

Interactive comment on “Replacing Missing Values in the Standard MISR Radiometric Camera-by-Camera Cloud Mask (RCCM) Data Product” by Michel M. Verstraete et al.

Anonymous Referee #1

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Review for "Replacing Missing Values in the Standard MISR Radiometric Camera-by-Camera Cloud Mask (RCCM) Data Product"

This paper is well-written and easy to understand. It describes a sequential approach to using multiple MISR cameras and a single MISR camera to replace missing data in the MISR RCCM product. The approach is implementable based on the methods presented in the paper but implementing it is unnecessary because all of the software is open to the public via GitHub. The paper and underlying research have benefits in terms of both accessing and improving MISR data products. All of my comments below are of a minor nature.

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Minor Comments:

1) On Line 11 of Page 8 the words "might prove useful" are found and just below on Line 18 the words "may be useful" occur. This is a weak motivation for the study. Reading between the lines, it would seem that the local mode site over Sukuza absolutely required development of this software in order to make the RCCM data useful at this location. Is this true? If so, motivate the study by stating that missing data must ("must" is strong; "might" is weak) be replaced to execute some studies. This software was developed to this end and its public availability will facilitate future studies using MISR data. If the statement above is not true, at least for some demonstrated studies, motivation for the algorithm remains weak.

2) On Page 14 the words "successfully" (Line 6) and "rate of success" (Line 7) occurred. Missing values have indeed been replaced by estimates but to attach the words "success" to them one must demonstrate that the estimates are correct. This leads to the question as to how to assess the "correct replacement percentage" as opposed to the "replacement percentage" produced by the algorithm. As the manuscript now stands, this point is not addressed. The "correct replacement percentage" will certainly depend on the cloud type. How about using many, many different cloud types over Sukuza and/or neighboring regions for which there are no missing data and then removing lines and pixels in a way that captures the statistics of the missing data at Sukuza and for a variety of cloud types. Then, one would be able to assess algorithm accuracy by replacing the missing data and then comparing it to its truth. This does not seem like a hard exercise to do and it, or something like it, would demonstrate the success rate of the replacements, thereby providing confidence in the algorithm. It would seem that a broken cloud field with a lot of edge pixels would lead to the worst performance. So perhaps limiting assessment to a single cloud field of this type would demonstrate algorithm accuracy in a worst case scenario.

Details:

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- 0) The marked up manuscript returned to the authors contains suggestions and questions on really minor details that the authors may want to consider.
- 1) Lines 12-13, Abstract: Maybe "for replacing missing values in the MISR RCCM data products" would be better than "to process MISR RCCM data products".
- 2) Page 5, Line 13: "RCCM to be missing over land". Is the "over land" necessary in this statement? Why not ocean too?
- 3) Page 5, Second Sentence of Figure 2 caption: Is this sentence necessary?
- 4) Much of the discussion on Page 6 regarding the scenes would benefit from having a figure that shows where the blocks are located relative to underlying topography and water.
- 5) Page 8, Line 17: The reference to "type 3 and 4" is not perfectly clear because it falls under a paragraph on the same page with an itemized list with 3 items. Perhaps back on Page 4, Line 17, the words "four cases" could be replaced by "four types" and then the list of types could be labeled Type 1, Type 2, Type 3, Type 4. In this way use of the word type would be tied closely to this list.
- 6) Page 9, Lines 9-10: This sentence needs to be rewritten. How about "As indicated above, this MISR RCCM data product assigns a "No Retrieval" 0B value to all RCCM pixels corresponding to MISR L1B2 radiance values associated with an RDQI other than 00, independently of the value of the data quality indicator." Note that as the text now stands a value of 0B is associated with the RDQI but this is inconsistent with its values listed on Lines 15-18 on Page 3. This mix-up occurs in a number of places. I caught a few places but the authors may want to make sure that mix-ups are eliminated.
- 7) Page 13, Line 11: "Figure 4" is not correct in this last line on Page 13. It should be "Figure 5".
- 8) Page 14, Figure 10 caption: "Figure 4" should be replaced by "Figure 5" in the caption.

9) Page 15, Line 6: "0B" should be "00" for consistency with earlier definitions.

10) Page 15, Line 11: "1B" should be "01" for consistency with earlier definitions. Same issue on Line 14 of Page 5:

11) Page 15, Line 15: "The first two processes" might be better as "The first two types".

12) Page 16, Line 16: "HR" has not been defined previously.

Please also note the supplement to this comment:

<https://www.earth-syst-sci-data-discuss.net/essd-2019-77/essd-2019-77-RC1-supplement.pdf>

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-77>, 2019.

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