

Interactive comment on “Application of a diode array spectroradiometer to measuring the spectral scattering properties of cloud types in a laboratory” by A. R. D. Smedley et al.

Anonymous Referee #2

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Review of “Application of a diode array spectroradiometer to measuring the spectral scattering properties of cloud types in a laboratory” by A. R. D. Smedley, A. R. Webb, and C. P. R. Saunders

This is a very nice and carefully written paper devoted to an important problem of cloud particle characterization using spectrally and angularly resolved measurements of scattering. The paper should definitely be published after the two concerns described below have been addressed.

I. The authors assume the validity of the single-scattering approximation (SSA). The criteria of validity of the SSA have recently been revisited based on first principles of

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electromagnetic scattering [1, 2]. In particular, it is argued in [2] that the assumption of small optical thickness may be insufficient. I am rather positive that the actual measurement conditions described in the manuscript were consistent with the criteria of validity of the SSA. However, it would be prudent and instructive to verify and confirm this consistency since this would increase the reliability of the laboratory data and the robustness of the experimental approach.

II. One fundamental (albeit seldom discussed) aspect of light scattering not reproduced by the SSA at all is the forward-scattering interference phenomenon [3, 4]. By its very nature, this phenomenon may have affected the results of measurements at small scattering angle, potentially explaining (at least partially) why the measurements at the smallest scattering angle are so much greater than the theoretical SSA results. The authors should definitely comment on this aspect.

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