Geophysical Research Abstracts, Vol. 8, 06458, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06458

1 Studying land-atmosphere feedbacks using the ECHAM5/JSBACH model

2 Manik Bali

Max Planck Institute for Meteorologie 53 Bundesstrase Hamburg Germany

Land atmosphere feedbacks play a crucial role in determining climate from seasonal to decadal to even longer time scales. This feedback affects the seasonal variability of monsoon and forms the basis of our attempt to provide a realistic seasonal simulation of mesoscale systems like the monsoon. On a longer time scale the land-atmosphere feedbacks are directly influenced by anthropogenic effects and constitute an important factor for climate change due to human factors.

As a first step we first try to understand and analyze the relationship between vegetation and monsoon as observed in nature by comparing satellite based measurements of Fraction of Photo Synthetically Active Radiation (FaPAR) (a measure of vegetation density) with the observed monsoon precipitation on a seasonal scale. To understand the processes we compare the observations with the simulation of monsoon processes by the ECHAM5/JSBACH which is a dynamic land vegetation model coupled with the standard ECHAM5 atmospheric model. These simulations suggest a strong coupling of seasonal monsoon precipitation and the vegetation. Simulations also suggest that a realistic soil moisture field in the ECHAM5/JSBACH could provide more realistic monsoon simulations.

We propose to develop a nudging scheme to ingest the satellite derived FaPAR (as it is closely linked to seasonal precipitation as shown in observations and simulations) into the ECHAM5/JSBACH model to produce a realistic soil moisture field and subsequently carry out seasonal simulations of monsoon. As a first step to this end we

have run the ECHAM5/JSBACH model using prescribed soil moisture fields derived from meteorological forcings (precipitation, Tmin and Tmax) and studied the impact of realistically varying soil moisture on the monsoon simulation at a seasonal scale.