

## ***Interactive comment on “Atmospheric radiative effects of an in-situ measured Saharan dust plume and the role of large particles” by S. Otto et al.***

### **Anonymous Referee #1**

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The key issue addressed in this paper, namely the effects of a relatively small number of large particles on atmospheric radiative effects, is one which received insufficient attention in the literature, although there has been some belated recognition in recent years. The systematic analysis presented in this paper is pleasing to see.

I think there is too much vertical structure in figures 9 to 14. Firstly, the vertical profile of optical properties is based on measurements at 8 levels, so that a smoother interpolation might have been assumed. Secondly, the reader's eye is drawn to this structure, rather than the different lines representing the different cases which are central to the thesis of the paper. These are the 'take home message' of the work.

Instead of referring to the panels in figures 5 etc as “above” and “below”, it would be

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better to use (a) and (b), or “upper” and “lower”.

Section 4.2.6 might be more appropriately incorporated in section 4.3, since it really is also about the role of large particles.

Technical corrections: How many streams were employed with the Stamnes code? I always recommend to paper writers, including my own students, that a figure should be introduced first, before commenting on what it reveals. For example, in section 4.1 we read “In Figure 5 one can recognize  $\tilde{\epsilon}$ ”, before we have been told what figure 5 is about (i.e. just what data has been plotted). At the very bottom of page 7 we read “ $\text{im}(0.55) = 0.0063$ ”. What is meant here is, of course, the imaginary part of the refractive index, not the imaginary part of 0.55. A clearer notation is needed. The standard of English is very good. However, a few corrections are required: P 1 column 1: “dust acts cooling” is not correct. Further down “rather various” could be better expressed. P2 column 2: “can capsize to the positive” is rather clumsy. P7 column 1 first para: “micrometres” not “micrometers”. Section 4.2.1: “over the two surfaces” not “over the both surfaces”. Further down “acts heating” needs correcting. P13 column 2: “acts warming” is similarly incorrect.

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