

Adjoint of the non-hydrostatic GEMDM LAM

Monique Tanguay

Meteorological Service of Canada, Dorval, Québec, Canada

Email: monique.tanguay@ec.gc.ca

GEMDM refers to the distributed memory version of the Global Environmental Multiscale (GEM) model (Côté *et al.*, 1998) used operationally at the Canadian Meteorological Centre. The non-hydrostatic version is also available (Yeh *et al.*, 2002). Recently, GEMDM was also configured for limited area modelling (LAM) (Desgagné and Lee, 2003). On the assimilation side, work are currently in progress to extend the 3D-Var system (Gauthier *et al.*, 1999) to a 4D-Var system (Gauthier *et al.*, 2002). This has requested the coding of the adjoint of the first version of GEMDM. Recently, this coding has been extended to the new capabilities of GEMDM i.e. its non-hydrostatic and LAM aspects. Detailed experiments are planned for the coming year.

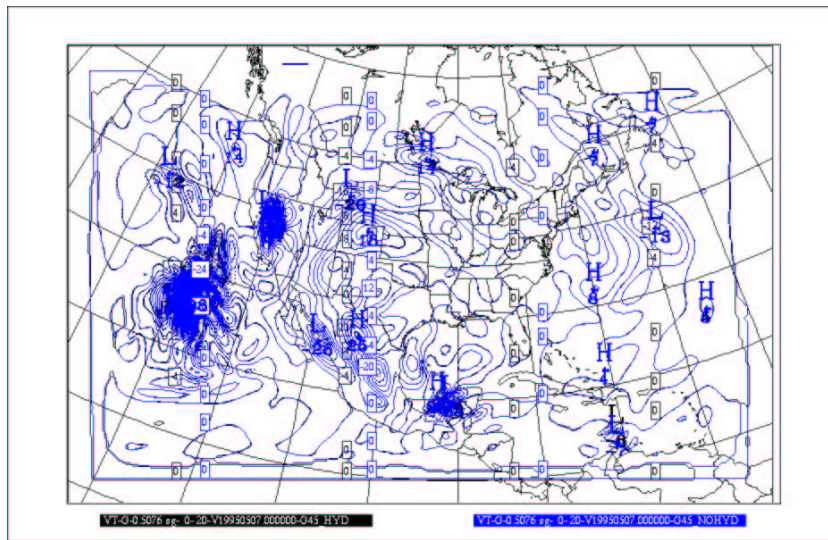


Fig: Superimposed hydro. and non-hydro. adjoint VT, 500 hPa, $dx = .45^\circ$, after $t = 4$ hr.

References

- Côté J., S. Gravel, A. Méthot, A. Patoine, M. Roch, and A. Staniforth, 1998: The operational CMC-MRB Global Environmental Multiscale (GEM) model: Part I - Design considerations and formulation, *Mon. Wea. Rev.* 126, 1373-1395.
- Gauthier P., M. Tanguay, S. Pellerin, N. Ek, S. Laroche, and J. Morneau, 2002: Current status of the pre-operational 4D-Var assimilation system at MSC, 5th Workshop on Adjoint Applications in Dynamic Meteorology, Mount Bethel, Pennsylvania, April 2002.
- Gauthier P., C. Charette, L. Fillion, P. Koclas, and S. Laroche, 1999: Implementation of a 3D Variational data assimilation system at the Canadian Meteorological Centre. Part I: The global analysis, *Atmosphere-Ocean*, Vol. XXXVII, No.2, pp . 103-156.
- Yeh, K.-S., J. Côté, S. Gravel, A. Méthot, A. Patoine, M. Roch, and A. Staniforth, 2002: The CMC-MRB global environmental multiscale (GEM) model. Part III: Nonhydrostatic formulation, *Mon. Wea. Rev.*, 130, 2, 339-356.