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Atmospheric Measurement Techniques Discussions

Interactive comment on "Extinction and Optical Depth Retrievals for CALIPSO's Version 4 Data Release" *by* Stuart A. Young et al.

Anonymous Referee #3

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I can only echo the findings of the other two reviewers. This paper is well organized and well written and certainly of interest to the broad cloud/radiation/remote sensing communities.

I do have one additional point to make though. It concerns the constrained retrieval in ice clouds. I am familiar with a the following paper: "Reverdy, et al. (2015), An EarthCARE/ATLID simulator to evaluate cloud description in climate models, J. Geophys. Res. Atmos., 120, 11,090–11,113, doi:10.1002/2015JD023919". If one looks in the appendix of this paper, there are some observations and lidar Monte-Carlo calculations that suggest that for small particle semi-transparent cirrus that the Rayleigh return below cloud may suffer from (small but sometimes not-insignificant) multiple-scattering induced decaying tails.

Remembering the Reverdy paper made me realise that I was not able to find any discussion of how the below cloud return altitude range for the constrained retrieval procedure in this submission. Accordingly, I think the addition of a few lines somewhere describing this and the possible (but likely limited) effect of multiple-scattering tails would not be out of place in this paper.

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