

13.28 GROUND ECHO REMOVAL EMPLOYING DUAL-POL C-BAND RADARS IN THE NETHERLANDS:

A. OVEREEM^{1,2}, R. UIJLENHOET², H. LEIJNSE¹

¹ R&D Observations & Data Technology, Royal Netherlands Meteorological Institute,
the Netherlands

² Hydrology and Quantitative Water Management Group, Wageningen University, the
Netherlands
overeem@knmi.nl

Since January 2017, the Royal Netherlands Meteorological Institute (KNMI) operates two new dual-polarization C-band weather radars in STAR mode. Data from these radars are composited to obtain operational 2-D rainfall products for the Netherlands. These products are extensively used for e.g. nowcasting, water management, and climatological purposes.

Despite the application of Doppler filtering, remaining ground echoes due to anomalous propagation still pose a problem. Moreover, remaining sea echoes can be abundant. This calls for additional filtering algorithms.

The polarimetric radars offer new opportunities for ground clutter removal. Here we explore the use of the correlation coefficient to discriminate weather from non-weather echoes by simply applying a threshold value. In addition, we employ an existing method to estimate the depolarization ratio from the correlation coefficient and the differential reflectivity. Since high depolarization points to non-weather echoes, depolarization ratios above a certain threshold value will be filtered, resulting in zero precipitation estimates. For both methods a sensitivity analysis will be carried out to find optimal threshold values for these C-band radars in a temperate climate.

The verification will focus on the presence of remaining ground echoes for at least a few case studies with severe ground clutter, not only including non-rainy cases. This is achieved by mapping the number of exceedances of radar reflectivity factors for given thresholds. Moreover, accumulated rainfall maps will be obtained to detect radar pixels with unrealistically large rainfall depths. The results from both methods will be compared, and also contrasted to the results for which no method has been applied.