

Impact of soil-moisture initialisation on the quality of COSMO-LEPS forecasts

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In this work, we test different approaches to initialise the soil fields of COSMO-LEPS, the Limited-area Ensemble Prediction System developed in the framework of the COnsortium for Small-scale MOdelling.

It is assessed the impact of the different initialisations on the quality of short-range forecasts provided by the system during winter and spring 2011.

The performance of COSMO-LEPS is investigated for the prediction of near-surface variables, including 2-metre temperature, 2-metre dew-point temperature and total precipitation.

In addition to that, the skill of COSMO-LEPS for the probabilistic prediction of precipitation is assessed in terms of time-series scores from 2002 onwards, by selecting a fixed number of SYNOP stations and comparing direct observations against short and early-medium-range forecasts. The different system upgrades are found to impact positively on COSMO-LEPS performance, with a gain of about two days of predictability in the last four years of operational forecasts.

Modifications to the present clustering-selection technique are also tested, with attention to their impact on the spread/skill relation of the system for surface and upper-air variables.

Finally, the main stream of development for COSMO-LEPS system are discussed with future possible upgrades and methodology modifications.