

## Assimilating satellite radiances without vertical localization using the local ensemble transform Kalman filter with up to 1280 ensemble members

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Covariance localization plays an essential role in the ensemble Kalman filter (EnKF) to avoid bad influence of spurious covariance from sampling errors when the ensemble size is limited. In our previous study, we performed 10240-member ensemble data assimilation experiments with the global atmospheric model NICAM (Nonhydrostatic Icosahedral Atmospheric Model) to investigate horizontal and vertical error correlations. As a result, we found that roughly 1000 ensemble members would be large enough to avoid vertical covariance localization for satellite radiance data. In this study, we perform the Local Ensemble Transform Kalman Filter (LETKF) experiments with NICAM using the ensemble sizes from 20 to 1280. We compare the results with and without vertical localization for satellite radiance data.

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