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Testing the Anelastic Nonhydrostatic Model EULAG as a Prospective Dynamical Core of a Numerical Weather Prediction Model Part II: Simulations of Supercell

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Abstract

The anelastic nonhydrostatic model EULAG is a candidate for the future dynamical core of a numerical weather prediction model. Achieving such an objective requires a number of experiments focused on testing correctness of the solutions and robustness of the solver. In the spirit of this idea, a set of tests related to standard atmospheric problems was performed, of which the two regarding development and evolution of a supercell were employed as benchmarks of moist dynamics of the model. Their results are discussed in this paper. Development and evolution of a storm system with a set of characteristic features such as storm splitting along with the generation of horizontal vorticity and cold pool formation is investigated. In addition, the influence of domain geometry, boundary conditions and subgrid-scale mixing is examined.

Key words: moist convection, supercell simulation, storm splitting, dynamical core, anelastic equations.