

# ***Interactive comment on “Satellite Imagery and Products of the 16–17 February 2020 Saharan Air Layer Dust Event over the Eastern Atlantic: Impacts of Water Vapor on Dust Detection and Morphology” by Lewis Grasso et al.***

**Anonymous Referee #1**

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This study examined the detection of dust aerosols in a Saharan Air Layer using ABI, VIIRS, and CALIOP products during a dust event in Feb. It is found that channel differences can largely detect dust in the northern region over the eastern Atlantic where water vapor is relatively low but cannot detect the mixture of smoke and dust in the southern region, where total precipitable water is high. The finding provides observational evidence to support recent modeling studies of water vapor masking the infrared detection of dust. The paper is overall well written with detailed information about infrared dust detection and thorough analysis. I only have a few suggestions for the

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authors to consider before publication.

Specific comments:

1. While it is nice to add discussions about the implication of dust detection techniques in aerosol assimilation and weather forecast (sections 4-5), some details (although quite informative) are not very relevant to this study (e.g., lines 5-11, page 23). I suggest shortening these parts to keep the paper concise.
2. The paper discussed a lot of detailed aspects of infrared detection of dust, while most of them are very useful I think some content is not the main focus of this study and can be cut down. For instance, the discussion about whether air temperatures can explain the lateral changes in Tbs can be shortened (lines 19-24, page 13, lines 6-17, page 14), since the main hypothesis is that total precipitable water plays a major role.
3. Can you add some discussion about whether smoke may affect the detection of dust in the south region (along the black dashed line) in channel difference in Fig. 5?

Minor comments:

1. Which color indicates the negative value in Fig. 7a, light blue?
2. Is it possible to enlarge the font size of labels in Fig. 17? Can you add the information about green, white, red contours in the figure caption?
3. Lines 16 and 18, acronyms NRD and SRD are used but later NDR and SDR are used.

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