

Earth Syst. Sci. Data Discuss., referee comment RC1
<https://doi.org/10.5194/essd-2021-237-RC1>, 2021
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Comment on essd-2021-237

Anonymous Referee #1

Referee comment on "Global GOSAT, OCO-2, and OCO-3 solar-induced chlorophyll fluorescence datasets" by Russell Doughty et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-237-RC1>, 2021

Comments:

This manuscript presents a comprehensive description on the global L2 SIF Lite datasets of GOSAT, OCO-2 and OCO-3 satellites, which will be useful for users to fully utilize these data products. However, there are several issues that I still concern and recommend a major revision before publication.

Firstly, throughout the manuscript, the authors say that you describe the L2 SIF V10 data from GOSAT, OCO-2 and OCO-3. However, I don't find the GOSAT dataset following the Section 7, which gives the websites of these SIF datasets. Besides, only the version of OCO-2 data was v10. Therefore, what SIF dataset of GOSAT you used in this study? Please give detailed descriptions.

Secondly, as the authors said that the data description in this paper is an update and synthesis of several user guides, publications, and supplementary materials. Moreover, other works including bias correction, SIF retrieval methods, the calculation of SIF retrieval uncertainty and so on, were conducted like the same as the previous works. So what is the innovation of this work, or is there any new work compared to the previous

work instead of a summary of the previous works?

Thirdly, the authors stated that the methods used to retrieve SIF were also outlined in the paper. However, the detailed SIF retrieval methods of three platforms were not presented in Section 4.1. Also, the differences of retrieval methods used on GOSAT and OCO-2/3 should also be given out.

Finally, I think the conclusion is a little perfunctory. The conclusion seems to only emphasize the advantages of OCO-2/3 platforms. In addition, I don't find the innovative points in this manuscript.

Specific:

Page 1:

Line 24-30: The authors may need to add some references here.

Page2:

Line 32: How to judge whether it is extreme light condition? Please give detailed descriptions.

Line 51-52: I can not understand the causal relationship between this sentence and the previous contents.

Line 56-57: The authors should add the related references about GOSAT and OCO-2.

Page 2 Line 63-Page 4: I don't think these contents should belong to Introduction Section instead of Data description Section.

Figure 1 and 2: We can observe obvious differences on sounding coverages between OCO-2 and OCO-3 from Figure 1 and 2. What differences on orbital imaging modes between them?

Page 5

Line 92-93: This description is not very suitable here as not only Fraunhofer lines but O₂ absorption lines could also be used for SIF retrieval.

Line 97: Please check the unit of W/m²/sr/um throughout the manuscript.

Line 102-108: The introduction of spectral ranges of GOSAT was absent.

Line 106, 113: Please point out the referenced radiance level and specified wavelength of the given SNRs.

Line 113: signal-to-noise ratio ->SNR; please check the font format throughout the manuscript.

Page 8:

Line 205-209: Please provide the detailed criterion thresholds instead of criterion variables only.

Page 9:

Line 222-223: Actually, the spectral shape of SIF spectrum is not invariant and will vary with physiological factors and canopy structure, etc.

Eq.1: What is the basis for the chosen ratios? Please give a detailed analysis.

Page 11:

Line 274: Why you chosen a 0.20-degree?

Line 291: ere?

Line 289,294: The expressions of SIF_{daily} and Daily_SIF puzzled the readers.

Page 14:

Section 5.4: What are the differences between gridding the data and averaging the data soundings at large spatial scales? In my opinion, the sounding-level information could not be used after averaging them in large spatial and temporal scales.

Page 15:

Line 378: "the use of SIF757 at would be more...?"

Figure 5: What temperature data were used? And what the basis for selection of temperature of 5° as a threshold? Please give out the detailed information.

Figure 5 and 7: Please modify the superscript format of R^2 in the figures throughout the manuscript.

Figure 8: Why you chosen the 4.0 degree?