

Interactive comment on “Dependence of the single-scattering properties of small ice crystals on idealized shape models” by J. Um and G. M. McFarquhar

Anonymous Referee #1

Received and published: 2 December 2010

General comments: A new geometry, namely, the budding Bucky ball, was introduced to approximate the shape of small ice crystals. It is shown (Fig. 3) that the image of a budding Bucky ball can be quasi-circular if a low resolution is used for the image. Thus, the definition of this geometry is not without observational basis. Because the optical properties of small ice crystals are critical to remote sensing and radiative transfer simulation involving ice clouds, this manuscript addresses an important subject and can be a useful contribution. Overall, the manuscript is well written. No major technical errors were found. However, some improvements are suggested for the authors' consideration.

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Specific comments:

- 1). In this paper, only the phase function and the asymmetry factor are computed. For many applications, the extinction cross section and single-scattering albedo are needed. It is suggested that some calculations be done for the extinction cross section and single-scattering albedo at some near-infrared and thermal infrared wavelengths whereas absorption is involved.
- 2). Some comments on the applicability of the ray-tracing technique should be included, particularly, in the case where this technique is applied to small ice crystals.
- 3). The first line in the abstract: it is suggested to change “Small ice crystals . . . appear quasi-circular” to “The projections of small ice crystals . . . appear quasi-circular”.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 28109, 2010.

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