

Interactive comment on “A statistical and process oriented evaluation of cloud radiative effects in high resolution global models” by Manu Anna Thomas et al.

Anonymous Referee #2

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Overview:

The goal of this model evaluation study is to compare the cloud radiative effects between standard-resolution and high-resolution climate models. The authors find that cloud radiative effects differ strongly between models, but not nearly as much between runs with different resolutions of the same model. The authors conclude that the apparent insensitivity to increased atmospheric horizontal resolution indicates that physical parameterizations play a dominant role in determining the behavior of cloud-radiation feedbacks.

The manuscript touches an important topic and is worthy of publication. I did not find

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any major flaws that would require substantive revisions. The article could benefit from a final discussion on what the findings mean for model development (e.g., Should we focus on better parameterizations? Is it useful to run high-resolution climate models if biases aren't really improved compared to lower resolution models?)

General Comments:

1. Especially the abstract and the beginning of the manuscript are well written. However, the manuscript becomes tedious to work through after about page 6. I think this may be just a reflection of the topic, since model validation studies tend to be tedious.
2. One of the points that makes the article tedious to read is that the authors switch between “low resolution” and “std-res” models. It would be easier if just one qualifier is chosen, in this case probably std-res (standard resolution).
3. The quality of the figures could be better. For example, the multi-panel map plots have lots of white space between the two columns, and lots of space is occupied by large colorbars. The individual panels could be enlarged at the expense of the wasted space.

Specific comments:

1. page 1, line 10: no comma after whereas
2. page 1, line 18: EU-funded
3. page 4, line 23: add “the” before Niño3.4 index
4. page 26, lines 11-12: add “the” before coastal Antarctic and Arctic

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2018-221>, 2018.

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