



Forecasting Extreme Convective Phenomena with Ensemble Prediction System Results

Grzegorz Duniec and Andrzej Mazur

Institute of Meteorology and Water Management - National Research Institute, Department of Numerical Weather Forecasts
COSMO, Warsaw, Poland (grzegorz.duniec@imgw.pl)

A relatively simple method of forecasting extreme convective phenomena, using results of Ensemble Prediction System has been proposed. This method uses Universal Tornadoic Index as an indicator of the occurrence of a convective phenomenon. Since it utilizes many factors (CAPE, storm relative helicity, convective precipitation, wind shear etc.) – it can be useful in forecasting not only tornadoes, but also thunderstorms or squalls. The application of the EPS in convection-permitting scale allows to improve these forecasts, especially due to the removal of false alarms. The research was carried out using archive data, starting from 2015. The noteworthy correlation between significantly higher UTI values (ensemble means) and occurrence of thunderstorms was established in this research.

Another phenomena forecasted with Direct Model Output of EPS-system were visibility range (verified against measurements at Polish SYNOP stations) and lightning rate (occurrence of thunderstorms) calculated from DMO and verified vs. measurements at Polish lightning detection network "PERUN".

In the study various types of perturbations (perturbations of soil-related parameters, analysis fields and/or precipitation-related parameters) have been applied to assess which would generate the best forecasts of convection phenomena.