Atmospheric
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Discussions

EGU

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.**

Anonymous Referee #3

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General: The paper is well written, presents original, new material about dust optical and microphysical properties and is appropriate for ACP.

I have only minor remarks.

Details:

P3, L7-20: Please include references to old Prospero papers, i.e. Carlson and Prospero and Prospero and Carlson from the early 1970ies, when mentioning long-range transport across the Ocean.

P6, L11: Can we have some uncertainty values for all these measurements?

P6, L32-35: Was the field site upwind the run way (north of the runway)? Please provide some information concerning possible contamination of the surface observations by aircraft activity.

P8, Fig. 2: I always like to have date and time of the observations, and also height range of observation... in the plot or in the caption.

P9, Fig. 3: Again here, date, time, measurement height in the case of aircraft obs.

P10, L12: ... particles with diameters > 0.5 μm .. ...

P10, L25: please change to modern units, from mbar to hPa...

P11, Fig.4, please again: hPa instead of mba and mbar...

P15, L36: uplift...? , may be better: emission mechanism

P16 and following pages: Please keep in mind in the discussion that the PBL is an 'open' layer with particle sources in the free troposphere and further contiuoulsy contributing sources from the ground. So, it makes not really sense to me to illuminate the link between dust observations and back-trajectory-based age estimates in days.

P19, Fig. 11: mean values of all flights?

P19, L14-16. Fig 12: Why do you not use the classical fine and coarse mode separation? Fine mode particles with diameters < 1 μm, coarse mode, all particles > 1 μm. You separate at 0.5μm diameter.

P20, Fig. 12: The error bars then show the atmospheric variability (?) or just the uncertainty in the measurements? Please state, preferably in the caption.

P21, Fig 13: Again what do the error bars show?

And when comparing with other observations then please check also profile vs profile observations (e.g. extinction coefficient profiles measured with lidar during SAMUM 2, summer campaign, Praia, Cabo Verde, check Tellus Special Issue on SAMUM2).

P22, Fig.14, the correlation for SD is bad...., again the error bars: what do they show, and what can we conclude when error bars are so large?

P22, L7: Please check AERONET photometer values of r-eff, if available. Are they in good agreement with the aircraft observations?

P23: Discussion of findings, there are always new sources of particles in the PBL, as long as the air mass was over land....why do you then expect trends in D-eff as a function of age?

P23, Fig 16: When seeing Fig 16, I am missing size distribution plots showing fine and coarse dust distributions. What shape does the size distribution have? One mode or bimodal?

P24, Fig 17: Please do not over-interpret the weak or even not existing correlations. It is also confusing that we have sometimes results for D-eff classes from $0.1\text{-}1\mu$m, then $1\text{-}20\mu$m, and here now $0.1\text{-}2.5\mu$m.

Literature needs to be updated.

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