Sensitivity of modeled atmospheric convection to effective viscosity

Zbigniew P. Piotrowski[2], Piotr K. Smolarkiewicz[1] and Szymon P. Malinowski[2]

[1]University of Warsaw
Institute of Geophysics
ul.Pasteura 7,
02-093 Warszawa
Poland
l

[2] NCAR, MMM
PO Box 3000
Boulder, CO 80307
U.S.A

We present idealized dry simulations of the convective boundary layer with the horizontal resolutions of 500 m, 1 km and more. We show that organization of convection within the ABL in such simulations is sensitive to the effective (resolved+subgrid+numerical) heat and momentum transport coefficients. In particular, using the flux corrected of MPDATA advection scheme allowing for the control of transport processes in the simulations, we demonstrate the sensitivity of solutions to the anisotropy of transport coefficients.