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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Estimation of mineral dust longwave radiative forcing: sensitivity study to particle properties and application to real cases over Barcelona" *by* M. Sicard et al.

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Answer to EC C1390

I suggest some specifications and additional comments in the manuscript: Section 2.2 and Fig. 3: Isn't it assumed that mineral dust aerosol size distributions are made of lognormal modes? If this is the case you might specify it and also that sigma is then a "geometric" standard deviation.

REPLY: Yes, the mineral dust aerosol size distributions are assumed to be lognormal.

It is explicitly said in the Appendix (p. 8553, l. 9). It has been added to the revised manuscript at the beginning of Section 2.2. We call σV the standard deviation associated to the volume median radius. In the Appendix (p. 8553, ec. 3) it is explicitly said that σV is equivalent to the geometric standard deviation, σg.

Section 4, p.8546 and Fig. 7d: you probably assume that the (geometric ?) standard deviation of the size distribution is kept contant and might specify it.

REPLY: Yes, the standard deviation is maintained constant. It has been specified in the revised manuscript.

Section 5, top of p.8548: the cases summarized in this table would deserve some comments when the Table 3 is cited.

REPLY: The table has been commented in the revised manuscript.

Section 5, middle of p. 8550: you might comment why those particular cases result in such a low forcing.

REPLY: Some comments have been added in the revised manuscript. The main reason is the reduced incoming solar radiation due to large solar zenith angles.

End of section Section 5: you might comment why those two cases are specific.

REPLY: Cases 7 and 11 are not specific by themselves. They have been selected as they produce the highest and lowest radiative forcing (in absolute value) at the BOA, respectively, in order to somehow represent an envelope in which the profiles of the heating/cooling rates of all cases vary.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 8533, 2014.