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Global evaluation of the RSM simulated energy and water budgets through transferability studies during CEOP

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The aim of this study is to conduct a global evaluation of the Scripps Experimental Climate Prediction Center (ECPC) Regional Spectral Model (RSM) simulated energy and water budgets. This is achieved by transferring the RSM to various domains impacted by different meteorological conditions. As (1.) each regional model has been developed for a specific region and (2.) the regional simulation of the water- and energy cycle is very sensitive to how physical processes are represented within a regional model, transferability studies are a suitable approach to evaluate the performance of a regional model under different meteorological conditions. In particular, the RSM has been transferred to seven different regional domains covering the eight Continental Scale Experiments (CSE) of GEWEX. The data used for the evaluation is provided by the Coordinated Enhanced Observation Period (CEOP) in situ and remote sensing observations from 1 July 2001 until 31 December 2004. As equilibration of the land surface is necessary the model runs begin July 1, 1999. The RSM is run at 50 km horizontal resolution using NCEP reanalysis as initialization and boundary conditions.

Comparisons of the RSM simulated precipitation with CEOP reference site measurements during CEOP I and with GPCC data during the year 2001 show that RSM is capable of simulating realistic precipitation patterns over all seven CSE domains, although in comparison to the CEOP 1 reference site measurements as well as the GPCC data the RSM shows higher rates of precipitation. Largest differences between RSM simulated and measured precipitation are connected with the ITCZ. As differences between model and measurements may have various reasons, further studies will be carried out regarding the uncertainties connected with the measurements as

well as with NCEP reanalysis used for initialization. The completion and analysis of the CEOP simulations for the 7 domains will give reliable insight into the annual cycle of the RSM simulated precipitation and other energy and water cycle components. This will lead to global improvements in simulating the water and energy cycles.