

First reply to Referee 1's review of the ACPD paper

” CLARA-A2: The second edition of the CM SAF cloud and radiation data record from 34 years of global AVHRR data”

by

Karl-Göran Karlsson et al.

Repeating general statement:

The manuscript "CLARA-A2: The second edition of the CM SAF cloud and radiation data record from 34 years of global AVHRR data" by K.-G. Karlsson et al. fits the scope of the journal and deserves to be considered for publication after some changes are made.

The paper is reasonably well written and understandable. Results and figures are provided with a sufficient quality.

Reply:

We thank the reviewer for this positive evaluation. We will reply to the specific comments below.

Repeating specific comment 1:

The manuscript contains several statements on the improvements of CLARA-A2 with respect to the previous version CLARA-A1. While this is fine and informative for potential users, such improvements are not sufficiently documented. Figure 2 presents a comparison, but there is not much more than this in the rest of the paper. The authors should consider adding some more material.

Reply:

Yes, we will present more inter-comparisons with CLARA-A1 results. For example, we did cloud product inter-comparisons based on CALIPSO observations for both data records for the period 2006-2009 which were not reported in the manuscript. We will add some of these results. Also for other CLARA-A2 parameters we will try to add more inter-comparisons against CLARA-A1. For example, Figures 7 and 11 will be updated with CLARA-A1 results.

Repeating specific comment 2:

The Section 7 seems to me a bit too quick. The analyses presented in the section (chiefly the one on the change of cloud conditions in the Arctic and Northern Hemisphere) are admittedly conducted as a very preliminary effort. However, even adopting this perspective, the material and figures are integral parts of the paper and would require more studies in order to be published. I am not in favour of including this part. Perhaps the space saved could be effectively allocated to address the previous point of this review.

Reply:

The recommendation from the reviewer to not present this part is obviously strong and should be obeyed.

At the same time, we added this section because we wanted to point out with some examples a couple of application areas which we found especially interesting. Also, we wanted the manuscript to include a little bit more of scientific discussion to justify it better in the ACP context (we have heard the argument that there are other journals more suitable for sheer descriptions of new data records). Thus, before taking the step to remove the section we want to have the opportunity to provide some more arguments (including the previously mentioned). After having provided that, we will wait for a final recommendation from the reviewer.

The Arctic surface albedo plots were kind of natural to include with respect to the ongoing concern about the observed reduction of summertime Arctic ice coverage. The new thing here was that it would in our opinion be interesting to also relate it to changes in Arctic cloudiness. Both parameters are available in CLARA-A2 and we just wanted to point that out. The cloud results are certainly not as conclusive as the surface albedo plots but this is nevertheless an interesting piece of information pointing out that ice melting processes do not seem to be directly and highly correlated with changes in cloud cover. The results as such cannot be considered as preliminary (the choice of word here is unfortunate) since they have been produced in exactly the same manner as the surface albedo results, i.e., by use of all monthly averages over the studied period. So, these are final CLARA-A2 results and not preliminary ones. However, this is only a first observation based on monthly and yearly averages which could be complemented by more detailed studies also including additional information (e.g circulation patterns, warm/cold advection conditions, cloud types, etc) to enable a deeper analysis.

Regarding the other example (about global 25-year average trends of cloudiness) we have similar arguments. We just repeated the study (or parts of the study) in the Norris et al. 2016 paper to see what happens if we add another 7 years to the 27 years that they studied. There are obviously differences but also similarities so it is clear that it is difficult to find very clear conclusions. However, the indication that the cloud changes seen by Norris et al., 2016 for mid- and high-latitudes (and which were specifically high-lighted in the conclusions) are maybe not as clear in our study despite having several additional years which would reasonably give better prospects of finding a long-term trend. This would actually call for further and deepened studies here. For this reason we still think this addition to the paper is interesting.

We'll await a final recommendation on the potential removal of Section 7. If that recommendation stands firm we hope that we can at least use the figures (both or one of them) to further illustrate the product groups of clouds and surface albedo in sections 4 and 5.

Repeating specific comment 3:

The black/blue colour choice of the dots in the figure (Figure 12) makes them difficult to spot.

Maybe a black/red choice would do the job much better.

Reply:

Figure 12 will be revised to increase readability.

FINAL REMARK:

A new version of this document will be made available after the manuscript is revised. The new version will verify exactly the changes which were made in the final manuscript.