Séminaire vendredi le 7 décembre 2018 11:00 / Seminar Friday December 7th 2018 11:00h

Sujet/Subject: Impact of AMSU-A Radiances in a Column Ensemble Kalman Filter

Langue/language   : Anglais et Français / English and French

Conférenciers/Lecturers: Herschel Mitchell (RPN-ARMA)

Résumé/Abstract
A column EnKF, based on the Canadian global EnKF and using the RTTOV radiative transfer model, is employed to investigate issues relating to the EnKF assimilation of Advanced Microwave Sounding Unit-A (AMSU-A) radiance measurements. Experiments are performed with large ensembles, with no localization. Three different descriptions of background temperature error are considered: (A) using analytical vertical modes and hypothetical spectra, (B) using the vertical modes and spectrum of a covariance matrix obtained from the global EnKF after two weeks of cycling, and (C) using the vertical modes and spectrum of the static background-error covariance matrix used to initiate a global data assimilation cycle.

It is found that the EnKF performs well in some of the experiments with background-error description A, and yields modest error reductions with background-error description C. However, the EnKF is virtually unable to reduce the error with background-error description B. To analyze these results, the different background-error descriptions are viewed through the prism of the radiative transfer model. Indeed, this comparison is found to explain the difference in the results obtained, which relates to the degree to which deep modes are, or are not, present in the different background-error covariances. The results suggest that, after two weeks of cycling, the global EnKF has virtually eliminated all background-error structures that can be ``seen'' by the AMSU-A radiances.

The implications of these results for the operational assimilation of AMSU-A radiances in the EnKF (and in the EnVar) will be discussed.