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Atmospheric Measurement Techniques Discussions

Interactive comment on "The potential of elastic/polarization lidars to retrieve extinction profiles" *by* Elina Giannakaki et al.

Anonymous Referee #3

Received and published: 19 November 2019

The paper presents a methodology for the estimation of aerosol extinction profiles form single wavelength elastic lidars with a depolarization channel. It is presented the general concept and its applicability is examined. The paper is appropriate for AMT and the methodology is very useful for daytime measurements of simple lidar systems. The paper should be accepted for publication after considering my comments below.

Abstract. To my understanding the focus of the paper is to present the Elastic Extinction Retrieval (EER) methodology, using data at Finokalia as a case study. Therefore the abstract should be rephrased accordingly.

Line 25. Please quantify what is reasonable difference.

Line 33. Please replace "The types of aerosols" with "Pure aerosol types"

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Discussion paper

Line 35 Replace “is occurred” with “occur” and in the references use e.g.

Line 37. Add “the” before the European.

Line 38. Please provide a reference for your claim that there is no mixing between maritime and desert dust.

Lines 52 to 64. The authors should mention here that many of the references correspond to the POLIPHON algorithm. In addition they should outline here that in this paper they aim to present a general concept algorithm approach rather than presenting cases studies as they did in their 2017 papers.

Section 2. To my understanding the main focus of this section should be 2.4 which should be rephrased as “Description of the EER method. This section should be written in a general way and not dependent on the certain lidar system. I would suggest to expand this section, and move earlier as 2.1. In addition they authors should provide the equations they use so that the reader can reproduce their methodology. In addition I would suggest that they should not limit the description of the methodology to mixtures of marine and dust but in general for mixtures of aerosols with distinct intensive parameters. They should also examine how sensitive is their algorithm to the a priori lidar ratio values considered. Of course then they can continue with the Finokalia case study as demonstration case study.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-271, 2019.

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