



## **Areal precipitation over Central and Northern Europe estimated from weather radar data**

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### **1 Introduction**

To improve Numerical Weather Prediction (NWP) models the EU-funded project EL-DAS (Development of an European Land Data Assimilation Systems to predict floods and droughts) has been carried out [1]. Within this framework continental-scale 3-hourly precipitation fields have been analysed from operational radar data calibrated with a high density rain gauges network. Here we focus on the application of radar data for quantitative precipitation estimation, the impact of input radar data quality on the analysis result and the analysis algorithm.

### **2 Data and method**

For this purpose the two European radar networks BALTRAD (Baltex weather radar network) and CERAD (Central european weather radar network) have been combined. The BALTRAD network consists of 31 radar sites in 6 countries along the Baltic Sea. On the other hand the CERAD network is composed of 41 radar sites in 11 countries. Both datasets comprise some shortcomings, which result in a difference between ground measurements and the radar estimates of precipitation. Due to this radar-specific uncertainties like ground clutter, inhomogeneous calibration and other errors a semi-automatic algorithm has been developed. This algorithm is based on a method of multi-temporal objective image processing [2].

### 3 Results

The quality of radar derived precipitation fields has been estimated by comparison with gauge analysis at the spatiotemporal scale of the ELDAS grid (0.2 degree daily) for the entire ELDAS period Oct. 1999 to Dec. 2000. While in the CERAD domain the radar precipitation is overestimated on average by 0.22 mm/day, BALTRAD is underestimated about 1.64 mm/day. Additionally, statistics on the availability of CERAD and BALTRAD data for the period have been compiled. While in BALTRAD approximately 0.16 % of the data are missing, about 14 % are missing in CERAD. This is a limitation for operational application in NWP. The final precipitation product is based on disaggregated daily objective analysed rain gauge data using the 3-hourly accumulated CERAD and BALTRAD analyses [3]. These fields are stored in GRIB format and are available via ECWMF MARS archive.

### References

- [1] Van den Hurk B., 2002: European LDAS established. - GEWEX News, 12/2, 9-9. <http://www.gewex.org/>.
- [2] Brugger, K., 2004: Areal precipitation over Central and Northern Europe estimated from weather radar data (in German). - Master Thesis, Institute of Meteorology and Geophysics, University of Vienna, 97pp.
- [3] Skomorowski, P., M. Kotteck, K. Brugger and F. Rubel, 2005: Precipitation fields for soil-moisture determination in ELDAS, abstract submitted to EGU 2005.