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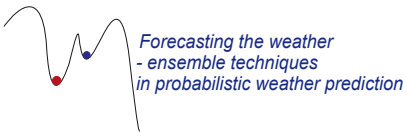

Operational Application of VERA-QC, Challenges and how to cope with them

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At the Department of Meteorology and Geophysics at the University of Vienna an operational analysis system called VERA (Vienna Enhanced Resolution Analysis) is carried out with synoptic data on an hourly basis. It is also used at the Austrian Aeronautical Meteorology Service for nowcasting purposes which makes a high accuracy regarding the analysis algorithm but also regarding the quality control (QC) of the measurements indispensable. Another area of research at the department concerns the model validation which also requires data of a high quality.

Most of the common QC methods are not suited for these applications either because of their dependency on model information (e.g. optimum interpolation QC, Bayesian or variational QC) or because of their insufficient performance in complex and inhomogenous terrain (e.g. QC using inverse distance or spatial regression interpolation).

For this reason we developed VERA-QC which makes use of the spatial and temporal consistency of the meteorological parameters. The mathematical formalism and the advantages in comparison to other QC methods are presented in the contribution at this conference titled ”VERA-QC, a new Data Quality Control based on Self-Consistency”.

The aim of this presentation is to discuss the experiences we made with the operational execution of a two dimensional VERA-QC covering a European domain. For more than a year the main meteorological parameters MSL pressure, potential and equivalent potential temperature and wind speed have been checked for their quality and the computed deviations have been collected. It will be discussed that the application of VERA-QC to real data in a complex terrain implicates certain difficulties. For example a QC must not correct differences in observations that arise from varying station heights. Apart from the common procedure to control parameters reduced to a standard level we will present the possibility to check the departures from the corresponding values of the standard atmosphere and also the evaluation of its performance. Additionally we will show how known physically low correlations between adjacent stations at different heights can be combined in a station selecting algorithm. This procedure helps for example to decrease the cases in which values taken over and below an inversion are compared to each other.

Furthermore the collected deviations are evaluated statistically and it will be shown how they help to improve the gross error recognition and allow to compute a bias correction for the handling of systematic errors. It will be mentioned that VERA-QC is also suited for the QC of meteorological real time three dimensional data as it was used at the field study COPS. As a concluding remark it will be presented how the originally intended application of VERA-QC (correction of synoptical observations) has been extended to other application areas such as the homogenization of time series or the creation of ensemble analysis.