

Interactive comment on “Optical, physical and chemical characteristics of Australian Desert dust aerosols: results from a field experiment” by M. Radhi et al.

Anonymous Referee #1

Received and published: 20 January 2010

General comments:

The paper investigates optical and chemical properties of aerosols in the Australian desert. The presented analysis of the aerosol optical depth and the Angstrom coefficient is based on more than two years of measurements with a sun photometer at Birdsville, a small outback town in south west Queensland. On the other hand, chemical characterisation of aerosol samples from Birdsville is limited to a total of four size-segregated samples collected in November 2006. The paper is well written and interesting to read, I therefore recommend the publication of this paper in ACP after consideration of the comment below:

Special comment:

My main concern is about the representativeness of the results of the chemical analyses based on a very small number ($n=4$) of aerosol samples collected within a few days in November 2006. The obtained results about sources and processes retrieved from the size-segregated aerosol samples are certainly informative and valuable. However, the results are discussed in a way that readers might think they are representative for the Australian desert aerosol during all seasons (e.g. Page 25096 L 14/15 “This ratio of Fe to Si may be used to build a signature for Australian soil”; or Page 25096 L 20/21 “Both of these ratios can be incorporated in our soil signature”; or Page 25102 L3 “We have found that Australian desert dust is well mixed . . .”). This is not the case. In the strict sense, the presented findings are only valid for the aerosol samples analysed as the variability of the chemical composition and element ratios remain unknown. The authors should clearly discuss the limitations of the presented study and should present the chemical composition data as belonging to a case study giving some valuable indications about sources and processes affecting the Australian desert aerosol.

Minor comments:

Page 25086, L20/21: Should be changed to “. . .and Co reasonably correlated with Si, . . .”.

Page 25088, L23: Typo, should note “. . .NASA’s global . . .”.

Page 25090, L16: What is meant by “true” diameter? I suppose you mean something like the “geometric di-iameter of an equivalent sphere”. The word “true” should be avoided here.

Page 25094, L2: Typo, Should note “. . . coarse . . .”.

Page 25095, L11-13: The reference of a study questioning the AERONET retrievals should be given here.

Page 25095, L16: The phrase “excellent” seems to me not appropriate for compari-

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son of the two size distributions, I suggest changing to something like “reasonable” or “good”.

Page 25098, L5: I don’t understand what is meant by “No trend line is presented in the plots against Si.”. In Figure 9c are regression lines for Na vs. Si and for Cl vs. Si included. Is it meant that there is no correlation between Na and Si, and Cl and Si, respectively? Please correct accordingly.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 25085, 2009.

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