

Review of revised manuscript “Superparameterized cloud effects in the GCM EMAC (v2.50) – influences of model configuration” by Rybka and Tost (with a modified title, previously “Effects of model configuration for superparameterized long-term simulations – Implementation of a cloud resolving model in EMAC (v2.50)”.

Recommendation: accept after minor revisions

This is a revised manuscript that I reviewed before. I still have some comments on the manuscript, see below. Also, some of my previous comments were left unanswered. For instance, the details of the coupling or a suggestion to modify the figures so GCM results are better distinguished from SP-GCM.

Specific (mostly minor) comments.

1. Long sentences are difficult to follow in several (many?) places. This is mostly because of missing commas in long sentences. I understand that the authors are not native speakers, but a professional help would be needed if the journal does not provide technical editing. Similarly, there are some awkward sentences/statements that need to be corrected (e.g., P9L7: “too less”, maybe “not enough?”).
2. Following on my comment 5 from the previous review: which fields are coupled between GCM and CRM? I think temperature and moisture for sure. What about momenta? Vertical momentum cannot be coupled as it has to be zero in the horizontally-periodic CRM. How are the horizontal momenta coupled? Also, I assume that the large-scale moist physics (cloud and precipitation formation, precipitation fallout, etc.) is inactive in SP simulations. Are mean cloud and precipitation fields advected by the host GCM? Please expand the discussion of the SP GCM formulation.
3. The most outstanding feature of simulations vs observations in Table 2 is the factor 3 to 4 overestimation of the LWP and a significant overestimation of IWP. These are briefly discussed in the text, but I feel they should be strongly emphasized in the discussion, including possible reasons.
4. I feel the authors should strongly emphasize that the traditional GCM simulation, CTRL, is the outcome of a significant tuning and years of experience of the model developers. This is in contrast to virtually no tuning in SP-GCM.
5. It is not clear from Table 2 and equation on p. 7 that the NetCRE is at the top of the atmosphere.
6. I feel a better introduction to the Taylor diagram would help the reader.
7. This is comment 15 from the previous review: Figure 2 (and maybe other figures). I suggested not to use a color for CTRL, but a symbol (e.g., a star). The authors claim this is not possible. I do not agree, but leave it to the authors to decide. Another possibility would be to use the same symbol (circle, square, etc.), and the white color inside. The key point is that CTRL should be more distinct from other simulation results.
8. P. 10. Some of the statements (e.g., L16-18, 48-52) seem not supported by the figures. Please clarify.
9. Figure 5. First, the line colors correspond to the colors above the inserted panels, correct? If so, please state that in the caption. The Warm Pool inserts show the relatively clearly the geography, but this is unclear in the inserted panels on the right. Does the narrow vertical white strip represent South America? Would it help if the lat-lon scale is preserved between the inserted panels? That is, inserted panels on the

right should be narrow strips with different aspect ratio than the left panels. (“Sight” in the caption should be “side”).

10. P. 15. The list in the right column is unclear. First, SP-EMAC is not needed. OR1 lists east-west orientation, but OR2 and OR3 exclude that information.

11. Figure 10. First, the captions above lower 9 panels are barely visible. Please make them much larger and bold, perhaps within the panels. The most outstanding feature of this figure is that panels across the diagonals are similar. That is, the upper left panel looks similar to the lower right panel, and the lower left is similar to the upper right. This should be noticed upfront and possible reasons can be included in the discussion.

12. Section 4. I feel some of the specific results summarized here agree with previous studies. It would be good to include more references in this section.