

Review on Eliasson et al. 2018, "The Cloud_cci simulator for the ESA Cloud_cci climate data record and its application to a global and a regional climate model."

The authors developed a Cloud_cci satellite simulator in order to enable a precise comparison between satellite climate data records and climate model outputs. They have applied the simulator to EC-Earth a global climate model and RACMO a regional climate model and described the importance of such simulators, and the improvements in the comparison between model outputs and observations. The simulator will be very useful for the researchers who want to perform such model versus observational comparisons in future, as well as to address the future climate change related studies. So, I recommend the manuscript to be accepted for its publication in Geoscientific Model Development.

Minor comments:

The manuscript is written well, and the details provided are sufficiently described while discussing the appropriate sections, in general. However, if the authors can include a section where they would list or describe the known retrieval artifacts in AVHRR retrievals that would have an impact in CDR (apart from removing thin clouds. Its performance in high latitudes, heterogeneous cloud scenes, etc. It can have a reasonable impact on esp. daily composite). Expand the discussion on Page 6, Line 24-31. Similarly, describe EC-Earth's common issues. I am also curious, does the vertical resolution of the global model plays a role in reduced LCF (and the reduced high-clouds you described in Page 16.) during the EOT due to coarser-vertical model resolution assigning low-cloud into mid-clouds? For example: in Figure 4, over Pacific cold tongue, simulated low-level clouds are underestimated but overestimated the mid clouds. Any thoughts on it apart from the discussion you have provided in Page 16, Line#18-23?

Cloud_cci and CDR should be introduced in the Introduction section too.

Figure 3, left panel, clearly seems to have cloud regime dependent. The lower TCF values in the sampled model seem mainly over low-level stratiform dominant cloud regimes they have an explicit diurnal cycle. Have you checked the corresponding LCFs?

Typo: Figure 11. Maps of 2011-2014?

Also, in Figure 11, τ is in-cloud or all-sky average? Clarify, please.

Again Figure 11, regarding (n, r) and (o, s), have you checked if this is because Cloud_cci retrieval artifacts, underestimating τ and overestimating re retrievals. Have you looked at the results for different seasons? It would be good to discuss the LCF as well as mid-, and high-cloud amounts?

Have you run and check RACMO over other low latitude or stratocumulus domains? It would have been more interesting to see the results over such domain.