

Interactive comment on “Incorporation of inline warm-rain diagnostics into the COSP2 satellite simulator for process-oriented model evaluation” by Takuro Michibata et al.

Johannes Mülmenstädt (Referee)

johannes.muelmenstaedt@uni-leipzig.de

Received and published: 31 July 2019

I have reviewed “Incorporation of inline warm-rain diagnostics into the COSP2 satellite simulator for process-oriented model evaluation” by Michibata et al. The manuscript documents extensions to the COSP v2 satellite simulator package that, in my opinion, will greatly advance the understanding of warm rain processes in GCMs and contribute to improvements in process realism.

Below is a list of fairly minor comments that should be addressed before publication.

- I am not complaining about the -15 and 0 dBZe thresholds (they seem to be C1

used frequently), but I would appreciate a sentence of discussion or a reference on why these particular values were chosen.

- Similarly, I am not complaining about the use of simple, column-maximum Z_e , but perhaps the authors could comment on the advantages and disadvantages of this approach compared to the CloudSat precipitation flag simulator presented in Kay et al. (2018).
- I believe the recommendation of 100 subcolumns per one degree (lat/lon) of model resolution deserves explanation or a reference.
- In the same vein, it appears that the authors intend for the number of subcolumns to scale with the grid spacing, not the grid-box area (140 subcolumns at 1.4 degree resolution, p. 4, l. 31). It would be good to explain why.
- In the discussion of the model results, the authors should explain whether their CFODDs include convective precipitation or only stratiform, and whether MIROC uses the same microphysics in convective and stratiform clouds.
- Please confirm that one of the repositories listed in the code availability section will contain the source code for the online statistics (I assume so, but the wording is a bit ambiguous).

I am also attaching an annotated PDF with very minor comments that the authors may find helpful in proofreading the manuscript.

Please also note the supplement to this comment:

<https://www.geosci-model-dev-discuss.net/gmd-2019-104/gmd-2019-104-RC3-supplement.pdf>

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2019-104>, 2019.