Geophysical Research Abstracts
Vol. 16, EGU2014-10450, 2014
EGU General Assembly 2014

Influence of anthropogenic forcing and the inherent feedback processes on the Indian summer monsoon

Bodo Ahrens and Shakeel Asharaf

Goethe-University, Institue of Atmospheric and Environmental Sciences, Frankfurt aM Main, Germany
(asharaf@iau.uni-frankfurt.de)

Summer monsoon rainfall was examined in two different scenarios B1 and RCP4.5 of the Coupled Model Inter comparison Projects CMIP3 and CMIP5, respectively. For this investigation, the regional climate model (RCM) COSMO-CLM and its driving global coupled atmospheric ocean model (GCM) MPI-ESM-LR were used. The transient projection simulations with the RCM gave mixed results for the Indian summer monsoon season. For instance, CCLM with scenario B1 simulation shows a decreasing trend for all Indian monsoon rainfall in contrast to the driving model. On the other hand increasing trend was found in CCLM with RCP4.5 experiment, which is consistent with its driving model. Both simulations experience a reduction in efficiency of monsoonal rainfall, while the remotely induced precipitation increases in future climate period. A close comparison of the projected (RCP4.5 and B1) rainfall with the pre-industrial greenhouse gas control (CTL) simulated rainfall exposes the robustness of the increased remotely formed precipitation signal, which is more and statistically significant in RCP4.5 than B1. However, variability of the precipitation efficiency (in both GCMs and RCMs) confines within the range of CTL's variability, inferring the interpretations of precipitation are not straightforward. Note that the CTL simulations provide an estimate of the internal variability of the climate (modeled) system. Our study suggests that the projected rainfall trends are yet ambiguous and uncertain since the resulted monsoonal rainfall greatly depends on the complementing behavior of remote and efficiency generated precipitation.