Geophysical Research Abstracts, Vol. 8, 02781, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02781

The concept for a new error score "SAL" for the verification of high-resolution precipitation forecasts

H. Wernli (1), M. Paulat (1) and C. Frei (2)

(1) Institute for Atmospheric Physics, University of Mainz, Germany; (2) MeteoSwiss, Zürich, Switzerland (wernli@uni-mainz.de)

Current regional NWP models produce precipitation forecasts with high spatial and temporal resolution (<10 km, 1 hour), frequently showing pronounced small-scale structures (e.g. individual convective cells, narrow rainbands, convective systems). The tendency towards finer-scale details in precipitation forecast will increase with the advent of cloud-resolving models with even higher resolution and without parameterized deep convection. Conventional grid-point based verification techniques do not provide a meaningful guidance when assessing the quality of a precipitation forecast from high-resolution models integrated over a short (1-6 hours) time period. Therefore, several novel approaches for QPF verification are currently developed that identify distinct precipitation objects, associate the objects found in the observations with those from the model and quantify the errors in the prediction of these features. However, in the presence of several small-scale precipitation cells, it becomes almost impossible to link individual objects in the observations and model forecast.

In this study an alternative approach is suggested, that on the one hand considers the general structure of finite precipitation objects both in the observations and model forecast, but on the other hand is independent from a direct linking of objects in the two fields. The novel quality measure (or error score) is termed SAL. It separately considers aspects of the structure, amplitude and location of a precipitation forecast in a certain region of interest, for instance a major river catchment. This three-parameter error scores aims at addressing the following issues: (i) It measures quantitatively the quality of an individual precipitation field in a previously specified area, forecast by a NWP model and integrated over relatively short time periods of typically 1-6 hours. (ii) It is close to a subjective visual judgment of the accuracy of a regional precipitation forecast. (iii) It takes into account the structure of the precipitation event (e.g. scattered

convective cells, convective complex, frontal rain system) that is regarded as a direct fingerprint of the meteorological nature of the event. (iv) Its three components are independent.

To accomplish these tasks, simple measures are specified for the aspects of amplitude and location (domain averaged precipitation and specification of center of mass). The structure component S is calculated as the averaged volume of the normalized precipitation objects. Defined in such a way, S is able to distinguish between large and small, as well as flat and peaked objects. SAL is currently implemented in order to gain experience with the concept and evaluate the performance of the operational German mesoscale NWP model.