

## ***Interactive comment on “Leveraging spatial textures, through machine learning, to identify aerosol and distinct cloud types from multispectral observations” by Willem J. Marais et al.***

**Willem J. Marais et al.**

willem.marais@ssec.wisc.edu

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We thank the reviewer for the time spent on reading the paper in detail and providing us with helpful feedback. Here are the response to some of the specific comments:

Comment: line 185 I do not see L and K defined. At this point of the paper, the reader gets a bit lost in the maths (at least I did). Please see if you can keep it more discursive and easier to read. I would suggest putting the mathematical details of the algorithms in an appendix.

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Response We rewrote parts of sections 2.1.1 and 2.1.2 to make these more accessible to the reader.

Comment: line 223 It might be rather arbitrary to recognize clouds at different altitudes from the True Color images. Could you comment on that. Further down, figure 6 makes this point: how can you be sure that that's a cirrus cloud?

Response: The person who does the labeling through the adapted NASA Worldview website can use the 11  $\mu\text{m}$  radiances to assess whether there is a high altitude / cirrus cloud. If it is unclear to the person who does the labeling whether a cloud is a cirrus cloud, the cloud top pressure retrievals can also be consulted to help the person make the decision. We added text near line 223 to make this point clearer.

Comment: Section 2.5 is difficult to read. Some details could perhaps be given in an appendix and the text in the paper made more fluid.

Response We attempted to make this section more readable or move it to the appendix.

Comment Section 2.5.3 is a bit too concise. Please expand.

Response This section has been expanded.

Comment: Line 365 Yes, the edges are problematic. Please spend a few words in saying how you will address this problem in future work.

Response We added text to explain how this problem will be addressed in future work.

Comment: Line 428. This is not the focus of this paper, but are there other studies confirming the inconsistency that you see between MODIS and CALIOP data?

Response There are a number of such studies; we added the following citations: “Improving the CALIOP aerosol optical depth using combined MODIS and CALIOP observations and CALIOP integrated attenuated total color ratio”, by Min Oo and Robert Holz, 2011 “Comparison of aerosol optical depth between CALIOP and MODIS-Aqua for CALIOP aerosol subtypes over the ocean”, by Man-Hae Kim, Sang-Woo Kim, Soon-

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Chang Yoon, and Ali H. Omar, 2013

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