Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2017-131-RC2, 2017

Atmospheric Measurement Techniques Discussions

Interactive comment on "Potential of polarization/Raman lidar to separate fine dust, coarse dust, maritime, and anthropogenic aerosol profiles" *by* Rodanthi-Elisavet Mamouri and Albert Ansmann

Anonymous Referee #2

Received and published: 1 June 2017

The manuscript by Mamouri and Ansmann describes an extension of the POLIPHON algorithm separating the contribution of fine-dust and coarse-dust aerosol particles and their mass concentration in the well-defined Saharan Air Layer as well as in the mixed boundary layer. The paper is well written, clearly structures and the method as well as the examples are described in a comprehensive and comprehensible way. Therefore I recommend publication after addressing only some minor comments.

General comments:

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Discussion paper

How is the derived conversion factor from AERONET affected by boundary layer aerosols?

The conversion factors of the continental aerosol over Cyprus and Germany show some differences. What may be the reason for these differences? Are you looking at different 'mixtures' at the different locations?

Specific comments:

P5, l11: How do you derive the BFMF of 0.06? Can you give some more details to that?

P5, l19ff: Can you clearly identify the article you refer to for the particle linear depolarization ratios at 532 and 1064 nm.

P8, l31 / P9, l1: Can you give a reference for the contribution of marine aerosols and fine dust? Are there any in-situ measurements available?

P10, l4: There is a typo concerning the references.

P 14, l21: As the boundary layer in this case is not only Saharan dust, I think you mean 4 km deep aerosol layer or 3 km deep dust layer?

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