

Improving weather forecasts by estimating model parameters with data assimilation

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Abstract:

We investigate the feasibility of addressing model error by perturbing and estimating uncertain static model parameters using an Ensemble Kalman Filter (EnKF). In particular we use the augmented state approach, where parameters are updated by observations via their correlation with observed state variables. This online approach offers a flexible, yet consistent way to better fit model variables affected by the chosen parameters to observations, while ensuring feasible model states. We show in a nearly-operational convection-permitting configuration that the prediction of clouds and precipitation with the COSMO-DE model is improved if the two dimensional roughness length parameter is estimated with the augmented state approach.