

Seminaire vendredi le 8 mai 10h30 / Seminar Friday 8 May 10h30

Presentateurs: Michael Moran & Donald Talbot

Sujet/Subject: The New Air Quality Forecast Model GEM-MACH15:
Description and Evaluation

Presentation: Français & Anglais / English & French

Lieu/Room: 1St Floor Conference room (Salle des Vents)

NOTEZ SVP le début anticipé de cette présentation
PLEASE NOTE the early start of this presentation

Résumé / Abstract:

The New Air Quality Forecast Model GEM-MACH15: Description and Evaluation
Michael Moran, Sylvain Ménard, Donald Talbot, Paul Makar, Wanmin Gong, and
Véronique Bouchet

Development of a new Air Quality Forecast Model called GEM-MACH has been underway in Downsview and Dorval since 2006. The goal of this project is to replace EC's current operational off-line AQFM, CHRONOS, by a limited-area configuration of GEM-MACH, an *in-line* chemical transport model that is embedded within GEM. Both models predict atmospheric concentrations of four important air pollutants: ozone (O₃); nitrogen dioxide (NO₂); and particulate matter with aerodynamic diameter less than 2.5 µm (PM_{2.5}) and less than 10 µm (PM₁₀).

To build GEM-MACH, a number of AQ process representations from EC's AURAMS chemical transport model have been implemented within GEM using the chemistry interface introduced in GEM release v3.3.0. AURAMS is based on CHRONOS, but it includes a number of additional AQ process representations. In order to allow the option of considering fewer PM-related tracers in GEM-MACH and hence reduce execution time, some AURAMS PM-related process representations were modified to accommodate a two-bin sectional representation of the PM size distribution (i.e., 0 to 2.5 µm and 2.5 to 10 µm) instead of the 12 size bins typically employed by AURAMS. CHRONOS uses a similar two-bin sectional representation, but GEM-MACH considers more PM chemical components and more PM processes than CHRONOS.

GEM-MACH15 is a limited-area configuration of GEM MACH for a uniform North American grid that is piloted by GEM15. A version of GEM-MACH15 without PM processes was run by CMC as an experimental product in summer 2008. This presentation will describe the design and formulation of the full version of GEM-MACH and the particular configuration chosen for GEM-MACH15, including the piloting strategy used last summer and a new strategy developed to pilot GEM-MACH15 with the new "strato" version of GEM15. Objective scores for O₃ and NO₂ for summer 2008 for CHRONOS and the experimental version of GEM-MACH15 will then be presented, followed by objective scores and analysis for the full version of GEM-MACH15 for meteorology and for O₃, NO₂, and PM_{2.5} for winter 2008 and summer 2008. This presentation will also serve as a supplement to a proposal to be presented at the next CPOP meeting.