



## **Ensemble Forecasting of Extreme Convective Phenomena Using Universal Tornadoic Index**

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In the Institute of Meteorology and Water Management – National Research Institute a relatively simple yet effective method of forecasting extreme convective phenomena, using Ensemble Prediction System (EPS) predictions, has been proposed. This method uses so called Universal Tornadoic Index (UTI) as an indicator of the occurrence of a convective phenomenon. Special attention has been paid to case-study of tornado over central Poland occurred 14th July, 2012, using EPS with time-lagged boundary and initial conditions to calculate UTI. Since this index utilizes many factors (CAPE, storm relative helicity, wind shear at two levels, convective precipitation, etc.) – it is assumed that it may be useful in forecasting not only tornadoes, but also other convective phenomena like thunderstorms or squalls. An example of such phenomenon that can be forecasted with UTI is lightning rate (i.e. occurrence of thunderstorms) that is in an operational mode calculated from direct model output and verified vs. measurements at Polish lightning detection network "PERUN". 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 2012. The noteworthy correlation between significantly higher UTI values (ensemble means) and occurrence of thunderstorms was established in this research.