

Atmos. Meas. Tech. Discuss., referee comment RC2
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review of amt-2021-391

Anonymous Referee #1

Referee comment on "Evaluating the consistency and continuity of pixel-scale cloud property data records from Aqua and SNPP (Suomi National Polar-orbiting Partnership)" by Qing Yue et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-391-RC2>, 2022

This is a review of the manuscript titled "Evaluating the 1 Consistency and Continuity of Pixel-Scale Cloud Property Data Records From Aqua and SNPP" submitted to AMTD by Yue et al.

The paper describes results of several cloud retrieval algorithms applied to spectral imagers (MODIS and VIIRS) and infrared sounders (AIRS and CrIS). The focus is specifically on the continuity algorithms that are designed to be applied to both MODIS and VIIRS and AIRS and CrIS.

The paper is well written. It will be interesting for researchers using the continuity products and for a general understanding of differences in cloud retrieval products. I would recommend publication of the paper after consideration of the following comments.

Main comments:

- The algorithm descriptions could have a few more details, especially for the imagers. For example, the different shortwave infrared channels used by MODIS and VIIRS have 'implications' as mentioned in line 218, but I suggest to briefly explain what they are for liquid and ice cloud effective radii retrievals. Also, some brief description on the "differences in LUTs" that are mentioned on line 241 would be good. It is also unclear to me what the difference between CLDPROP and MYD06 ice phase algorithm is. It is stated on line 241 that CLDPROP "removes the dependence on the cloud top solution method in MYD06." Do you mean it does not rely on cloud top height?
- I would suggest to separate ice-only and liquid-only FOVs in figures 7, 8 and 9. Alternatively, these could be provided in a supplement and the differences in results for ice-only and liquid-only FOVs can be discussed in the paper. Especially ice crystal

absorption is much weaker at 2.25 micron compared to 2.13 micron, so there could be greater differences for ice clouds between MODIS and VIIRS than for liquid clouds.

- Related to this, I wonder if there also are differences between ice-only and liquid-only FOVs in the sounder to sounder and the sounder to imager comparisons. Could you at least comment on that?

Minor and specific comments:

- Line 114: I suggest to include an outline of the paper as is customary.
- In Table 1, I'd suggest to include the spatial resolution of the products
- In table 1, I suggest to spell out NSR and FSR, so it's clear what the difference is between those two rows.
- Figure 1 and 2: The yellow lines are very hard to see, especially the dashed one. I suggest to use a different color.
- Figures 5 and 6: The addition of the magenta lines make the middle panel plots very busy, and the number indicating the contour line values are almost impossible to read. These should be made more clear. Making these panels bigger might help.