Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2016-97-RC1, 2016

Atmospheric Measurement Techniques Discussions

Interactive comment on "Comparison of the aerosol optical properties and size distribution retrieved by Sun photometer with in-situ measurements at mid-latitude" *by* Aurélien Chauvigné et al.

Anonymous Referee #2

Received and published: 3 June 2016

A set of papers presents analysis of correlation between parameters of aerosol particles received from in-situ measurements at the ground-based sites or at meteorological towers and the results of columnar or altitude- resolved remote sensing data. Nevertheless, this multiple-factor problem remains relevant for interpreting data of complex atmospheric experiments. The manuscript by Chauvigné et al presents novel results for characterization of this problem because of uniqueness of the database gathered at the PUY atmospheric station. The authors analyze the results of long-term in-situ meteorological, aerosol optical and microphysical observations at two sites with altitude 0.4 and 1.4 km, as well as data of lidar and sun-radiometer measurements. Depend-

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ing on meteorological conditions, the upper site of in-situ measurements was located either within mixing layer, or in free troposphere which allows the different variants of aerosol investigations to be considered. Paper can be recommended for publication.

List of specific comments:

Page 8, Line 18, 19: Remove “Error! Reference source not found” and correct the text. Page 8, Line 26: It is appropriate to note that results of in-situ measurements in the ground-based layer are affected by local aerosol sources. Measurement conditions at the high altitude Puy de Dôme site eliminate such interferences.

Figure 7 and 8: what means Diameter? (mode, median ....of fine/coarse particle volume distribution ?)

Part 5.2 The significant difference between “in-situ and Sun-photometer diameters” of fine particles is a very interesting result. Do authors have a physical interpretation of this feature?

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