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# Use of a radar beam propagation model to improve radar data quality

**G. Haase** (1), U. Gjertsen (2) and J. Bech (3)

(1) Swedish Meteorological and Hydrological Institute (gunther.haase@smhi.se, Fax: +46 - 11 4958001), (2) Norwegian Meteorological Institute, (3) Meteorological Service of Catalonia

The quantification and characterization of uncertainty in weather radar measurements have become more and more important during the recent years. Both issues are covered by the COST concerted research action 731 (Propagation of uncertainty in advanced meteo-hydrological forecast systems) started in 2005. Within the framework of the NORDMET Activity on Radar Applications (NORA) a beam propagation model (BPM) has been applied to correct topographical beam blockages and to assess potential radar locations.

The BPM simulates the radar's field of view considering the scan geometry, the topography, and the atmospheric conditions. Topography is described by a digital terrain model with 1 km horizontal resolution. Atmospheric profiles are either based on standard conditions, radiosoundings or NWP forecasts. BPM output fields are e.g. the degree of blockage and the corresponding correction factors which can be applied to operational radar reflectivity products. We will show results for different case studies where the BPM has been applied to radars of the Nordic Weather Radar Network (NORDRAD). Beam blockage correction for standard propagation reduces the gauge-radar scatter and bias in average. An implementation of the correction matrices into the operational NORDRAD system is planned for this year. Forecasts of the High Resolution Limited Area Model (HIRLAM) seem to be useful for identifying anomalous propagation at least for the cases investigated.

The NORDRAD radar on the Swedish island of Gotland has to be relocated because the agricultural silo on which the radar is currently placed will be destroyed in summer 2007. An extensive inquiry of potential radar sites has been finalized recently. Beside legal prerequisites and infrastructural needs, data quality was included in the

overall assessment. We will present BPM experiments with standard and anomalous propagation conditions and will explain how the results support the decision-making process.