

This manuscript is acceptable after some revision. I would strongly recommend stating the goals of the work more explicitly up front. A paragraph at the end introduction would go a long way to addressing this. Tying these observations and retrievals together at the beginning of the paper will help the reader through the rest of the work. That comment and other more minor comments are below.

Page 2 : Line 4 Remove the second “and”

Page 2 : Line 4 Can I assume that both instruments are pointing in the nadir? If so, reword this sentence to reflect that fact.

Page 2 : Line 10 Time delays aren’t the only problem. The in-situ observations won’t get the profile at the instant that the remote sensing observation is being made.

Page 2 : Line 14 I don’t think “However” is quite the right word here.

Page 3 : Line 1 I’d swap the order of “and climate change is particularly strong” and the first point the boundary layer clouds. It will flow a little better with the clause “as shown by...” hanging off the end.

Page 4 : Line 2-3 I would add a paragraph at this point discussing the specific goals of the work and this paper. The transition feels a bit abrupt to me. I don’t believe the manuscript addressed why you were applying both the 2-wl and 5-wl methods. I would use the introduction to do this. You can also tie in the use of these results to the hyperspectral image retrievals.

Page 4 : Line 7 Was this really meant to be a new paragraph? I don’t think it should be. This happens again on Page 5:Line 3.

Page 5 : Line 5 Delete “own”

Page 8 : Line 16 ...in *the* form...

Page 8 : Line 21 When you say “a significantly lower retrieval”, I think you mean a lower frequency of these low tau values (or something to that effect, yes?).

Page 11 : Line 5-6 Similar to my comment before in the abstract, the time delay is only part of the problem. With two aircraft you’re still only going to get the size information at 1 level in the cloud.

Page 12 : Line 22 I would again recommend adding the goals of the work to the introduction and then incorporating that theme here at the beginning of the conclusions to tie them together. It will help the overall flow.

Figure 2 I would list in the caption the wavelengths where the red crosses are marked rather saying “exemplary wavelengths”.

Figure 4 It may be helpful to state explicitly that the aircraft was heading South (assuming that I’ve interpreted it correctly).

Figure 5 With the optical thickness changing a factor of 4 or 5, it would be better to show the change in optical thickness as a percentage.