



The transferability of the ICTP Regional Climate Model

J. S. Pal (1), F. Giorgi (1), X. Bi (1), X. Gao (1)

(1) Abdus Salam International Centre for Theoretical Physics, 34100 Trieste, Italy, (2)
National Climate Center, Beijing, China 100081 [jpal@ictp.trieste.it/+39 040 2240449]

In this study, we analyze the transferability of the ICTP Regional Climate Model version 3 (RegCM3). A series of simulations are performed over six diverse climatic regions: Africa, East Asia, Europe, North America, South America, and South Asia. The model is integrated for a 14 year period at a 50-km resolution and forced by reanalysis data. In addition, the transferability of two cumulus convection schemes is compared: the default Grell scheme and the recently implemented Emanuel scheme. We find that the simulations implementing the Grell convection scheme perform well over mid-latitudes compared to surface and atmospheric observations indicating skillful transferability. However, when implemented over the Tropics, a substantial low-level cold/dry bias and mid-level warm/moist bias is noted. This suggests that the RegCM3 coupled with the Grell scheme is not well-transferable between mid-latitude and tropical domains. When using the Emanuel scheme to represent convection, we note a substantial improvement in performance over the tropical domains, while maintaining a similar performance over the mid-latitude domains compared to the simulations using the Grell scheme. Although preliminary, the results from numerical experiments suggest that the RegCM3 implementing the Emanuel convection scheme exhibits a greater degree of transferability compared to those implementing the Grell convection scheme.