

OROGRAPHIC EFFECTS ON NUMERICAL STABILITY IN ATMOSPHERIC FRONT SIMULATION

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A 2D nonhydrostatic meteorological model with a leap-frog type scheme for time discretization and special operators of space discretization to provide conservation of momentum and scalars is considered. These schemes, being unconditionally stable for plane orography, are shown to be conditionally stable for steep orography. The mountain steepness limitations necessary for numerical stability are obtained by solving numerically an amplification matrix eigenvalue problem [1]. A finite-element version of the model which is free of these limitations [2] is used to simulate the effects of atmospheric front propagation over a valley. The results of 2D model simulations are presented.

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