Geophysical Research Abstracts,
Vol. 11, EGU2009-4387, 2009
EGU General Assembly 2009

The estimation of QPF uncertainty on the basis of QPF spread

P. Zacharov and D. Řezáčová
Institute of Atmospheric Physics ASCR, Dept. of Meteorology, Prague, Czech Republic (petas@ufa.cas.cz)

In this presentation we summarize the latest results of the COSMO model application to the QPF related to local heavy convective rainfalls. Several convective storms, which occurred over the Czech territory and caused local flooding, were studied by using COSMO model in experimental mode. A driving COSMO (LLM) was run with the horizontal resolution of 11 km and with initial and boundary conditions derived from ECMWF analyses. The driven COSMO (SLM) used the horizontal resolution of 2.8 km and the initial and lateral data from LLM. The integration started at 0600UTC and finished at 2400UTC of the same day. The events produced the convective precipitation fields of various area extents and structures identified by radar. Multicellular storms with a repeated cell development over a given locality are the most common storm type. In various stages of the work we focused on several aspects of the accuracy of high resolution QPF.
Several heavy convective events, which occurred at the territory of the Czech Republic, have been analyzed in an ensemble forecast regime. The ensemble of 13 members has been formed by linear shifting the initial fields in 8 directions. We have analyzed differences among the QPF of ensemble members by using several scores and especially, we have focused on the relationship between ensemble spread and ensemble skill. The ensemble has been evaluated by comparing the ensemble member forecasts with radar-based rainfalls. The effect of scale has been assessed by considering squares of various sizes that are centred in grid points of the verification domain. The ensemble spread and skill have been calculated by using Fractions Skill Score. A scale dependence of spread and skill was analyzed at different times of integration and for various rainfall thresholds.
In this paper, we focus on estimating ensemble skill on the basis of ensemble spread. The numerical experiments used the FSS-based skill and spread values related to N events to estimate the skill-spread relationship. The relationship was applied to the N+1 event to estimate the QPF ensemble skill given the ensemble FSS-based spread. We performed the evaluation separately for 1, 3, and 6 h rainfalls and we used various threshold values and scales.
The work is supported by the project OC112 (COST731) and by the grant GA CR 205/07/0905.