Interactive comment on "Cloud property datasets retrieved from AVHRR, MODIS, AATSR and MERIS in the framework of the Cloud_cci project" *by* Martin Stengel et al.

Anonymous Referee #1

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Review comments on manuscript "Cloud property datasets retrieved from AVHRR, MODIS, AATSR and MERIS in the framework of the Cloud_cci project"

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General comments:

This paper presents the cloud property dataset as a result of the Cloud_cci project. The dataset includes products such as cloud optical thickness, effective radius, thermodynamic phase, cloud top pressure/height/temperature, liquid/ice water path and spectral

albedo, which are retrieved using AVHRR, MODIS, ATSR2, AATSR, and MERIS observations with the optimal estimation technique. This unified dataset will be helpful for long term cloud/climate related studies. The materials are presented well. I recommend publication of the paper after some revisions listed below.

One general concern I have is about the justification for generating this dataset. For each of the sensors/mission used in the paper, there exist corresponding mature retrieval datasets, which are validated and widely used by the community. One can understand the new dataset presented by the paper applied self-consistent algorithms to all the sensors, which is definitely a desirable thing to do, but the ultimate goal is to have a dataset with higher quality than the existing ones. I would suggest the authors to include results or at least a further discussion on why the new dataset is better than a congregation of each of the individual dataset. This could be achieved through showing that either the quality of the new dataset is better or the new dataset can be used for work that cannot be done otherwise (may be due to the inconsistency of algorithms).

Specific comments:

1) P1, Line 15 in Abstract: "though" suppose to be "through"

2) P3: "developing physical retrieval systems for cloud properties with spectral consistency over all utilized bands". Take the 36-channel MODIS as an example, how many bands are utilized and how is the spectral consistency achieved?

3) P5, Line 5 in Section 2.1: "night-time node)" unmatched ")"

4) P15: regarding the offsets between the datasets shown in Fig 8. It's puzzling to me why "they appear to be related to differences in the spectral characteristics of AVHRR heritage channels", as the spectral response functions should have been applied in the radiative transfer calculations. Could it be a calibration issue?

5) P19: Fig. 6g: should be "cloud ice water path"; the word "ice" is missing in the color bar.

6) P28, Line 23: "surface)", unmatched ")"