



## **Analyzing the spatial and temporal properties of precipitation above the Ourthe catchment and its influence on the flood response**

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In the year 2001 the Royal Meteorological Institute of Belgium (KMI) installed a C-band Doppler radar in the southern Ardennes region in Belgium near the border of Luxembourg at an elevation of 600 m. The 1597 km<sup>2</sup> Ourthe catchment lies within 50 km of this radar. As one of the bigger sub-catchments, this tributary forms an important input to the flood response of the river Meuse before it enters the Netherlands. So far, runoff response during extreme discharges have been difficult to simulate using only rain gauge data.

To assess the potential of the space-time structure of rainfall estimated using the radar for runoff modeling a collaboration between the Hydrological Service of the Walloon Region of Belgium (MET-SETHY), the KMI and Wageningen University was started. Ten rain gauges more or less equally distributed over the watershed measuring at an hourly interval are used to validate the radar. Near the outlet discharges are collected at the same time step.

A previous study (Berne et al., 2005) presented the first results of the radar application for six rainfall events. Basin average rainfall values were used as an input to the conceptual HBV model during a stratiform and convective event. Results showed that predicted discharges were highly dependent on initial conditions.

To diminish these effects, in this study the spatial and temporal characteristics of rainstorms and the resulting runoff response is being assessed over the period October 1, 2002 until March 31, 2003. During this winter half year storm events were mainly stratiform resulting in four important runoff peaks. First analyses show good correspondence between radar and rain gauge data. Most storm periods cover only a fraction of the basin. To quantify the hydrological relevance of the high spatial resolution of the radar as compared to the gauge data, both a lumped and distributed model are utilized.

#### References

Berne, A., M. ten Heggeler, R. Uijlenhoet, L. Delobbe, Ph. Dierickx, and M. de Wit, 2005,

A preliminary investigation of radar rainfall estimation in the Ardennes region and a first hydrological application for the Ourthe catchment. *Natural Hazards and Earth System Sciences*, 5, 267-274