Effects of wind turbines on the use of meteorological radar based products

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The use of radar products and radar based algorithms is very important for weather prediction tasks, especially in nowcasting, and for early warnings in the context of flight and emergency management. Strong efforts have been undertaken in the last years to develop, optimise, and expand the use of radar data.

At the same time, a change in the concepts of energy production has taken place. The planned and successive exit from nuclear and fossil-fuel energy production is a political objective in Europe. Regenerative energy has become a major player in the field of energy production, especially in Germany, and wind energy is playing a key role.

These two developments are happening in parallel but not independently. The disturbances in meteorological products due to rotating wind turbines do not agree with the progressing product development, increase in data resolution and the expanding expectations in accurateness, availability and reliability. In fact, the disturbances affect the quality of the final meteorological products significantly.

The presentation will show various examples of wind turbine disturbances, e.g. of products which are in preoperational and operational use. In this regard, automatically generated warning products are very important. In emergency situations, e.g. when a large number of convective cells at a cold front or convergence line cross the country, immediate action has to be taken under real-time conditions. In these situations, the effects of wind turbines are most critical.