

Interactive comment on “Quality assessment and improvement of the EUMETSAT Meteosat Surface Albedo Climate Data Record” by A. Lattanzio et al.

Anonymous Referee #2

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The EUMETSAT MSA CDR covers a long period of time (24 yrs) and uses geostationary observations different from what other albedo data sets (i.e. CLARA-SAL and MODIS) use. It could become a valuable resource to study long-term surface radiation budget. This manuscript tried to assess the constituency and quality of this dataset and explore the method to reduce the cloud contamination. While its topic appears interesting to the readers, its current form was not well written and not ready for publication. Several major issues need to be addressed before acceptance for publication.

1. The structure needs to adjust. The introduction section failed to review the relevant literature and properly link this study to the existing literature. After reading the introduction, I hardly understand the necessity and goals of the study. The authors did not mention the aims of the study until the third section (L87, L99). After that, L90–

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97 abruptly summarized the outcome of the study. This part should be moved to the conclusion section.

2. As an assessment study, this manuscript used only limited validation datasets. In terms of in-situ measurements, only one site from SAFARI was selected. Have the authors checked other flux networks, i.e., BSRN, FLuxnet? With regard to peer satellite products, albedo data from another geostationary satellite were used. I think comparison with MODIS and/or CLARA-SAL will be of greater interest to the readership. The datasets are well validated and used extensively by many users.

3. The presentation of the methodology and results needs improvement. Let us still use the comparison with SAFARI data as example. Many details about the data and processing are missing: how is albedo measured and calculated? What is the quality of in-situ measurements and is there any quality assurance applied? Are measurements of the entire day used to calculate albedo for the day? The authors also ignored the difference between blue-sky albedo (SAFARI) and white/black-sky albedo (MSA ACP). The blue-sky albedo can be easily calculated from DHR and BHRiso of MSA ACP, because aerosol load is jointly retrieved with surface albedo. Comparison results were plotted in Figure 8 and 9, but little discussion was given in the text. More importantly, the comparison results were not quantified (i.e., bias, standard deviation).

4. Results of consistency assessment were documented in Table 3 and Figures 1-4. The analysis and discussion about the results are insufficient. The signs of the regression slopes are different across location. What are the possible reasons behind positive/negative slopes? It is true the overall intra-annual variations are generally smaller than 0.01/decade. However, the intra-daily variations from one retrieval to another are significant. Variations of BHR_iso are greater than those of DHR. These issues were not touched in the discussion.

5. T in EQ(3) and 3 in EQ(1) are two important thresholds for the new cloud removal strategy. The authors need to explain how the parameters were set and how they could

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affect the cloud removal.

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