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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aircraft and ground measurements of dust aerosols over the West Africa coast in summer 2015 during ICE-D and AER-D" *by* Dantong Liu et al.

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General Comments:

This paper is logical, well written, and provides interesting new results on the properties of Saharan and Sahel dust off the coast of Africa. A variety of types of data are integrated in a meaningful way. It was a pleasure to read and should be published after minor revisions suggested below.

Specific Comments:

Abstract: It would be helpful to convey here that the transport is over both land and

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water (and mostly land?), since other studies focus more on transport across the Atlantic. Also, it should be mentioned that the "processing" discussed throughout does not include cloud processing, assuming that is the case (see below).

Line 27-28: Specify if this is true for all cases, or just Sahel.

Page 5, line 24-25: This is an Ice in Clouds Experiment–but clouds are only mentioned as having been screened out. So are the data presented here only representative of dust evolution in clear air? Or were there sometimes clouds upstream that may contribute to dust evolution?

Page 7, lines 22-24: Need more quantitative information/references on this potential enhancement in the Rosemount inlet, as well as the diffusional losses and how they may affect your size distributions.

Figure 2: Horizontal scale on RHS needs minor tick labels.

Page 8, lines 18-20: This was the only confusing part in the paper, and Fig 3 doesn't help much. The mode at larger incandescent signals appears to be at higher Tc, not lower, but maybe I'm misinterpreting what you mean by modes. Perhaps circle modes and/or use arrows? Also, it's not clear what the boxes labelled BC and Hematite are referring to. I think it may be values above and below the horizontal lines, but these lines are almost indiscernible, especially on figure on the right.

Page 9, line 20-21: What do you mean "scaled up"? Corrected for low detection efficiency? Perhaps the discussion on p. 10 about the low detection efficiency at 0.5 microns should be moved up to this section, when you discuss the figure that shows no hematite at small sizes.

Page 11 line 1: Vague; define what you mean by "considerable processing".

Page 13, line 15: Unclear why the number of days over each region is so uncertain. Is it due to trajectory uncertainty, or uncertainty in where the dust originates?

Fig 7D: Mention in legend that vertical bars are standard deviations, assuming this is the case. Also, why are there blank periods in C and D? In cloud?

Fig. 9: Is there a way to specify the number of days over land vs over water, and whether this may have any effect on your results?

Page 19, line 10: Define “low”, as low relative to the SAL may not be low in other regions. Page 20, line 9: Define what you mean by “processing”.

Page 21: Chen et al, ACP 2011 provided a comprehensive review of SAL optical properties and would be a useful reference here.

Page 21, line 19-20: Nice result.

Fig. 19: For the non MBL cases, it would be nice to also see the primary airmass origin.

Typos:

Page 18, line 8: Composition is misspelled.

Page 21, line 20: influenced is misspelled.

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