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Interactive comment on “Modelling light scattering by mineral dust using spheroids: assessment of applicability” by S. Merikallio et al.

S. Merikallio et al.

sini.merikallio@fmi.fi

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Anonymous Referee #2: “This paper investigates whether a distribution of spheroids can be used to model the light scattering behavior of atmospheric mineral dust in the visible spectrum. This is done by examining the scattering-matrix elements’ angular behavior and comparing them to relevant laboratory-based measurements. In my opinion, the work appears to be well done and is presented in the paper effectively. As the authors acknowledge, the success of mimicking the scattering behavior of dust particles by simple spheroids is rather poor. I am not too surprised that a particle as complicated in structure as dust would not be well-modeled in this way. Spheroids can only represent the “overall” length scales of the dust particles, whereas the finer structural details are important (perhaps critical) given they are of the order of the wavelength in size.

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Nevertheless, there do seem to be some interesting parallels between spheroids and complex-shaped particles. The authors do a fine job illustrating such similarities, e.g., the three power-law shape distribution. Given the results, I would encourage future researchers to use more realistic particle shapes, especially in climate models where such "inputs" can have substantial influence on the radiative forcing."

Answer: Encouragement of Referee 2 to move towards more realistic shapes is well received and we are currently working with slightly more complex model particles, namely ellipsoids. We do hope that the present investigation will help people to use spheroids in the best possible way, should they choose to use them for modelling scattering by dust particles.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 3977, 2011.

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