*Forecasting the weather
- ensemble techniques
in probabilistic weather prediction*

LETKF for the nonhydrostatic model COSMO-DE

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We report on first experiments with the Local Ensemble Transform Kalman Filter
(LETKF) for the nonhydrostatic COSMO-DE model of DWD.

The LETKF (Hunt et al., 2007) offers some very attractive features: it is a
simple algorithm, no tangent linear and adjoint versions of the prognostic
model are required, and the forecast error covariance matrix is cycled and
thus flow-dependent.

Experiments with deterministic as well as with ensemble boundary conditions (BC)
were performed. In the case with ensemble BCs we find an increased level of noise
(as measured by the surface pressure tendency) in the LETKF analysis. The
level of noise could be reduced by applying hydrostatic balancing to the
analysis increments.

Looking at the rmse/spread ratio of the first guess, we find the ensemble to
be underdispersive in both types of experiments, and adaptive algorithms to
increase the ensemble spread are tested.