Atmospheric
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Discussions

Interactive comment on "Information Content and Sensitivity of the $3\beta + 2\alpha$ Lidar Measurement System for Aerosol Microphysical Retrievals" *by* Sharon P. Burton et al.

Anonymous Referee #2

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The manuscript of S. Burton et al. presents an interesting study about the information content of 3+2 lidar measurements in respect to aerosol microscopical properties. The topic is interesting and relevant to the lidar community. Apart from the comments of the first reviewer, my main concern is that the authors ignore an important previously published work with similar topic (and title):

Veselovskii, I., Kolgotin, A., Müller, D. and Whiteman, D. N.: Information content of multiwavelength lidar data with respect to microphysical particle properties derived from eigenvalue analysis, Appl. Opt., 44(25), 5292–5303, doi:10.1364/AO.44.005292, 2005.

The authors should discuss their methodology and results taking into acount this work

(what are the benefits of Optimal Estimator method in respect to eigenvalue analysis? Are the results of the two methods similar and how do they explain possible differences?)

Technical comments:

Page2, line 32: "between 30nm and 8um". Specify that these are only typical values. E.g. other authors have uses different bound for their search space (0.05 – 25um):

Veselovskii, I., Dubovik, O., Kolgotin, A., Lapyonok, T., Di Girolamo, P., Summa, D., Whiteman, D. N., Mishchenko, M. and Tanré, D.: Application of randomly oriented spheroids for retrieval of dust particle parameters from multiwavelength lidar measurements, J. Geophys. Res., 115(D21), D21203, doi:10.1029/2010JD014139, 2010.

Page 3, line 23: Give references that describe these approached.