



Estimation of convection characteristics in high resolution simulations

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Some characteristic properties of mass and energy fluxes in different parts of the atmospheric cyclone and associated front are examined in high resolution numerical simulations. Although much of the kinetic energy of the atmospheric flow is distributed accordingly to the cascade mode, certain evidence of up-scale transfer on meso-scales was found. Processes in this part of the energy spectrum can be described as a direct consequence of the convection and associated latent heat and water mass fluxes as well as available potential energy. The typical scale of these processes ranges from a few kilometers to about 30 km. The energy budget and fluxes are estimated for both sides of the front. The design of the experiments provides an opportunity to evaluate some specific features like additional cooling from the evaporation of cloud and rain water as well as the fractional area occupied by downdraught and updraught convection. The simulations also show the sensitivity of the results to the planetary boundary layer and convection parameterization schemes.