Verification of the QPF for severe local storms vs heavy stratiform rains

Petr Zacharov and Daniela Rezacova

Institute of Atmospheric Physics CAS, Dept. of Meteorology, Prague, Czech Republic (petas@ufa.cas.cz)

Results of the verification of Quantitative Precipitation Forecast (QPF) by spatial FSS techniques are presented. The QPF of 3h rainfalls was produced by the NWP model ALADIN CZ, operated with the horizontal resolution of 4.71 km in the Czech Hydro-meteorological institute (CHMI). The CHMI operational product MERGE, which merges the radar-based rain rate with the data from the gauge stations, was the source of the verification data. The verified set covers the three summer periods from 2013, 2015, and 2016. The forecasts with a leading time up to 54h include local convective storms and heavy rainfalls from stratiform clouds as well. The verification domain covers the territory of the Czech Republic.

The verification uses the FSS (Fraction Skill Score) approach with various values of the precipitation threshold and with various size of elementary areas (area windows). The whole set of forecast is characterized by the fraction of useful forecasts (FSS > FSSuniform) together with the mean and aggregated FSS values. We compare the verification results for 5 classes, which are defined by mean and maximum 3h rainfalls over the verification domain, specifically the classes of heavy precipitation from convective storms and from stratiform cloudiness. In addition to diagnostic global parameter we study the stratification according the prognostic values of global parameters and according the parameters resulting from the statistical relationship between the diagnostic and prognostic parameter values. The work aims at testing the hypothesis that the QPF uncertainty can be estimated by verification based on prognostic parameters i.e. in the forecast time when the precipitation data are not available yet.