



## **Hydrological Cycle over South and Southeast Asian River Basins as Simulated by PCMDI/CMIP3 Experiments**

Shabeh ul Hasson (1), Valerio Lucarini (1,2), and Salvatore Pascale (1)

(1) Meteorological Institute, KlimaCampus, University of Hamburg, Hamburg, Germany (shabeh.hasson@zmaw.de), (2) Department of Mathematics and Statistics, University of Reading, Reading, UK

We investigate how CMIP3 climate models describe the hydrological cycle over four major South and Southeast Asian river basins (Indus, Ganges, Brahmaputra and Mekong) for the XX, XXI, and XXII centuries. For the XX century, models' simulated water balance and total runoff quantities are neither consistent with the observed mean river discharges nor among the models. Most of the models underestimate the water balance for the Ganges, Brahmaputra and Mekong basin and overestimate it for the Indus basin. The only modest inter-model agreement is found for the Indus basin in terms of precipitation, evaporation and the strength of the hydrological cycle and for the Brahmaputra basin in terms of evaporation. While some models show inconsistencies for the Indus and the Ganges basins, most of the models seem to conserve water at the river basin scale up to a good degree of approximation. Models agree on a negative change of the water balance for Indus and a positive change in the strength of the hydrological cycle, whereas for Brahmaputra, Mekong and Ganges, most of the models project a positive change in both quantities. Most of the models foresee an increase in the inter-annual variability of the water balance for the Ganges and Mekong basins which is consistent with the projected changes in the Monsoon precipitation. No considerable future change in the inter-annual variability of water balance is found for the Indus basin, characterized by a more complex meteorology, because its precipitation regime is determined not only by the summer monsoon but also by the winter mid-latitude disturbances.