

Supplement of Geosci. Model Dev. Discuss., 7, 3367–3402, 2014
<http://www.geosci-model-dev-discuss.net/gmdd-7-3367-2014/>
doi:10.5194/gmdd-7-3367-2014-supplement
© Author(s) 2014. CC Attribution 3.0 License.



Supplement of

Sensitivity of aerosol extinction to new mixing rules in the AEROPT submodel of the ECHAM5/MESSy1.9 atmospheric chemistry (EMAC) model

K. Klingmüller et al.

Correspondence to: K. Klingmüller (klingmueller@cyi.ac.cy)

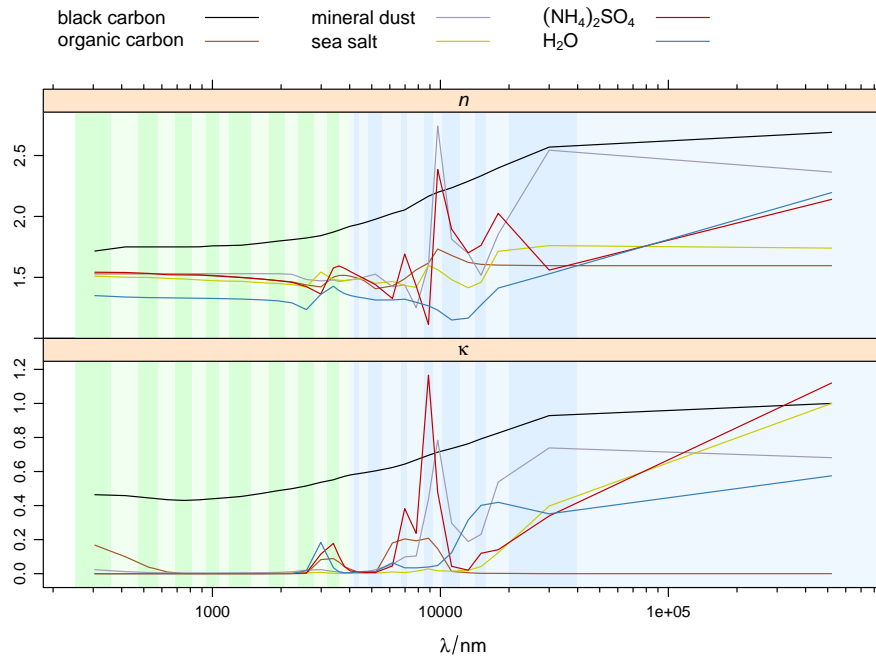


Figure S1: Real part n and imaginary part κ of refractive indices of various components used by the column model in section 4.1. The data for ammonium sulphate $(\text{NH}_4)_2\text{SO}_4$ also serves as default for other components. The background shading represents the shortwave (green, including the AEROPT sub-bands) and longwave (blue) bands used in EMAC.

Refractive indices

Figure S1 shows refractive indices collected from the OPAC 3.1 database (Hess et al., 1998) (black carbon, mineral dust) and the HITRAN 2004 database (Rothman et al., 2005) (organic carbon, sea salt, ammonium sulphate, water). The mineral dust and organic carbon values have been complemented by data from I. N. Sokolik (unpublished data, 2005) and Kirchstetter et al. (2004), respectively.

References

Hess, M., Koepke, P., and Schult, I.: Optical Properties of Aerosols and Clouds: The Software Package OPAC., *Bulletin of the American Meteorological Society*, 79, 831–844, doi:10.1175/1520-0477(1998)079<0831:OPOAAC>2.0.CO;2, URL <http://adsabs.harvard.edu/abs/1998BAMS...79..831H>, 1998.

Kirchstetter, T. W., Novakov, T., and Hobbs, P. V.: Evidence that the spectral dependence of light absorption by aerosols is affected by organic carbon, *Jour-*

nal of Geophysical Research: Atmospheres, 109, doi:10.1029/2004JD004999, URL <http://adsabs.harvard.edu/abs/2004JGRD...10921208K>, 2004.

Rothman, L. S., Jacquemart, D., Barbe, A., Chris Benner, D., Birk, M., Brown, L. R., Carleer, M. R., Chackerian, C., Chance, K., Coudert, L. H., Dana, V., Devi, V. M., Flaud, J.-M., Gamache, R. R., Goldman, A., Hartmann, J.-M., Jucks, K. W., Maki, A. G., Mandin, J.-Y., Massie, S. T., Orphal, J., Perrin, A., Rinsland, C. P., Smith, M. A. H., Tennyson, J., Tolchenov, R. N., Toth, R. A., Vander Auwera, J., Varanasi, P., and Wagner, G.: The HITRAN 2004 molecular spectroscopic database, *Journal of Quantitative Spectroscopy and Radiative Transfer*, 96, 139, doi:10.1016/j.jqsrt.2004.10.008, URL <http://adsabs.harvard.edu/abs/2005JQSRT...96...139R>, 2005.