



Global evaluation of the RSM simulated precipitation through transferability studies during CEOP

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The RSM simulated precipitation is globally evaluated by transferring the regional model RSM to seven different regions of the globe. These model domains are selected following the eight Continental Scale Experiments of GEWEX so that a broad variety of physical and dynamical meteorological processes are covered. For the RSM evaluation GPCP data, CEOP reference site measurements and HOAPS / GPCC data are used. The evaluation is carried out for the first half of EOP III (October 2002 to March 2003). After estimating the uncertainty ranges of both, the model and the observations, a model deficiency in the precipitation simulation has been localized for all model domains, except for the domain over MAGS. Mostly the precipitation is over-predicted, except for the domain over BALTEX, where it is under-predicted. Most of the over-prediction is connected with the ITCZ convection or the monsoon convection (SE Asia). Also, stratiform / dynamic precipitation is over-predicted caused by forced lifting of air masses at high orography. Sensitivity tests with four different convection schemes are carried out. These are 1) the Relaxed Arakawa Schubert scheme (RAS), 2) the Simplified Arakawa Schubert scheme (SAS), 3) the Kain Fritsch scheme (KF) and 4) the NCAR CCM scheme (CCM). The results show that the RSM precipitation simulation can be significantly improved for all domains using either the KF scheme or the SAS scheme. Best results for the ITCZ convective precipitation can be achieved using the SAS convection scheme. For the monsoon convective precipitation the KF and the SAS convection scheme show best results. Further investigation regarding the stratiform / dynamic precipitation and the annual cycle is needed, especially for the domains over LBA, AMMA and GAPP.