

Authors

Reinhard Teschl, Graz University of Technology,
Helmut Paulitsch, Graz University of Technology,
Franz Teschl, Graz University of Technolog,

In recent years, a number of papers were presented (also at ERAD) that showed the effects of wind turbines in radar data. The rotor blades of wind turbines that extend into the radar beam cause unwanted echoes that cannot be removed by Doppler filters, as they are normally rotating. In addition, the wind turbines are obstacles that can shield parts of radar beam. Moreover, because of side lobe effects of the radar beam, also objects that are not in the focus of the radar (but produce high backscatter) can lead to incorrectly placed echoes. Thus, a wind farm may cause echoes beyond its geographic position and thus effect radar data.

Recently, EUMETNET OPERA has initiated studies to update its current guidelines and to find profound arguments for ensuring wind turbine free areas around radar sites. The present study makes a contribution to this effort by investigating the spatial extend of the effect of wind turbines on weather radar data. One of the selected study areas is a wind farm near Delfzijl in the Netherlands. Between the wind farm and the radar site in Emden, Germany, no other wind turbines are located (as of the two-year period of investigation from November 2010 to October 2012). The general approach was to categorize the radar coordinates according to their relative location and distance to the coordinates of the wind farm. The coordinates in front, behind, and at the side (as seen from the radar) of the wind park were separately analyzed. The mean reflectivity as well as the distribution of the measurements were investigated during different weather conditions.

First results indicate that especially coordinates at the side seem to be influenced by wind turbines located at neighboring coordinates since the comparison of the reflectivity distribution at wind turbine coordinates and those separated laterally only by 1° (as seen from the radar) shows similarities.