

***Interactive comment on* “Brief communication : Evaluating Antarctic precipitation in ERA5 and CMIP6 against CloudSat observations” by Marie-Laure Roussel et al.**

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Review of “Evaluating Antarctic precipitation in ERA5 and CMIP6 against CloudSat observations”, by Roussel et al (tc-2019-327)

General comments

In this useful short paper, the authors use a new climatology of Antarctic precipitation derived from CloudSat measurements to assess the representation of precipitation in the ERA5 reanalysis and the CMIP5 and CMIP6 climate model ensembles. They find that, relative to CloudSat, all models overestimate Antarctic precipitation and that there

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has been no significant improvement between CMIP5 and CMIP6. A somewhat surprising finding is that the higher-resolution subset of the CMIP6 ensemble appears to perform worse than the lower-resolution simulations over regions of complex orography such as the Antarctic Peninsula. This clearly warrants further investigation, but is outside the scope of the current paper.

The CloudSat dataset covers a relatively short time period (4 years), which raises questions about its representativity. However, the authors use a Monte Carlo approach to demonstrate that this is not a problem. With a little more work it might be possible to use this same approach to make a quantitative assessment of the statistical significance of the differences between models and observations.

I recommend publication of this paper following minor revisions.

Specific comments and technical corrections

Please see the attached annotated manuscript file.

Please also note the supplement to this comment:

<https://www.the-cryosphere-discuss.net/tc-2019-327/tc-2019-327-RC1-supplement.pdf>

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2019-327>, 2020.

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