



Activity in the field of mesoscale ensemble forecasting by the COSMO-LEPS system: main achievements and open challenges

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In this work, the main characteristics of COSMO-LEPS, the Limited-area Ensemble Prediction System developed in the framework of the COnsortium for Small-scale MOdelling, are presented. The present status of the system is shown with the description of the methodology and of the main upgrades which took place during its years of activity. The performance of COSMO-LEPS for the probabilistic prediction of precipitation is assessed in terms of both time-series and seasonal scores over a 7-year period. A fixed number of stations is selected and observations are compared to short and early-medium-range forecasts. Different verification indices are used to assess the skill of COSMO-LEPS and to identify the impact of system modifications on forecast skill.

The different system upgrades are found to impact positively on COSMO-LEPS performance, with a gain of two days of predictability in the last four years of operational forecasts. This holds when the skill of the system is assessed both for single events (e.g. precipitation surpassing a fixed threshold) and for multi-event situations.

Scores for fixed forecast ranges but varying thresholds confirm increasingly better performance of the system.

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