

## ***Interactive comment on* “Recent progress in understanding physical and chemical properties of mineral dust” by P. Formenti et al.**

### **Anonymous Referee #1**

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Review of “Recent progress in understanding physical and chemical properties of mineral dust” by Formenti et al

This paper is a review paper which draws together previous literature pertaining to measurement of dust physic-chemical properties and the actual observed properties of N. African and Asian dust. As such it does not in itself represent new work, but it is a good critical presentation and consolidation of the recent studies. It is comprehensive in terms of aerosol measurement techniques and provides a good summary of recent observational campaigns. The paper also makes some recommendations for future research which follow logically from their review of existing data. I recommend it for publication subject to a few minor considerations which are detailed below.

My main request is that the authors consider whether it would be possible/useful to

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present some of the information in tables in a more graphical form preferably in the paper but also possible in supplementary material. For example, the parameters for log-normal modes established in recent campaigns are presented in a table – it would be easier to compare these if they were drawn up into a figure. Similarly I would like to see an example comparing the various definitions of diameter for a typical dust particle (aerodynamic, optical etc ). This would make the paper much more useful for non-experts in these measurement techniques. The information on mineralogy in section 3.1.1 is quite overwhelming – again would it be possible to devise a pictorial representation of this information. I recognise that the tables are needed for those who wish to use the values in other studies, but there would be considerable merit in both approaches.

The paper would also benefit from careful proof reading in terms of grammar and formatting, particularly of the citations in the text. There are some very short paragraphs in places (e.g. the introduction and section 2.3 which detract from the accessibility of the paper.

P 33189 line 22 “extents” to extends

P31191 For the uninitiated, what are “platy” particles?

P31193 line 27 – there seem to be some words missing from this sentence

P31197 is a reference to McConnell et al appropriate here in terms of discussion of impact of cut-off on optical properties?

P31201 line 23. It would perhaps be useful to say why much attention has been focussed on iron.

P 31211 line 9. I’m not sure that it is true that dust is transported above the marine boundary layer from western Africa during winter. I believe that flights during the DODO campaign found dust in the marine boundary layer on occasion. Certainly the statement is true for the summer season.

P31211. You refer to the lack of observations of internal mixtures of soot and dust. I believe that external mixtures are observed (e.g. in biomass burning regions such as the Sahel) and some references to these observations would be appropriate.

P31214. The authors should consider whether discussion of potential charging of dust particles is suitable for this publication.

P31219 line 15 “In particular, we recommend...(1)...”

P31219 line 23 “... should be sought”....

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 31187, 2010.

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