

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2022-306

Anonymous Referee #2

Referee comment on "DeLiAn – a growing collection of depolarization ratio, lidar ratio and Ångström exponent for different aerosol types and mixtures from ground-based lidar observations" by Athena Augusta Floutsi et al., Atmos. Meas. Tech. Discuss.,
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Review of the paper by Floutsi et al.

The authors in their paper present a valuable collection of intensive properties of the aerosols, retrieved from ground-based lidar observations, which are associated to different aerosol types and mixtures. The paper provides a very comprehensive overview of the various campaigns and relevant publications, where these properties are presented and discussed. The paper is well written and structured and should be accepted for publication in AMT after considering some comments raised below.

Although such information might be available in the publications referenced, the authors should provide a comment, how they define from the measurement conditions an aerosol type as pure. Do they consider only the location of the site or they use also other tools such as trajectories or models?

Do the authors consider the ageing of the observed aerosols as a parameter for the typing (this was found in previous studies to be crucial especially for smoke)? A relevant comment should be added in the discussion.

It is confusing, as written, how the authors distinguish "pollution" type and "central European background". More or less for both categories they use measurements from the same stations. They should provide a comment, why in certain cases they consider an observation as representative for pollution and why as background.

The authors group separately mixtures of different aerosol types, especially dust with smoke, dust with pollution and dust with marine. They should provide more details how they define an aerosol scene as a mixture. To my understanding they average all relevant scenes in order to provide a representative value for a certain mixture. Does the mixing ratio of the pure types involved play a role in the typing and do the authors claim that this ratio is not significantly different from location to location?