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Application Semi-Lagrangian advection for estimation energy transition in the atmosphere

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Partial derivative of some meteorological quantity by time may be used for research of budget of atmospheric energy, its transformation and spatial structure. One of possible way of calculation of fields of partial derivative is based on use advection that obtains through Semi-Lagrange approach. Principle of calculation algorithms is shown in this investigation. The weather case, which observed the 9-th of April 2012, was simulated with the help of WRF ARW model. South-West Ukraine and Romania suffered in connection with heavy snowfall and strong wind. At the same time thunderstorms were observed over North Ukraine. Results of usage of partial derivative for the research of energy transitions in the atmosphere are presented. The WRF model data were initial and boundary conditions for the proposed algorithm. Horizontal distributions of surface convective available potential energy were modeled with the help of COSMO-Model.