

Interactive comment on “The role of iron and black carbon in aerosol light absorption” by Y. Derimian et al.

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General comments:

It's impressive that this paper is in very good form prior to going through the review process. The science is interesting and convincing. The paper is well written and easy to follow.

The authors have taken pains to point out the assumptions required by their method, and point out possible problems with their methodology. For example, in section 4.2, second paragraph, the authors mention the possible pitfall of determining (equivalent) BC concentration using optical means when other species (light absorbing Fe) might interfere with this determination.

The results shown in Table 1 indicate that their method may provide information about the Fe content of the aerosols.

Specific comments:

I have a few suggestions to improve this paper:

(1) The comparison of Fe concentration derived from their empirical measurements with actual measurements of Fe shown in Table 1 agree fairly well. However, with so few data cases available, it's not assured that the method would work well consistently. It might be a good idea to mention in the conclusions section that more comparisons with data would be useful to assess the method's validity. (To be fair, at the bottom of page 8175, the authors do make a statement that more observations should lead to an improvement in their empirical relationship).

(2) The authors might wish to mention some prior art that might be relevant. In particular, the authors might want to look at these papers:

Alfaro et al, 2004: Iron oxides and light absorption by pure desert dust: An experimental study, *J. Geophys. Res.*, 109, D08208, doi:10.1029/2003JD004347.

The above paper derives an empirical equation for single-scattering albedo (SSA); Eqn 17 in the paper. The equation predicts SSA as a function of BC and Fe concentrations. This work should be mentioned.

Below are some additional papers that might be worth a look:

Clarke, A. D. et al., 2004: Size distributions and mixtures of dust and black carbon aerosol in Asian outflow: Physiochemistry and optical properties., *J. Geophys. Res.*, 109, D15S09, doi:10.1029/2003JD004378.

Linke, C., et al., 2006: Optical properties and mineralogical composition of different Saharan mineral dust samples: a laboratory study, *Atmos. Chem. Phys.*, 6, 3315-3323.

Technical corrections:

I didn't find any typos, etc.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 8159, 2007.

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