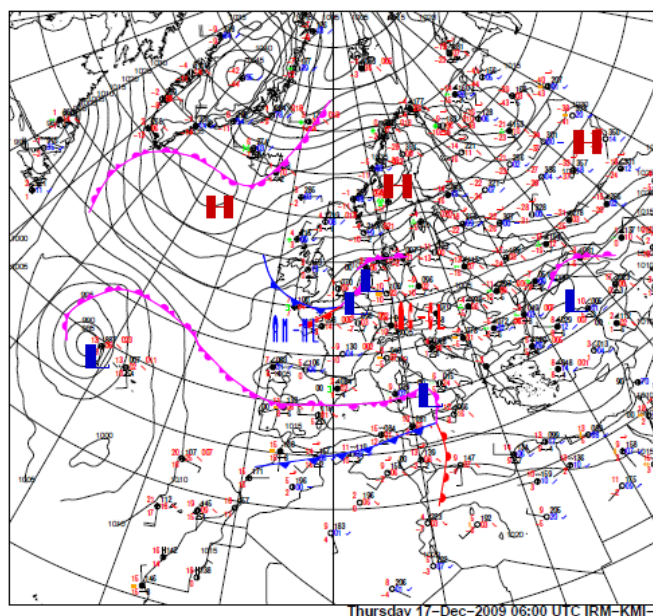


H-SAF CASE STUDY

Product Name	H10 – SN-OBS-01	Validation Institute	
Case Study Period	18-12-2009	Case Study Geographical Area	Belgium, Luxemburg

METEREOLOGICAL EVENT DESCRIPTION

The area covers the Southern part of Belgium and Luxemburg. The case study consists in the snow detection on the 18 Dec. 2009 after that snow had covered the Western part of the study area. The synoptic situation is summarised with the surface map on the 17 December 2009 at 06 UTC (Fig. 1) before that a precipitating zone (snow) crossed Belgium from West to East to vanish at the middle of the Ardennes.



map on the 17 December 2009 at 06 UTC, MSLP (hPa) and synoptic observations

DATA/PRODUCTS USED

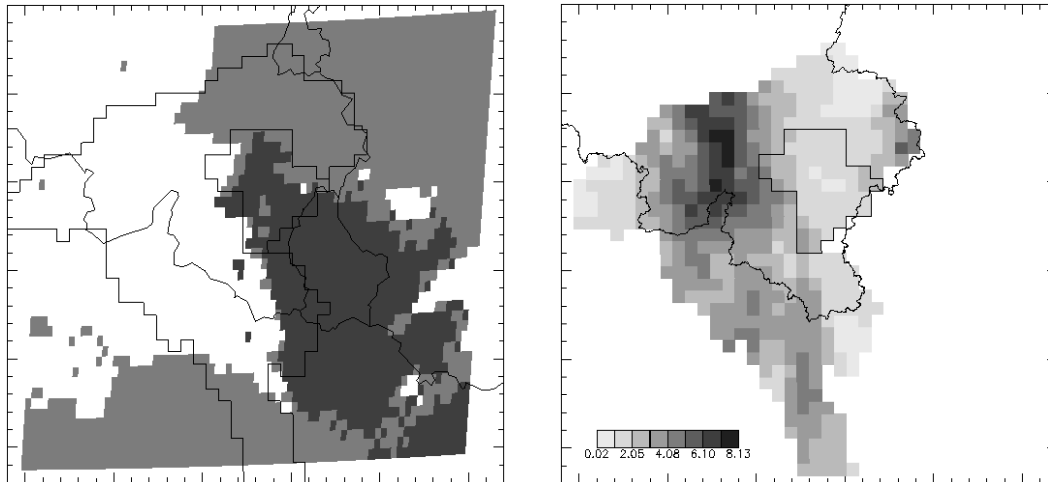
The H10 snow detection daily product of 18 Dec 2009 is compared with synoptic reports and with the snow water equivalent simulated with the SCHEME hydrological model. Out of the 16 synoptic stations, 7 have been discarded because snow was never reported during the previous winter despite that the entire domain had been covered during some events

RESULT OF COMPARISON

The day before (17th December 2009) snow (1 cm) was reported at only one station in the Ardennes. On the 18th, the four stations reporting a depth ≥ 2 cm were located in cloud free area and H01 correctly detects snow at the corresponding pixels. The synoptic station at Luxembourg is also in the large cloud-free zone, no snow is reported and land free of snow is correctly detected. Three stations correspond to cloudy pixels and only one station is not reporting snow whereas it is detected by H01.

The product is compared with the snow simulated with the SCHEME hydrological model on Fig.2. Fortunately, the limit of the extension of the snow area is not covered with clouds and it can be followed along some 150 km. Some cloudy pixels along the edge might be questioned. The snow module in the

SCHEME model comprises a conceptual store by which snow is accumulating or melting according a simplified energy balance. The pattern of the snow in the central zone of the basin is in this case controlled mainly by the precipitation during the 17th and the night, as well as negative temperature. The limit of the detection by H10 corresponds in this case to a threshold of roughly 2 mm snow water equivalent by the model.



Left: H01 (snow detection; snow in white, clouds in grey and land is in dark grey) over the Southern Belgium and Luxemburg; the contour of the domain of the SCHEME hydrological model applied to the Meuse basin (down to the border with the Netherlands) is also represented. Right: snow water equivalent (scale 0 to 8 mm; dark corresponds to more snow!) simulated with SCHEME over the Meuse basin

CONCLUSION

This case study is one rare occasion when the limit between snow covered and snow free area can be observed on the product on a distance of about 150 km over Belgium and around. The delineation is consistent with snow reported at the synoptic stations and also with snow as simulated with a hydrological model