

Interactive comment on “The sensitivity of the colour of dust in MSG-SEVIRI Desert Dust infrared composite imagery to surface and atmospheric conditions” by Jamie R. Banks et al.

Anonymous Referee #2

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This study examines under which conditions North-African desert dust can be distinguished in infrared RGB imagery from MSG-SEVIRI. The authors demonstrate that dust is in many cases not visible, in particular if the surface skin temperature is low, the atmosphere is moist or the dust is located close to the surface.

The analysis is based on a state-of-the-art modelling system and has been carried out in a very systematic way. The paper is clearly structured and excellently written. My only concern, apart from some minor specific comments listed below, is that the scope of the study should be better defined and motivated. The study is confined to northern African land, but Saharan dust is transported over the Atlantic Ocean and Europe.

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What about the capabilities to detect dust in these regions, where the surface and atmospheric conditions (as well as the satellite viewing angles) are markedly different? The study is furthermore confined to two summer months. What about the rest of the year?

Specific comments:

Page 2, line 4-8: Can you mention a concrete example of a feedback loop?

Page 3, line 6-8: It is not clear to me what the significance of this statement is for the current paper.

Page 5, line 9: Is the solar zenith angle relevant here?

Page 5, line 14-15: I understand that you focus on cloud-free scenes, but it would be useful to say a few words about the signature of clouds in the imagery. And what about scenes with both clouds and dust?

Page 7, line 34: What does ‘these’ refer to?

Page 10, line 20-22: Can you explain why the thickest dust storms are located low in the atmosphere while lower loadings occur more frequently at higher elevations? Is it simply because the thickest loadings occur close to the (storm) source region and so have not had time to reach higher altitudes?

Page 16, line 21: The imager on MTG (FCI) will have somewhat different infrared channels than SEVIRI. For the three channels used in the desert dust RGB, the central wavelengths will move from 8.7, 10.8, and 12.0 micron to 8.7, 10.5 and 12.3 micron, respectively. Is there something to say about whether and how this will impact the detectability of dust?

Page 26: Could you add in the caption of Fig. 2 what the white patches correspond to. I assume there is no data because of nearby water surfaces, but there are also some white patches in the middle of the Sahara. Are these oases?

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