

Interactive comment on “Transport of aerosols over the French Riviera – Link between ground-based lidar and spaceborne observations” by Patrick Chazette et al.

Anonymous Referee #1

Received and published: 31 December 2018

General Comments This paper describes an observation of aerosols in French Riviera using a single-wavelength Raman lidar at 355 nm which also has a depolarization ratio measurement capability. Analysis of optical characteristics and vertical profiles of aerosols, which is possible with a single-wavelength Raman lidar, is done. Transport of aerosols is discussed with satellite data and trajectory analysis. The manuscript is generally well written. The back scatter to extinction ratio (BER) instead of the lidar ratio is used in this paper. However, nothing is simplified by using BER, even if “it is equal to the product of the single scattering albedo and of the probability of a photon being backscattered ...” It is fine to use BER, as far as both BER and lidar ratio values are indicated. However, in my opinion, it is not recommended, generally, to use BER

C1

instead of the lidar ratio. The historical background should be respected.

Specific Comments Abstract: Wavelength of the lidar must be described before the descriptions on the BER values. Figs. 2 and 3: What are the areas indicated as “local”? Is the contribution of advection in the boundary layer not significant? From our experience, aerosols in the boundary layer can be transported quite long distance in the lower atmosphere. Though it would not be a scope of this paper, an analysis using chemical transport model would be useful to understand the emission sources and transport. The reason for insensitivity of BER to relative humidity should be discussed further, if other parameters related to particle size and refractive index are available from AERONET data. Is there any change in the depolarization ratio with relative humidity?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-971>, 2018.

C2