



Regional summer precipitation characteristics in Europe

S. Bachner (1), **S. Ivanov** (2), A. Kapala (1), C. Simmer (1), V. Dmitrenko (2) and G. Ivus (2)

(1) Meteorological Institute, University of Bonn, Germany, (2) Odessa State Environmental University, Ukraine (svvivo@te.net.ua / +38 048 746-7339)

The use of Regional Climate Models for scenario simulations of the future climate has become possible in the last years. For the careful interpretation of scenario simulation results, the models should be evaluated with respect to their ability to reproduce statistical characteristics of precipitation. Two models are used in this study: the CLM, developed by the German Weather Service and several institutes in Germany, and the WRF from National Center for Atmospheric Research. A comparison of both models on the basis of precipitation characteristics over Europe is performed. This could help understanding further aspects of model uncertainties in the simulation of precipitation. Especially since the question of increasing extremes in a changing climate becomes more important, characteristics other than mean values have to be evaluated in more detail. In this study, we focus on summer precipitation in Germany and Ukraine. Different summers seasons have been modeled, forced by ERA40 reanalysis, and have been analyzed regarding different statistical precipitation characteristics like e.g. the frequency distribution and characteristics of heavy precipitation. A comparison is made to station data of the German Weather Service at a daily and seasonal time scale. The models are able to represent the frequency distribution quite well but significantly underestimate wet-day frequency. For most of the statistical characteristics there is high regional and interannual variability of the model performance. Problems remain also in the spatial structure of precipitation. Sensitivity studies with different physical parameterisations reveal high model uncertainty related to model physics.

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