

Séminaire Mercredi 22 Novembre 2017 11h TE / Seminar Wednesday November 22nd
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Sujet/Subject: Assimilation of hourly surface observations with the Canadian high resolution ensemble Kalman filter

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Langue/language : Anglais/English

Résumé/Abstract:

An hourly-cycling Ensemble Kalman Filter (EnKF) working at 2.5-km horizontal grid-spacing is implemented over the southern Ontario (Canada) area to assimilate Meteorological Terminal Aviation Routine Weather Report (METAR), in addition to the observations assimilated operationally at the Canadian Meteorological Centre. This high-resolution EnKF (HREnKF) system employs ensemble land analyses and perturbed roughness length in order to prevent too small ensemble spread near the surface. The HREnKF is then performed continuously for a four-day period, from which twelve-hour ensemble forecasts are launched every six hours. Special attention is put on the impact of assimilating METAR data on analyses and short-term forecasts.

It is shown that using ensemble land surface analyses increases near surface ensemble spreads for temperature and specific humidity. Perturbing roughness length enlarges the spread for surface wind. Given sufficient ensemble spread, the four-day-period case study shows that the near-surface model state is brought closer to the surface observations during the cycling process. The impact of assimilating surface data can also be seen at higher levels by verifications against aircraft reports. The ensemble forecast verification suggests that METAR data assimilation improves ensemble forecasts of air temperature and dewpoint near the surface up to lead-time of six hours or even longer. However, only minor improvement is found for surface wind forecasts.