1086-86-2057 **Andrei Bourchtein*** (bourchtein@gmail.com), Rua Anchieta 4715, bloco K, ap.402, Pelotas, RS 96015-420, Brazil, and **Ludmila Bourchtein**. *Scale-adaptive numerical scheme for atmospheric modeling.*

The atmosphere is a complex system supporting processes of different space and time scales. The corresponding three-dimensional mathematical models of the atmosphere contain multi-scale solutions with fast and slow components. It is well-known that the fastest atmospheric waves do not contain any significant part of the atmospheric energy, while relatively slow synoptic processes carry the main part of the available energy. Since differential approximations, which filter out fast waves, introduce distortions to the main physical modes, the problem of stiffness of the complete mathematical models of atmospheric dynamics should be addressed in a design of numerical scheme. In this study, a semi-implicit finite difference scheme is proposed for the atmospheric model based on the Euler equations. The fast acoustic and gravity waves are approximated implicitly and with lower accuracy, while slow advective terms and Rossby modes are treated explicitly and with higher order of approximation. The linear stability of the proposed scheme is analyzed and it is shown that the time step can be chosen in accordance with the physical requirements. The numerical experiments with actual atmospheric data are performed and the results of forecasts are compared with those of conventional schemes. (Received September 24, 2012)