

Developments in the DWD radarnetwork

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1 Introduction

Considerable progress has been achieved for the radar network of the German Meteorological Service within the last two years. Some highlights are briefly reported here.

2 Network hardware status

LOG-only radars have been dopplerized by digital receivers offering now improved clutter suppression capabilities (to be seen in Fig. 1) as well as Doppler wind data for all radars.

3 Software development

Under the RADRUM project (RADaR Unix Migration), a new Linux-based software was created, which will be operational within this year. It will be possible to create new high quality products or more flexible scan strategies according to user requirements.

4 Gauge adjustment procedure

Gauge adjustment has been effected by an offline procedure on a case-to-case basis in the past. This procedure is being transferred into real-time application within the RADOLAN project (routine procedure for an online calibration of radar precipitation data by means of automatic surface rain gauges/ombrometers), which is sponsored by the Länderarbeitsgemeinschaft Wasser (LAWA).

Therefore some fundamental steps in the development with a gradual shortening of the measuring interval for precipitation from day to hour up to short-term intervals of less than an hour are necessary.

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5 Wind turbine effects

Wind parks are becoming an increasing problem in Germany. For instance, the radar at Flechtdorf (Fig. 2) had to be moved due to wind turbines in the surrounding area. This provokes the idea that meteorological services should discuss a common strategy how to strengthen the lobby for remote sensing instruments used for weather observation and forecast.

The new radar tower with the moved radar is shown on Fig. 3. The place of the new tower is about 4 km away from the old place. The new tower is 72,25 m high.

Figures 4 and 5 are showing the possibilities with clutter from wind turbines. It is not possible to eliminate every clutter made by wind turbines.

6 CONRAD cell tracking algorithm

The DWD warning and cell tracking tool CONRAD (CONvection in RADar, Lang, 2001) had been created to identify, evaluate and track convective cells, and produce warnings for hail, wind and severe local rainfall. So far, it has been a single radar product based on one standard intensity product available every 5 min.

Lately, a composite has been generated offering the possibility to track cells beyond the scope of one radar. An example is shown in Fig. 6.

7 Quality management and ISO-2001 certification

In April 2004 the DWD achieved the ISO-2001 certification for the strategic process data advertisement and data management. The radarnetwork is one process in the “full automatically dataprocessing systems”. This is an actual highlight of many improvements since the german radarnetwork exists.

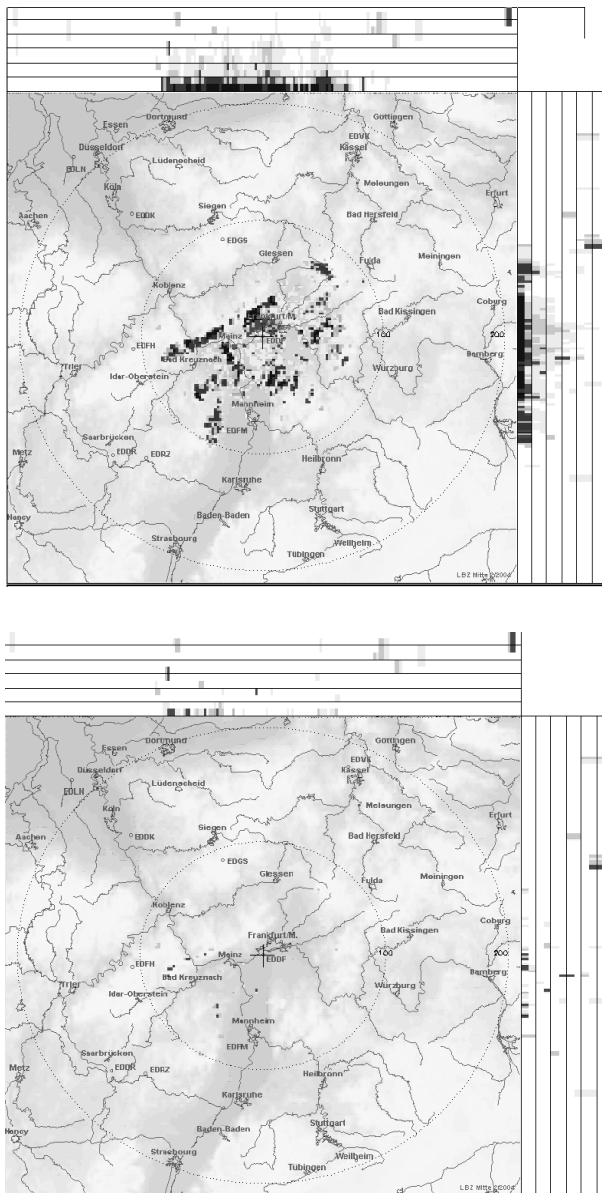


Fig. 1. Local picture from radar Frankfurt without and with Doppler filter.

8 Future Plans

Within the “NEUWERG” project planned for 2004–2009, the five oldest DWD radars, in operation now for up to 18 years, will be replaced. The research radar at the Hohenpeissenberg observatory is being upgraded for dual polarisation (DualPol project). It will be tested whether a polarized radar can be operated under a radom and whether algorithms are robust enough for operational service. A novel, cost-effective set-up has been designed in co-operation with potential manufacturers that may become standard for the next generation radars.

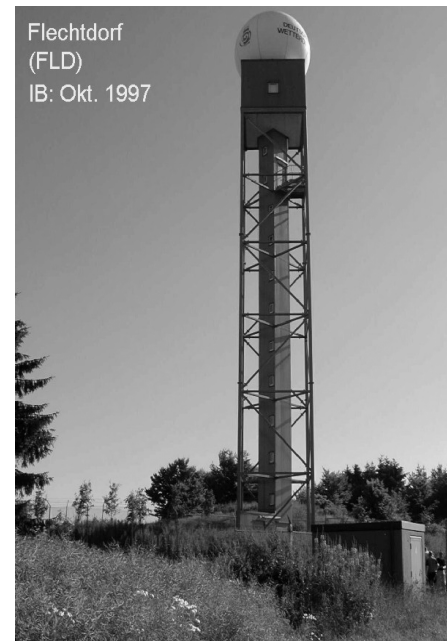


Fig. 2. Old radar tower in Flechtdorf.



Fig. 3. New radar tower in Flechtdorf.

References

- Lang, P.: Cell Tracking and Warning Indicators derived from operational Radar Products, AMS Radar Conference, 2001.

