Date: 04 January 2021

Purpose: Reply to AE

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Specific comments:

1. In the abstract (page 1, line 18). Should the "or" between "layer" and "TPW" be deleted?

Yes; deleted.

2. Page 13, Lines 19-21. I am confused by "cool Tbs associated with smoke may be confused with cool, elevated, land surfaces". Can you elaborate on the relevance of this statement since the bulk of the analysis in the manuscript occurs over the ocean?

I agree that there appears to be a strained connection between a discussion of smoke over land and a discussion of smoke over the eastern Atlantic Ocean. My goal is to provide a reader with a complete description of satellite detection of smoke, as opposed to an ocean specific discussion. As such, I did make a small modification of the text as follows: “Based on previous satellite observations, Hillger and Ellrod (2003) have shown that smoke layers were undetected in values of infrared channel differences. In an attempt for this manuscript to provide a more complete background of satellite detection of smoke, Hillger and Ellrod (2003) also showed that if a layer of smoke is optically thick enough in infrared bands, Tbs of smoke will appear cool and may be confused with cool, elevated, land surfaces.”

3. Page 22, Line 7-8. "However, both methods relied on measurements of reflected solar energy...". CALIOP is an active sensor that relies on transmitted laser energy to detect the vertical distribution of aerosol and cloud layers using backscattered signal. CALIOP actually has better performance during the night because there isn't any solar contribution to the measured signal. Please consider revising/rephrasing this section of the paragraph.

Yes, my mistake. I changed the text from

“As discussed above, GeoColor imagery and the CALIOP instrument on CALIPSO detected dust in the SDR. However, both methods relied on measurements of reflected solar energy; as a result, dust will go undetected after sunset in the SDR. However, dust in the NDR was not only detected, but also tracked after sunset.”

to

“As discussed above, GeoColor imagery detected dust in the SDR. However, GeoColor imagery relied on measurements of reflected solar energy; as a result, dust will go undetected after sunset in the SDR. However, dust in the NDR was not only detected, but also tracked after sunset.”