

Interactive comment on “Sensitivity study of the Regional Climate Model RegCM4 to different convective schemes over West Africa” by Brahima Koné et al.

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Received and published: 4 September 2018

1. Comments from Referee2: Generally, any result that is used to support a statement about model performance (either positive or negative) should include a test of statistical significance (Fig. 3 and Fig. 6). Differences shown are significant?

Author’s response: Thank you for your comment. You are right. We added a test of statically significance at 0.05 levels in this revised version. The test shows that the differences are statistically significant at 95%.

Author’s changes in manuscript: Please see at P8, L247-L249; P9, L301-L303; P31

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and P34 for figures.

2. Comments from Referee2: Looking at precipitation extremes would be my first suggestion but the authors could look at other variables/statistics.

Author's response: Thank you for your comment. That is right; We plan in a next study to investigate the sensitivity of temperature and precipitation extremes simulated by RegCM4-CLM4.5 to different convective schemes. In this paper, we are interested in the sensitivity of the mean climate.

Author's changes in manuscript: Please see at P17, L546-L550

3. Comments from Referee2: There is no justification for selecting 2003 and 2004 the analysis? Their motivations are not clear, Is there any particularities (dry, wet or normal) for those years?

Author's response: Thank you for your comment. The years 2003 and 2004 has been selected in this study because they corresponded respectively to dry and wet year in this region.

Author's changes in manuscript: Please see at P6 L179-L180

4. Comments from Referee2: Recent studies based were with RegCM simulation on a grid of 25km, in this manuscript there is no explanation on why they are running the simulation with a resolution of 50km (0.44°x0.44°).

Author's response: Thank you. The ICBC data in our possession were EIN15 (1.5° of resolution) and were appropriate for simulations at this standard resolution of 50Km to investigate the mean climate at regional scale. For the next study on the climate extremes, we will use EIN75 (0.75° of resolution) to perform simulations at 25 Km resolution.

5. Comments from Referee2: My other concern is about the observation data used in this study, why they using the 2.5x2.5 GPCP, instead of 1x1 GPCP dataset? Why only

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GPCP, when other products like CHIRPS (0.01x0.01), ARC2 (0.1x0.1) are available and freely accessible.

Author's response: Thank you for your comment. That is right. In this revised version, we use GPCP 1°x1° dataset and TRMM dataset.

Author's changes in manuscript: Please see the Table 2 and the Fig. 9a

6. Comments from Referee2: For me, to give originality to this paper, authors should analyze diurnal cycle of rainfall.

Author's response: Thank you for your comment. We plan to investigate the diurnal in a second paper on the sensitivity of precipitation and temperature extremes with the same model at 0.25 Km resolution.

7. Comments from Referee2: Authors should convince the readers on the novelty of this research.

Author's response: Thank you for your comment. The originality of this study is in the fact that it is the first time RegCM4 with CLM as land surface scheme is assessed using a full set of convective schemes over Africa.

Author's changes in manuscript: Please see at P3 L91 -L103

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2018-44>, 2018.

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