Interactive comment on "Preliminary verification for application of a support vector machine based cloud detection method to GOSAT-2 CAI-2" *by* Yu Oishi et al.

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Review of research article Preliminary verification for application of a support vector machine based cloud detection method to GOSAT-2 CAI-2

Submitted to Atmospheric Measurement Techniques (AMT)

Disclosure: I reviewed the original submission of this manuscript to Remote Sensing of the Environment in November 2017

Summary of Article This paper provides an analysis of the performance of the proposed cloud screening algorithm to be used for the upcoming GOSAT-2 satellite. The new al-

gorithm, called CLAUDIA3, is based on support vector machine, which was introduced in a separate paper. The current work focuses on analysis over tropical rainforests, which are of primary concern with respect to the global carbon cycle. The key finding is that the new CLAUDIA3 algorithm is slightly more accurate over tropical rainforests when compared to the CLAUDIA1 algorithm that is in operational use for GOSAT.

Review Recommendation The overall scientific nature of the paper is valuable and appropriate for publication in AMT. The authors mostly do a good job of providing necessary details that would allow other researchers to replicate the work, such as providing the exact GOSAT CAI frames used in the analysis. There is one exception to this, which is my Major Comment below. It is a specific, technical based report that will be of interest to other researchers in the field of short wave remote sensing of trace gas concentrations and cloud and aerosol screening. I think it will be appropriate for publication after the authors address Major Comment 1 below.

Major Comment 1 I reviewed the original submission of this manuscript to RS in November 2017. Although the paper has been much improved since that time, my primary constructive comment of the current version of the paper is that it is still not clear to me exactly what the authors mean when they use the term "manual by eye" cloud screening. It might be implying that the various algorithm thresholds set to distinguish clear from cloudy are set manually prior to running the CLAUDIA algorithm on the CAI L1b radiances. Otherwise the authors are suggesting that they selected each of the 160,000 pixels in each frame as either cloudy or clear. This would be faulty for at least three reasons. One being that it would take an eternity to perform. Also, it would not be reproducible. Third, the inspection of RGB images by eye cannot be relied upon to distinguish clear from cloudy since the human eye is not sensitive in the same way as the computer algorithms.

So the authors need to very distinctly describe how the "manual" selection of clear/cloudy is performed. If it is the later case (actually performed by eye, pixel by pixel) then the paper should be rejected, or at the minimum, the comparison to the "by

eye" technique completely removed. It is still a valid exercise to directly compare the CLAUDIA3 results to CLAUDIA1 and/or to MODIS. The statistical analysis using the "accuracy", "overlook" and "overestimate" metrics is prudent and easy to interpret.

Some minor comments are given in the attached PDF. I didn't provide as many minor/technical comments as I could, since I've now reviewed this article twice!

Please also note the supplement to this comment: https://www.atmos-meas-tech-discuss.net/amt-2017-464/amt-2017-464-RC1-supplement.pdf