

New Quality Assurance Algorithms for the DWD Polarimetric C-Band Weather Radar Network

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In 2010 Deutscher Wetterdienst (DWD) has started the exchange of the existing Doppler C-Band weather radar network with 17 dual-polarimetric radars. Beside the enhancement of the measurement capabilities, the new systems imply a redesign and a further development of the existing quality assurance algorithms. The operational radar quality control schemes used up to now for the Doppler radars are realized in a software package called RADARQS. Efficient methods for the detection of spokes and rings, clutter, second trip, aliasing, as well as different corrupt image phenomena in the reflectivity and radial velocity measurements are included. For each reflectivity and radial velocity sweep a separate quality product is created. These products encode for every range bin the detected quality phenomena in a set of quality bits.

As a consistent advancement, currently, improved versions of the existing quality control algorithms are developed using the new dual-polarimetric measurements. Moreover, the present algorithm chain is complemented by new techniques for the detection of the bright band and for attenuation correction. The results obtained from these new methods are also included in the quality products. The implementation of the algorithms represents one building block of the new software framework POLARA (Polarimetric Radar Algorithms) developed at DWD.

In this paper, the focus is laid on the realization of the new methods for bright band detection, attenuation correction, and clutter detection based on dual-polarimetric measurements. Furthermore, we present results of these schemes applied to characteristic weather cases.