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Atmospheric Chemistry and Physics Discussions

Interactive comment on "LACIS-measurements and parameterization of sea-salt particle hygroscopic growth and activation" *by* D. Niedermeier et al.

D. Niedermeier et al.

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We thank Mr. G. Biskos for his comments. In the following our responses are given:

1. "...Although greater deviations are predicted for sub-100 nm particles, the size-dependent shape factor of 150- and 200-nm NaCl particles (that the authors investigate) can still be significantly higher than 1.08 (cf. inset of Fig.1b in Biskos et al., 2006a)."

The measured hygroscopic growth of the NaCl particles with Dme = 139 nm and Dme = 185 nm (including χ = 1.08) was simulated with Köhler theory using the Pitzer model (Pitzer and Mayorga, 1973). The result was that the measurements and the calculations fit perfectly; therefore no larger shape factor had to be used. The theoretical

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hygroscopic growth curve for the NaCl particles with Dme = 139 nm and Dme = 185 nm is shown in Fig. 3.

2. "Following on the comment of Reviewer 2 for the shape factor of (NH4)2SO4 particles, the consensus from the literature that they are spherical may not be fully true. In fact, recent experimental evidence suggests that ammonium sulfate particles are slightly non-spherical, having an associated shape factor that ranges from 1.07 to 1.03 as particle size decreases from 500 to 160 nm (Zelenyuk et al., 2006)."

Following the reviewer's suggestion, ELPI measurements were repeated for ammonium sulfate particles and a shape factor of about 1.04 was found (as stated in literature (Zelenyuk et al., 2006)). Therefore the whole data analysis was redone. The result was that changes in RH due to the shape factor correction are small. For high RHs, the uncertainty in LACIS amounts to +/- 0.3% in RH absolute. The influence of a shape factor of 1.04 vanishes within these uncertainties. Changes due to the shape factor correction of ammonium sulfate particles were performed in Sections 5, 6 and 7 and in Appendices A and B.

References

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