

## ***Interactive comment on “Seasonality of the hydrological cycle in major South and Southeast Asian River Basins as simulated by PCMDI/CMIP3 experiments” by S. Hasson et al.***

**Anonymous Referee #1**

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### General comments

The manuscript is a companion paper of a previously published paper (Hasson et al, 2013) where the performances of CMIP3 climate models in reproducing the hydrological cycle over four major South and Southeast Asian river basins (Indus, Ganges, Brahmaputra and Mekong) were analyzed on a yearly basis. In this paper the authors investigate more deeply some deficiencies emerged in the first study. Specifically they focus on the ability of the analyzed models in reproducing the seasonal cycles, which, in the considered areas, are mainly driven by the monsoon. A major finding of the work is that most of the models are not able to correctly reproduce (or to capture at all) the monsoon signal, in terms of onset, duration, and total precipitation. These deficiencies

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are also reflected when looking at other variables of interest for the hydrological cycle, such as evaporation and runoff. The paper also shows that the major deficiencies occur in the Indus basin, which is located on the boundary between two different large-scale circulation modes, namely the extra-tropical weather system and monsoon, whose interaction results in the typical bimodal precipitation distribution.

Overall my judgment for the paper is very positive, I only suggest some technical corrections:

- 1) Page 636, in Eq. (1) the integral should be divided by the area A.
- 2) Page 636, in line 3 only three variable (P, E and R) are mentioned, while on line 7 and 9 authors refer to four variables.
- 3) Page 636, in the right-hand side of Eq. (2) all term should be defined.
- 4) Page 637, lines 3-4 are not clear.
- 5) Table 1: some of the acronyms differ from those used in the Figures. I suggest to homogenize or to add a column for the acronyms used in the paper. Moreover I suggest to order the models in Table 1 with the same order as in Figures.

Finally, a careful proofreading of the paper is needed to eliminate some typos (e.g. “tessellation” on line 18, page 635; “precipitation” in line 23, page 650; extra comma in line 16, page 656; etc. the above list is not exhaustive).

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