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Interactive comment on "Simulations of spaceborne multiwavelength lidar measurements and retrievals of aerosol microphysics" *by* David N. Whiteman et al.

Anonymous Referee #1

Received and published: 25 July 2016

An interesting paper. I have a only mainly editorial concerns.

Line 13: What is meant by "reduced optical data"? It is likely not clear to the general reader and thus, a sentence explaining this should be inserted in the abstract. It is also unclear what is meant by "yield". I guess the authors are referring to the fraction of data volume that yields a final inversion product subject to some accuracy requirement.

Simulation approach: The part of the simulation chain going from the simulated HSRL measurements to the retrieved extinction and backscatter profiles seems, to me, to be missing. Perhaps, this aspect is well-covered by one or more of the references. However, even if this is the case, it needs to be explicitly called out and even a quick overview would improve the presentation.

Line 135: In the LE inversions were formulations using both volume and area based kernels used? Some studies have suggested that this can improve the accuracy of the volume and area retrievals respectively. Also were the full number of principle components, in general, used to generate the linear estimators?

Line 141: Why remove the uv and not the green? An, arbitrary decision or something else?

Line 158: Change "profile" to "profiles"

Line 188: What is the uv extinction the noisiest? Rayleigh backscatter and extinction is about 5 times higher in the uv and the green so I guess that the total (Rayleigh+aerosol) extinction can be more accurately determined than in the green. However, the contrast between the Raleigh and aerosol extinction is much greater at 532 nm and this leads to the final SNR being higher in the green than in the uv. Is this correct?

Figure 1: Why is the first data point at 600-700 meters? Is this a Topography effect or a retrieval issue?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-174, 2016.

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Discussion paper