Geophysical Research Abstracts,
Vol. 11, EGU2009-11954, 2009
EGU General Assembly 2009

Variable-Resolution AGCM Simulation of East China Summer Monsoon Precipitation Variability during 1958-2000

L. Zou (1), T. Zhou (1), and L. Li (2)

(1) LASG/IAP, Chinese Academy of Sciences, Beijing, China (zoulw@mail.iap.ac.cn), (2) CNRS, LMD, Paris, France (li@lmd.jussieu.fr)

A variable-resolution Atmospheric General Circulation Model (AGCM)-LMDZ4, which has a zoom centered in China to reach a local resolution of about 60 km, is used to simulate the interannual variations of East China summer monsoon precipitation during 1958-2000. Results show that LMDZ4 can reasonably reproduce the basic features of the summer monsoon precipitation over East China. However, the model tends to overestimate the summer rainfall in East China, especially along the lower reaches of the Yellow River valley. LMDZ4 can also well capture the dominant modes of the summer monsoon precipitation over East China during 1958-2000 in terms of Empirical Orthogonal Function (EOF) analysis. But the main rain belts associated with the first two leading modes shift northward. Major periods of the leading principle components (PCs) are well captured. The physical mechanisms governing the first two leading modes of interannual variability are investigated by a simple regression methodology between the PCs and the vertically integrated moisture flux anomalies, 500hPa geopotential height anomalies and 200hPa zonal wind anomalies, respectively. Model results resemble the observation in general patterns. The northward shift of main rainbelts in LMDZ4 is a result of water vapor transport bias, which is attributed to stronger low-level southerlies. The cause of the low-level bias seems to be related to the overestimated sensible heating over the southern part of China in previous season, which favors a cyclonic bias on its upstream, and induces a stronger south wind.