

Séminaire vendredi le 19 juin 2015 11:00 / Seminar Friday June 19th 2015 11:00h

Sujet/Subject: On the improvement of stability of the Global Environmental Multiscale (GEM) model

Langue/language : Anglais/English

Conférencier/Lecturer: Syed Zahid Husain (RPN)

Résumé/Abstract:

Efforts are being made on a continuous basis at RPN to improve numerical stability of the GEM model while maintaining model accuracy. A recent development in this regard was to reorganize the thermodynamic and continuity equations to eliminate tendencies from the nonlinear terms resulting from the implicit semi-Lagrangian time discretization. The new formulation is referred to as the “NOLOG formulation” as it eliminates the logarithmic tendencies from the undiscretized meteorological equations. Preliminary test results suggest that the “NOLOG formulation” leads to improved model stability by reducing model sensitivity to the basic state temperature. The new formulation will be introduced in the seminar and the relevant test results will be presented.

The presentation will also highlight the implications of the two main numerical dissipation mechanisms implemented in GEM to remove high wave number noise, namely, off-centered averaging in the semi-Lagrangian scheme and horizontal diffusion. The objective is to determine the optimal combination of off-centering and horizontal diffusion that can result in improved accuracy through more scale-selective noise removal without compromising model stability.