Geophysical Research Abstracts
Vol. 14, EGU2012-187, 2012
EGU General Assembly 2012

Indian Summer Monsoon Variability and its Physical Mechanisms in the last Millennium

S. Polanski (1), F. Hanf (1), D. Befort (1), F. Menzel (1), U. Cubasch (1), and G.C. Leckebusch (2)

(1) Freie Universität Berlin, Institute for Meteorology, Germany, stefan.polanski@met.fu-berlin.de, Franziska.Hanf@fu-berlin.de, daniel,befort@met.fu-berlin.de, franziska.menzel@met.fu-berlin.de, cubasch@zedat.fu-berlin.de, (2) University of Birmingham, School of Geography, Earth and Environmental Sciences, United Kingdom, G.C.Leckebusch@bham.ac.uk

The last Millennium is the best documented climate period affected by variations in external forcing and an internal variability in the highly nonlinear climate system. According to that the Indian Summer Monsoon and its high variability on different time scales plays an important role, studied in the interdisciplinary HIMPAC project (Himalaya – Modern and Past Climates). In order to understand the forcing mechanisms, feedbacks and amplifiers concerning monsoon variability of the last 1000 years, the five ensemble members of the full forced simulation of the Millennium experiment (Jungclaus, J. et al., 2010), using the coupled COSMOS Earth System Model (ECHAM5/JSBACH-MPIOM/HAMOCC) in a T31L19 spatial resolution, have been statistically analyzed to detect strong wet and dry periods of monsoonal rainfall due to interannual rainfall anomalies and special monsoon indices within the South Asian Monsoon region. Later the selected periods of extreme rainfall events have been simulated in a higher spatial resolution with the uncoupled atmosphere version of COSMOS Earth System Model (ECHAM5) in a T63L31 resolution. The focus is on the monsoon variability of 200-years-long time slices within the Medieval Climate Optimum (900-1100 AD), the Little Ice Age (1500-1700 AD) and the Preindustrial (1800-2000). A comparison with paleoclimatic reconstructions from Dandak and Jhumar cave record (Sinha, A. et al., 2011) helps to verify the model results, and the model has been used to check the consistency of the proxy data. I addition high resolution regional climate model simulations with COSMO-CLM will be carried out for the selected time slices driven by the ECHAM5 simulation results.