

ABSTRACT

UTILIZATION OF ANALYSIS OF THE SPATIAL RELATIONSHIPS BETWEEN METEOROLOGICAL VARIABLES IN DATA ASSIMILATION INTO A NUMERICAL WEATHER PREDICTION MODEL

Quality of initial conditions has a big impact on the accuracy of numerical forecast. The aim of the preparation of the initial conditions is to modify the first guess of the atmospheric state based on the observed data of the meteorological variables so it fit the actual atmospheric state. At present these conditions are usually prepared by objective analysis or by assimilating measured data into model fields. One of the method of the data assimilation is a 3D variational method (3D VAR). It prepares the initial model conditions so that the model fields correspond to actual measured values, while maintaining the spatial relationships between the values of model variables. By utulising the spatial relationships we can improve the initial conditions and so the forecast.

In this work we concentrate on study of the spatial relationship in the convective storms based on correlation analysis of the model variables. We used the model data from COSMO model with horizontal resolution 2.8 km, which were describing 152 convective storms in all the vertical levels. The analysis proved stornng relationship between vertical speed, vertical speed and air temperature, vertical speed and mixing ratio of water vapour, air temperature and mixing ratio of water vapour, vertical speed and mixing ratio of cloud water. Other repationships were less strong but not insignificant.

Key words: 3D-VAR, correlation analysis, data assimilation, meteorological data analysis, numerical weather forecast