

Single scattering albedo of homogeneous, spherical particles in the transition region

Hans Moosmüller^{a,*} and Christopher M. Sorensen^b

^aLaboratory for Aerosol Science, Spectroscopy, and Optics, Desert Research Institute, 2215 Raggio Parkway, Reno, NV 89512, USA

^bDepartment of Physics, Kansas State University, 325A Cardwell Hall, Manhattan, KS 66506, USA

*Presenting author (hansm@dri.edu)

The aerosol single scattering albedo (SSA) is the dominant intensive particle parameter determining the aerosols radiative forcing in the earth's atmosphere [1–3]. We use Mie theory to examine the behavior of SSA as a function of size parameter x and complex refractive index m for homogeneous spherical particles. Previously, we investigated the limiting cases of the small particle limit ($x \ll 1$) and the large particle limit ($x \gg 1$), where SSA is proportional to x^3 and independent of the size parameter x , respectively [4]. In between these cases lies the transition (or peak) region, where SSA transitions from the small to the large particle regime and, for sufficiently small imaginary parts of the refractive index, shows one or more peaks.

Here, we investigate the behavior of SSA in the transition region including conditions on the complex refractive index for peak formation, peak location, and general properties of SSA as function of size parameter.

References

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