

## **The effect of a wind power plant in radar data**

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There are a number of efforts underway to mitigate effects of wind power plants on weather radar measurements. Wind mills may bias radar data such that severe weather warning algorithms may produce erroneous diagnostics of the existing weather situation, or that a forecaster may have difficulties to interpret the radar data properly. The biggest issue here is that classic Doppler clutter filters do not work if the target is moving, such as it is the case for a wind mill.

The signature of a wind mill in the radar data depends on a number of conditions:

- operation mode of the wind mill
- wind direction and speed
- radiation propagation conditions
- weather conditions, i.e ice accretion on the blades.

All these conditions lead to the fact that the signature of a wind mill in radar data is expected to be heterogeneous.

With the introduction of polarimetric weather radars the question arises to what extent wind mills affect polarimetric moments. In order to quantify this effect a dedicated scan was set up at the radar Boostedt in December 2013. Every hour, this scan points for a couple of seconds at a wind mill and records data. The wind mill is located about 8 km from the radar. The scan itself is then followed by a reference scan with the same configuration, but pointing off the wind mill. This data together with fix clutter target data are analysed in order to quantify the effect of a wind mill on a statistical basis. An optical disdrometer and a wind measurement at the radar site is used to break down the analysis with respect to wind speed and direction, rain rate and precipitation type.