Review of AMT_2021_377 "DARCLOS: a cloud shadow detection algorithm for TROPOMI" by Trees et al.

The revised paper discusses the DARCLOS cloud shadow detection algorithm, and applies it to TROPOMI radiances. The algorithm is clearly explained and the paper is well written, and should be published after minor suggested clarifications.

General points

Page 23, line 500
If the information is available, specify the general pathnames of the TROPOMI level 2 files for which the PCSF, ACSF, and SCSF flags are included, and specify the variable names that are used in the files.

Page 23, line 505
Specify in the text the percent frequency of occurrence for which the PCSF overestimates cloud shadows.

Minor points

In the Figure 5 caption the sentence "Here, all measurements are cloud-free" is ambiguous (not clear). Please clarify.

Page 12, line 298.
Suggest to replace with "introduced above (Sec. 3.1)"

The longitude-latitude entries in Table 1 have a different range than the Figures. Clarify in the text.

Criteria

1. Does the paper address relevant scientific questions within the scope of AMT? Yes

2. Does the paper present novel concepts, ideas, tools, or data? Yes, the authors point out that DARCLOS is the first cloud shadow detection algorithm for a spaceborne spectrometer.

3. Are substantial conclusions reached? Yes

4. Are the scientific methods and assumptions valid and clearly outlined? Yes

5. Are the results sufficient to support the interpretations and conclusions? Yes

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes, the Introduction does a good review of the literature.

8. Does the title clearly reflect the contents of the paper? Yes

9. Does the abstract provide a concise and complete summary? Yes

10. Is the overall presentation well-structured and clear? Yes

11. Is the language fluent and precise? Yes.

12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes.

13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? The comments above discuss a few minor suggested clarifications.

14. Are the number and quality of references appropriate? Yes

15. Is the amount and quality of supplementary material appropriate? Not applicable.