Séminaire Vendredi 22 Février 11h00 / Seminar Friday February 22, 11:00 AM

Conférencier/Lecturer: Pablo Grunmann

Sujet/Subject: An Improved Alternative Soil Moisture Variational Analysis Algorithm for CaLDAS

Présentation/Presentation: Anglais / English

Lieu/Room: Grande salle du premier étage CMC

Résumé/Abstract:

Land surface models (LSM), as part of Numerical Weather Prediction (NWP) models, are responsible for evolving in time the land surface state to provide bottom boundary conditions for the atmospheric model.

These models are sensitive to the initialization of soil variables such as soil temperature and humidity and the impact of these, among other consequences, affects the screen-level air temperature and humidity of the coupled LSM-Atmospheric system.

Currently, the part of the operational data assimilation system that corrects the soil temperature and moisture uses screen-level observations of air temperature and humidity to infer the corrections.

The Canadian Land Data Assimilation System project (CaLDAS), described in Balsamo's seminar of 12/12/2005, "balsamo-abstract.html" aims to improve on that with a simplified variational technique and by using more screen-level observations (extending over a period of time, thus capturing their diurnal cycle).

Tests revealed difficulties in achieving the expected improvements in the final result versus the operational system leading to a more careful study of CaLDAS behavior. This study led to the development of two diagnostic tools.

The results of these became the basis for an idea for an alternative technique for the soil moisture data assimilation part in place of the approach originally used in CaLDAS.

The first prototype came at the price of more calculations of the objective function with respect to CaLDAS, but not to an unreasonable degree (and having MEC-ISBA, the function is computed without having to run the full 3-D GEM).

Further improvements permitted additional reductions in the above computational cost.