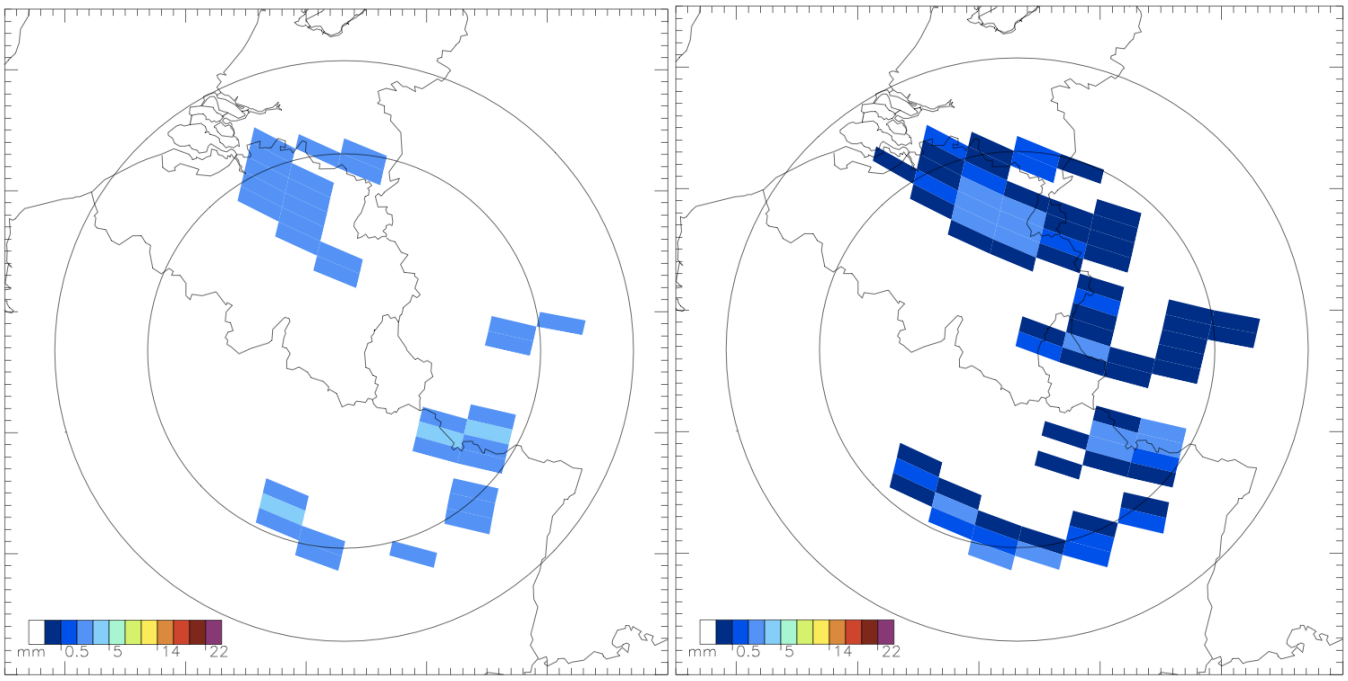


We can see a very active cyclogenesis taking place over Scandinavia. The deep depression is accompanied by many fronts, in particular by a very long cold front extending from Finland to Portugal.

DATA/PRODUCTS USED

We compare here the rain rate from OBS1v1.5 (H01) to the radar-observed rain rate. There is a small difference between the product and radar observation times.



Satellite (OBS1v1.5 on the left, at 06:18 UTC) and radar (on the right, at 06:20 UTC) on October 07, 2011.

The radar image on the right is the result of the up-scaling of the Wideumont radar data in the H01 grid at the moment of observation. It is clear that the satellite manages to capture fairly well the precipitation spatial pattern, despite some misses in areas with low rain rate (over Luxembourg and near the Belgium-The Netherlands border). In the areas where the satellite records precipitation, it provides also higher rain rates than the radar. These remarks are reflected in the tables below.

RESULTS OF COMPARISON

In order to compare quantitatively the two images, satellite and radar presented previously, we calculate a series of statistical measures. These are, for both radar and satellite observation: (1) percentages of pixels inside the radar range with precipitation rate equal or greater than 1.0 mm/h (P1Rad, P1Sat), 2.0 mm/h (P2Rad, P2Sat) and 5.0 mm/h (P5Rad, P5Sat); (2) maximum precipitation rate value (in mm/h) inside the radar range (MaxRad, MaxSat). Also, mean error (ME) and root mean square error (RMSE) are calculated.

Product	**Time**	**P1Rad**	**P2Rad**	**P5Rad**	**P1Sat**	**P2Sat**	**P5Sat**
OBS1v1.5	06:18	6.54%	0.93%	0.00%	15.89%	5.61%	0.00%

Product	**Time**	**MaxRad**	**MaxSat**	**ME**	**RMSE**
OBS1v1.5	06:18	2.29	4.89	0.11	0.65

The tables confirm that indeed, in this particular case, the product H01 produced more than twice as much pixels than the radar detection, with precipitation above certain thresholds. This would inevitably lead to a positive mean error. Also, the maximum precipitation value from the satellite is more than twice the radar value.

COMMENTS

The product OBS1v1.5 performed reasonably well in the case of rainy weather during an autumn night. Although the spatial precipitation pattern is rather well detected, in this case the satellite underestimates the area receiving rain but overestimates the rain rate.

Indications to Developers