

1116-65-481

Andrei Bourchtein* (bourchtein@gmail.com), Rua Gomes Carneiro 1, Campus Porto da UFPEL, Pelotas, 96010-610, Brazil, and **Ludmila Bourchtein**. *A time-splitting scheme for non-hydrostatic atmospheric models.*

The non-hydrostatic atmospheric models contain solutions originated by various physical sources such as the atmosphere compressibility, deformation effects, the gravity force, and also by the non-inertial forces related to the rotated reference frame. These phenomena have different characteristics of the propagation speed and energy contribution. The acoustic waves are the fastest and have negligible energy contribution, the inertial processes are the slowest and the most valuable in energy spectrum, and the gravity waves occupy the intermediate position.

In this study, we develop a semi-implicit time-splitting scheme for the non-hydrostatic atmospheric model. The acoustic and gravity waves are approximated implicitly, while slow inertial terms are treated explicitly. At each time step, the implicit part of approximation is reduced to three-dimensional elliptic equations solved by multigrid method. Stability analysis of the scheme shows that the time step is restricted only by the maximum velocity of advection. The performed numerical experiments show computational efficiency of the designed scheme and accuracy of the predicted atmospheric fields. (Received September 03, 2015)