PRODUCT NAME: **OBS2v2.3 (H02)**		
CASE STUDY PERIOD: 07 October 2011	METEOROLOGICAL EVENT: Deep low pressure system with fronts	
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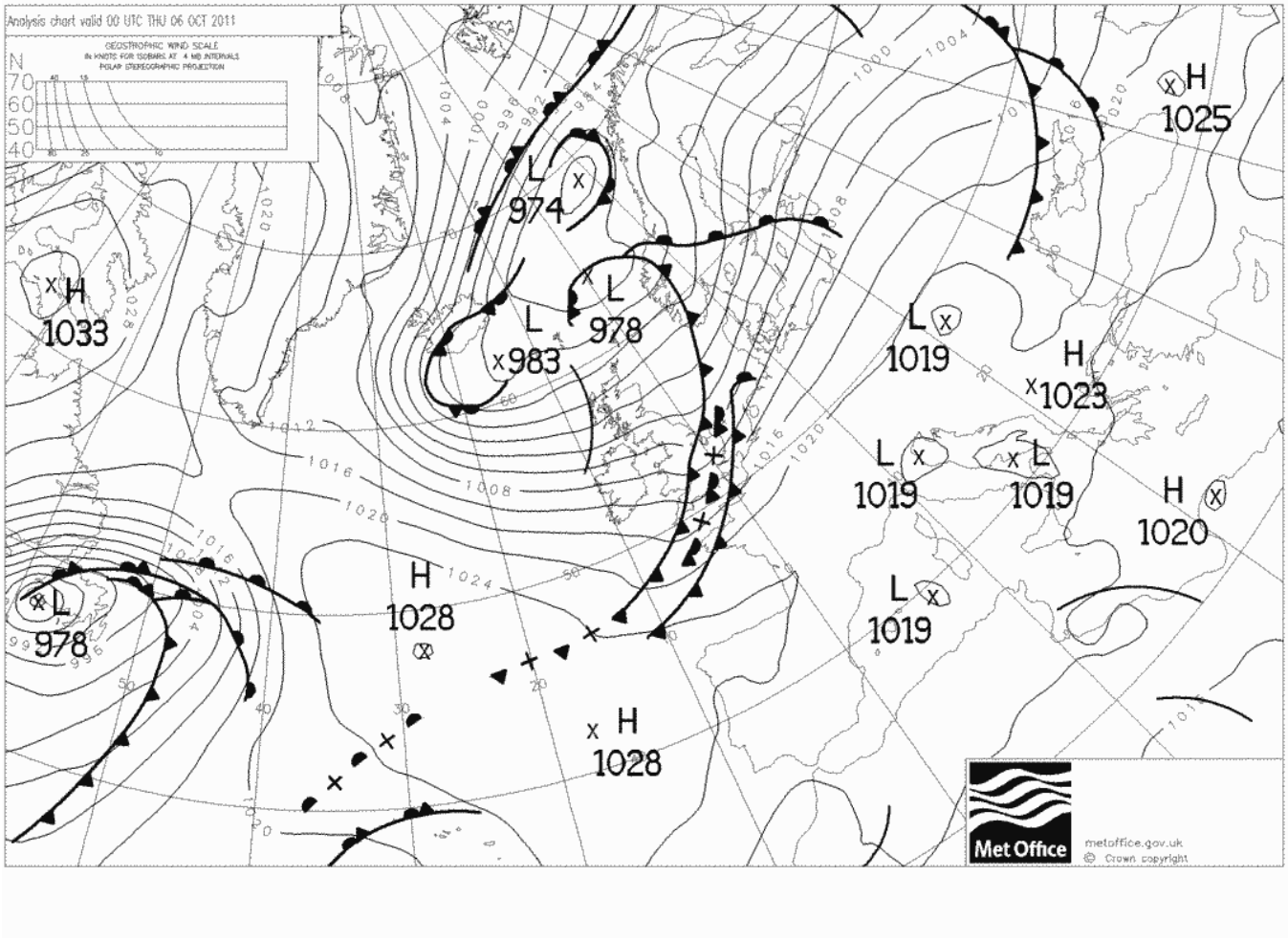
METEOROLOGICAL EVENT DESCRIPTION

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
1019
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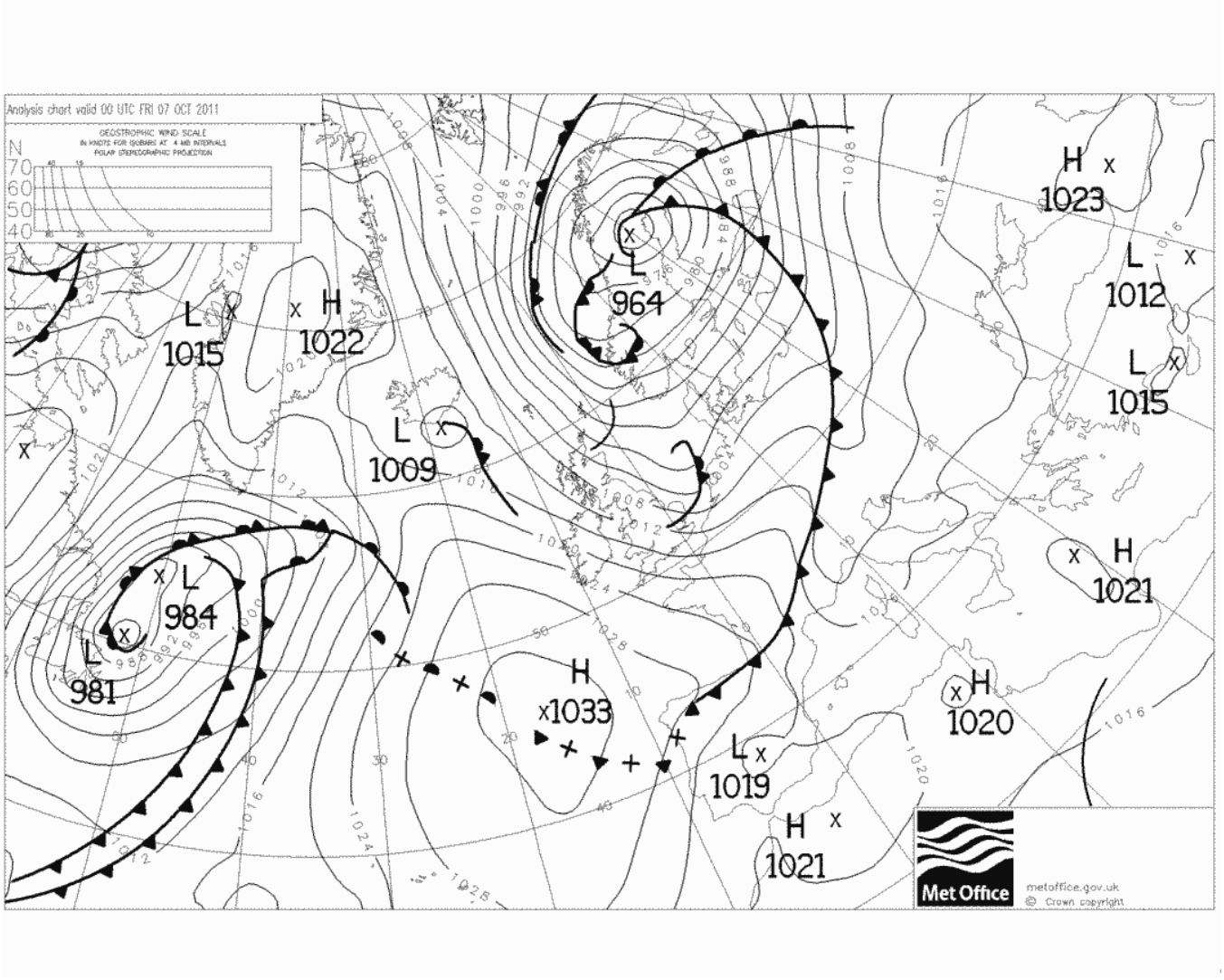
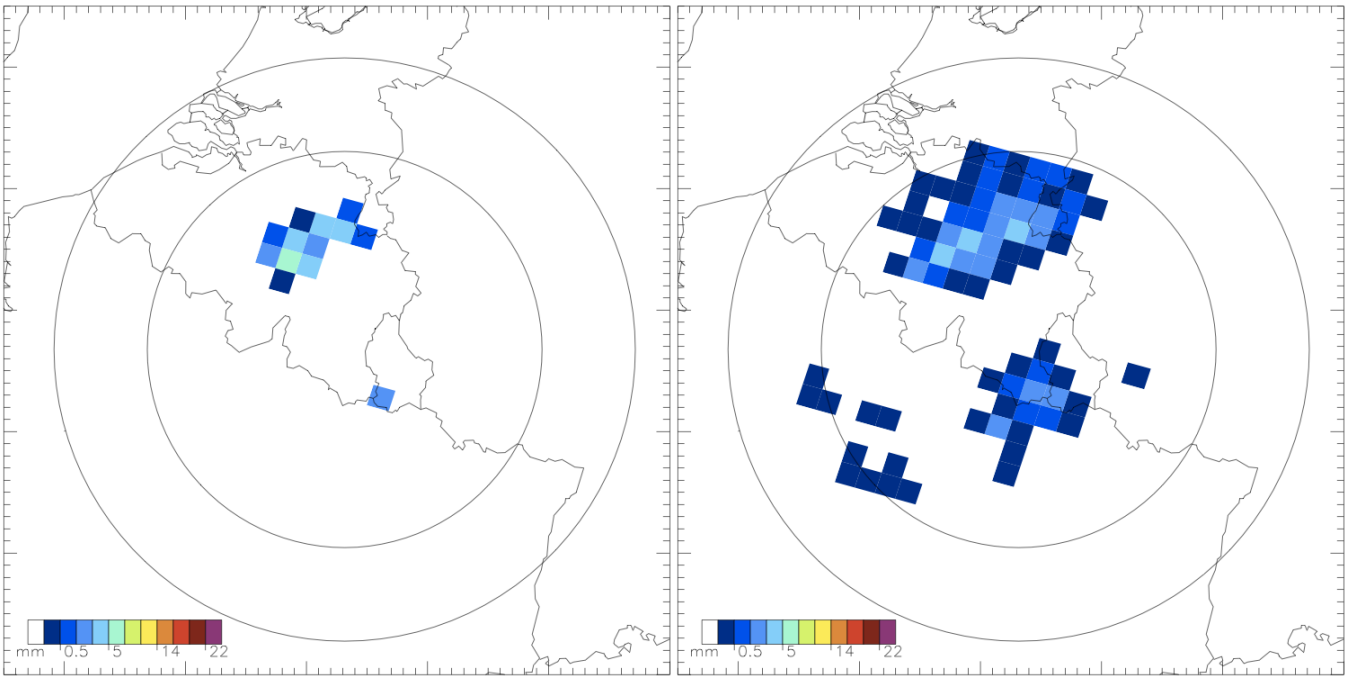


We can see a very active cyclogenesis taking place over Scandinavia. The deep depression is accompanied by many fronts, in particular by a very long cold front extending from Finland to Portugal.

DATA/PRODUCTS USED

We compare here the rain rate from OBS2v2.3 (H02) to the radar-observed rain rate. There is a small difference between the product and radar observation times.



Satellite (OBS2v2.3 on the left, at 02:54 UTC) and radar (on the right, at 02:55 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 H02 grid. We observe in this case that the H02 product is heavily underestimating the area receiving precipitation. Nevertheless, the high rain rate areas are still present in the correct locations.

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, the mean error (ME) and the root mean square error (RMSE) are calculated.

Product	Time	P1Rad	P2Rad	P5Rad	P1Sat	P2Sat	P5Sat
OBS2v2.3	02:54	5.53%	3.11%	0.00%	2.77%	2.42%	0.35%

Product	Time	MaxRad	MaxSat	ME	RMSE
OBS2v2.3	02:54	3.18	6.98	-0.09	0.44

The precipitation area underestimation by H02 is clearly depicted in the first table. The area receiving rain in the radar image is larger by a factor about 2 than in the satellite image for the first (lower) precipitation class. In the other classes, the percentages are much closer, confirming the remark of the previous section about the higher precipitation rate pixels. It is interesting that while the precipitation area appears shrunk in the satellite image, the maximum rain rate is more than twice the rain rate of the radar image.

COMMENTS

The type of weather associated to the present precipitation event is fairly common in northwestern Europe during autumn. This is a case where the product OBS2v2.3 significantly underestimates the area receiving precipitation. Moreover, the pixels with rain exhibit generally higher rain rates in the satellite than in the radar detection.

Indications to Developers