

## ***Interactive comment on “Transport of Saharan dust from the Bodélé Depression to the Amazon Basin: a case study” by Y. Ben-Ami et al.***

**Anonymous Referee #1**

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### Questionnaire

> Does the paper address relevant scientific questions within the scope of ACP? > Does the paper present novel concepts, ideas, tools, or data? > Are substantial conclusions reached?

The paper presents a case study of the links between wintertime dust emission in the Southern Sahara/Sahel, transport pattern over the ocean and dust deposition in South America. A variety of mostly remote sensing methods is used to follow the dust plume from its birth in the Bodélé region across the ocean, chemical measurements at the end of the chain indicate deposition of crustal elements into the rainforest.

> Are the scientific methods and assumptions valid and clearly outlined? > Are the

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results sufficient to support the interpretations and conclusions? > Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)?

The scientific methods used are sound and support the conclusions.

> Do the authors give proper credit to related work and clearly indicate their own new/original contribution? > Are the number and quality of references appropriate?

Appropriate references are given.

> Does the title clearly reflect the contents of the paper? > Does the abstract provide a concise and complete summary?

Title and abstract reflect the contents of the paper.

> Is the overall presentation well structured and clear? > Is the language fluent and precise? > Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?

The formal criteria are well met by the paper.

> Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?

See specific comments.

### Specific comments

4347/18-27: In this chapter, a little vaguely "minerals" are mentioned as "nutrients" (probably soluble ones, referring to 4347/15-17): can you specify which particular minerals can act as nutrients for rainforest? Aluminum and titanium are named, but it is hard to think of an aluminum shortage in the rainforest, or how the plants can make use of titanium, which is most probably oxidic in Saharan dust.

Fig. 3: Figure is hard to read, because the vertical profiles are mapped horizontally, e.

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g., it is quite difficult to follow the height evolution of the plume. If a 3D graph is really necessary, a suggestion would be to "flatten" the earth – distortions should be low due to closeness to the equator – and display only outlines of the continents. But as the scans are rather equidistant, the most readable way of this graph would be simply a set of 6 2D plots (latitude versus altitude), like to lower graphs. Also, the image quality is low - take care that the quality is higher in the final publication!

Fig. 4: The numbers given of the x axis are probably geographic coordinates? Please specify. If so, only a part of the track shown in the small image is displayed. Then, maybe it could be colored/marked, including the direction of flight.

Fig. 5: What is "pollution (P)"? Does this mean a variety of anthropogeneous aerosol? If so, does this aerosol show a consistent depolarization?

Fig. 6a: Explanation for the blue color should be added.

4355/9-10: Is the dust really mixed with BB smoke, or is this just a vertical superposition in different layers? It is hard to see from Fig. 3.

4355/17-18: Is the change from 0.19 to 0.22 significant?

Fig. 7a, caption line 2: omit ", and 50°W-10°E", as it is not averaged over this area

4356 and Fig. 8: As probably iron or maybe phosphorous or potassium play an important role for nutrient input, they should be displayed in that graph.

4357/1: "Chlorine"

4358/12-15: Can this conclusion really be drawn from the present case study?

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 4345, 2010.