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Dependence of the convective precipitation forecasts from details of the land-surface model

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ICM is testing few land-surface sub-models coupled into mesoscale numerical prediction models running quasi-operationally at the University of Warsaw. In the research version of the mesoscale NWP model COAMPS the land-surface model NOAH is implemented, in UKMO Unified Model some versions of MOSES schemes are tested. Results of precipitation forecasts obtained from different sets of land-surface parameters are compared to our operational versions of both models. Validation of the model results was performed using object oriented approach - contiguous rain area (CRA) method. CRA is defined as a region bounded by selected rain rate contour in the forecast and in the observations. The location error is determined using the pattern matching technique. The forecast field is horizontally translated over the observed field until the best match is obtained. The location error is then simply the vector displacement of the forecast. All precipitation forecasts were verified against radar observations collected from radars operated in the area of Baltic Sea catchment. Primary radar observations used in our study consist of 15 minutes reflectivity data on 500 m CAPPI level. These data are integrated into 1h and 15 minutes precipitation accumulations using standard Z-R relationship. Land-surface models have large number of parameters. For example, the NOAH LSM has 33 parameters: 10 related to the vegetation, and 23 that describe soil properties. The main purpose of this study was to evaluate the changes in precipitation patters as a function of the land-surface scheme used and the preferred values of main parameters of the scheme. The impact of the features of land-surface models on the quality of the convective precipitation forecasts has been tested on selected cases.