

Response to comment of Anonymous Referee #3 on “DARCLOS: a cloud shadow detection algorithm for TROPOMI” by Victor Trees et al.

Victor J. H. Trees^{1,2}, Ping Wang¹, Piet Stammes¹, Lieuwe G. Tilstra¹, David P. Donovan^{1,2}, and A. Pier Siebesma^{1,2}

¹Royal Netherlands Meteorological Institute (KNMI), De Bilt, the Netherlands

²Delft University of Technology, Delft, the Netherlands

Correspondence: Victor Trees (victor.trees@knmi.nl)

We thank the reviewer for his/her careful reading and for the comments and suggestions, which have improved the manuscript. Below, we give in *blue italic* the reviewer’s comment, in black our response, in *black italic* copied text from the manuscript and in *red italic* the changed or new text in the manuscript.

5 *General points*

- *Page 23, line 500: If the information is available, specify the general path names 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.*

The path names and final variable names of the shadow flags in the TROPOMI level 2 files are not yet determined.

- *Page 23, line 505: Specify in the text the percent frequency of occurrence for which the PCSF overestimates cloud shadow*

10 We have added the PCSF commission error (representing the overestimation by the PCSF) to Table 1, and modified the following sentence in the text as follows:

Page 20, line 426: *"The fourth and fifth column of Table 1 show ϵ_O and ϵ_C , respectively, of the PCSF. The value of ϵ_C of the PCSF is higher than 0.48 and higher than that of the ACSF, ..."*

Minor points

- 15 – *In the Figure 5 caption the sentence “Here, all measurements are cloud-free” is ambiguous (not clear). Please clarify.*

We modified this sentence as follows:

Here, all measurements are cloud-free. → Here, all measurements are cloud-free (i.e., without CF).

- *Page 12, line 298. Suggest to replace with “introduced above (Sec. 3.1)”*

We modified this sentence as follows:

20 *"introduced above (Sec. 3.1)" → "introduced in Sect. 2.2.4 (Sec. 3.1)"*

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

We have added the following to line 394:

"For the ACSF in a slightly larger area than shown in Fig. 11a (36.5 - 43.0 °N, 76.0 - 88.0 °E), ... "