

Interactive comment on “Particle size traces modern Saharan dust transport and deposition across the equatorial North Atlantic” by Michèlle van der Does et al.

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Received and published: 2 May 2016

As a preface, this is not a peer review, just a short comment with some questions from an interested scientist, which would improve my understanding and hopefully the understanding of other readers.

I would like to begin this short comment by saying that my expertise is predominantly in remote sensing; we need optical models of aerosols to use in our retrieval algorithms, because the measurements made from space are insufficiently to unambiguously determine all relevant parameters of interest. So, reports of mineral dust size distributions are of interest to me. I also know that terminology between the in situ and remote-sensing communities may differ. In that regard, I had a few questions about the dust

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size distributions, which will help my understanding of these results in comparison with others:

1. The term "grain size" is used in multiple places. I was wondering how specifically the "size" is defined? Length of longest axis, diameter or radius of an equivalent spherical particle, something else? I did not spot that in the paper.
2. If I understand correctly, these grains were all recovered from moored traps within the sea itself at various depths. How closely are these expected to correspond to the size distribution of the dust in the atmosphere and falling on the surface? The paper (e.g. Figure 8) suggests that between the upper and lower sampling depth, there can be a difference of order a micron or so between modal sizes. Are the upper traps thought to be representative of dust in the atmosphere?
3. When calculating optical properties, due to the complex shapes of mineral dust grains, we typically model them as mixtures of ellipsoids of various sizes and with a distribution of different particle aspect ratios. The shape affects their scattering/absorption properties. I was wondering if you had any done any analyses of the particle shapes as well as the sizes?

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-344, 2016.