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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Out of Africa: High aerosol concentrations in the upper troposphere over Africa" *by* J. Heintzenberg et al.

Anonymous Referee #1

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- What are the reasons for such an obtrusive title? Does that paper need this kind of attention?

- Not until there is proof of "good scientific practice" - see below -, that paper needs serious face lifting.

DETAILS:

- page 2664, line 9: The instrumental setup onboard the commercial aircraft is poorly described and needs much more attention. That setup is crucial. The phrasing poses the impression, that Hermann (2000) has determined only the upper threshold in terms of aspiration efficiency and transmission. But, what about all the other problems? Making aerosol measurements on-board an aircraft is a major scientific undertaking. Most of the aerosol problems today arise from the (data) collection process and the instru-

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mental performance, especially under inflight conditions. It is good scientific practice in handling this point carefully. A few lines are not sufficient, and the reference to the own papers deal only with pressure dependence and upper threshold. But there is much more: How has the particle loss determined in the tubing's (bended inlets, hoses, etc.) connecting the sensing instruments to the outside air? Has the inlet system and the instrument being tested in a wind tunnel under low pressure and low temperature? Is there any effect of ram pressure? Is the inlet well outside the disturbed air of the aircraft hull? That distance could be different for gases (measured by other groups) and aerosol. How is the temperature at the instrument inlet? If that temperature has increased compared to outside air, how has this affected the particle size (water and aerosol compounds with low vapour pressure)? See discussion about clouds further down the paper.

- page 2664, line 20: Is the counting efficiency constant for all flight and ambient conditions?

- Fig. 1: Is it not the vertical projection you are showing? One day increments could be shown on the trajectories. What are the flight levels? That is not given in the tables or elsewhere (ten kilometres average is not enough). Where does the air come from in vertical terms (and thus sources)?

- Fig. 2: When colour coded, there is no need for confusion by shifting the concentrations vertically.

- page 2667, line 9: Have day and night flights been carried out at the same altitude?

- Fig. 3: What local time has been used? True local or "time zones" time?

- page 2670, line 8: This limited artefact discussion is sufficient for cloud questions, but not for the measurements in-flight in general.

- General remarks: I don't see any comparisons to other vertical soundings, like Deshler... There is only the discussion about transport from surface air, but there is much

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more: Ion induced particle production at upper tropospheric levels - Arnold et al; Sudden bursts and GPC - Berresheim, Kulmala, Salm, and Tammet.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 2661, 2003.