1077-65-1814 **Andrei Bourchtein*** (bourchtein@gmail.com), Rua Anchieta 4715, bloco K, ap.402, Pelotas, 96015-420, Brazil, and **Ludmila Bourchtein**. *Time-splitting scheme for nonhydrostatic atmospheric model.*

Complete three-dimensional models of the atmosphere (Navier-Stokes or Euler equations) contain solutions with different space and time scales. It is well-known that the fastest atmospheric waves are the acoustic ones, which do not contain any significant part of the atmospheric energy. The slower gravity waves are more energy valuable, while relatively slow advective processes and Rossby waves carry the main part of the atmospheric energy. In this study, a time-splitting finite difference scheme is proposed for the nonhydrostatic atmospheric model, which approximates implicitly the fast acoustic and gravity waves, while slow processes are treated explicitly. Such time approximation requires solution of three-dimensional elliptic equations at each time step. Efficient elliptic solver is based on decoupling in the vertical direction and splitting in the horizontal directions. Stability analysis of the scheme shows that the time step is restricted only by the maximum velocity of advection and does not depend on speed propagation of the fast waves. The performed numerical experiments show computational efficiency of the designed scheme and accuracy of the predicted atmospheric fields. (Received September 21, 2011)