

Interactive comment on “Performance of high-resolution X-band weather radar networks – the PATTERN example” by K. Lengfeld et al.

K. Lengfeld et al.

katharina.lengfeld@zmaw.de

Received and published: 31 October 2014

Interactive comment on “Performance of high-resolution X-band weather radar networks –the PATTERN example” by K. Lengfeld et al.

T.C. Mammen (Referee) theodor.mammen@dwd.de Received and published: 2 October 2014

Reviewer Comment: The described technique of combining this type of radars is promising in getting more detailed precipitation structures compared to large network C-Band radars. The comparison with the Hamburg-C-Band-Network-Radar shows, that the technology and the methods used basically work. The wording of the text could be improved to support the understanding:

C3403

Basic Principle: When looking at data from this type of LAWR in comparison to C-Band Network-Radars the main difference in data acquisition should be kept in mind: Network Radar: a range bin is acquired as a "snapshot" of about 40 Pulses, i.e. in about 50 ms. LAWR: the data for a bin is assembled as "long time exposure (compared to network-radar)" since pulsedata are averaged over about 12 sweeps and 30 seconds. This major difference should also be kept in mind, when looking at signatures from other radars at the same frequency: they may be quite different between the two types.

Author's Reply: We thank T.C. Mammen for his helpful comments. Yes, indeed, the temporal average over the measuring period as it is performed by the X-band radar is another benefit compared to C-band radar. We implemented a short description of this principle in section “Radar Network”.

Reviewer Comment: Clutter: Since the bins that are identified as clutter are rejected and never corrected for clutter power, this is usually called "Thresholding".

Author's Reply: The reviewer is right. In the revised manuscript we took this into account and described the procedure for rejecting clutter bins and filling the produced data gaps in more detail.

Reviewer Comment: Calibration: The described method with gage and MRR is very good approach and the comparison LAWR - Hamburg radar proves this to significant extent. Anyway it would be helpful to verify the calibration by using a calibrated external source (Test-Signal-Generator with standard gain horn).

Author's Reply: Yes, verifying the calibration with an external source would be beneficial. But the MRRs used for calibrating the X-band radars are calibrated by the manufacturer and adjusted to rain gauge measurements and, therefore, serve as reliable reference.

Reviewer Comment: Noise measurement: The low PRF of 800 Hz gives the opportunity to use range bins far away (>150km) to make continuous noise measurements in

C3404

addition to the described method.

Author's Reply: In principal this is a good method to continuously measure noise. However, our system is not able to process data fast enough to get unambiguous measurements from distances as far as 150 km with 800 Hz. Therefore, we cannot apply those kinds of noise measurements.

Reviewer Comment: Beyond this article it will be nice to see the development of this technique.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 8233, 2014.