Quality Assessment of Radial Velocity Data using Wind Profiles

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Radial velocity data from volumetric radar scans are of great interest to high-resolution numerical weather prediction (NWP) models. First demonstrations of the positive impact of these radar data on the forecasted wind and temperature fields using 3DVAR assimilation were given more than a decade ago (e.g. M. Lindskog et al, 2004, Mon. Wea. Rev.). The European OPERA (Operational Program for Exchange of Radar Information) program is starting the international exchange of volumetric radial velocity data (E. Saltikoff et al, 2014, BAMS). Vast amounts of radial velocity data will thus become available to the modeling community. However, these volumetric data have not been evaluated yet other than by comparing them against model fields.

Here we present a novel method to assess the quality of radial velocity data from volumetric radar scans. It has been demonstrated before that, when using a proper algorithm and the correct settings, weather radars can produce wind profiles with a quality similar to those of radiosondes and NWP models. The basic idea behind our method is to reference radial velocity data from weather radar 1 against wind profiles from weather radar 2. For this, the radial velocity data of radar 1 above the location of radar 2 are compared to the line-of-sight component of the wind profiles of radar 2 towards radar 1. On the poster we will show preliminary results on the quality of the radial velocity data for various scan settings, the impact of applying a dealiasing routine, and the spatial scale dependence of the radial velocity data quality.