

Interactive comment on “Aerosol characterization in Northern Africa, Northeastern Atlantic, Mediterranean Basin and Middle East from direct-sun AERONET observations” by S. Basart et al.

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Dear Referee,

Thank you for your comments.

As the reviewer states, to fully characterized an aerosol load one need to know the aerosol size distribution and the refractive index. However this is only feasible in very few aerosol stations with full and high-quality measurement programs. Theoretically these properties could be also derived from inversions performed to Cimel's sky radi-

C934

ance measurements. Almuqantar and principal plane measurements are not routinely performed in all stations and they require absolute sky calibrations that we know are much more difficult and little than direct sun calibrations (based on transference of Langley calibrations). Even in those Cimel stations with accurate sky calibrations the interpretation of single scattering albedo and refractive index is subject to many uncertainties. As shown in recent works (e.g. Prats et al., 2009), the current inversion algorithms are still under development and they have present some technical problems. Since the goal of this paper is to obtain a dust characterization over a huge region with standardized and robust measurements, so we have decide to take advantage of numerous measurements of the spectral optical thickness which can supplement aerosol properties derived from less frequent multi-angle sky radiance inversions. For these reasons, direct-sun observations were selected for the present work. In the near future this information will be used in combination with other data such as lidar and in-situ PM measurements with the main goal of providing more insight on the vertical and horizontal transport of the aerosol over this region, and to contribute to a better exploitation of present and future aerosol products from satellite and modeling data. However, these new studies will be constraint to Europe because the scarcity of lidar and PM measurements in northern Africa.

We have included several references suggested by the reviewer that describe some of the results described in the paper.

References:

Prats, N., Cachorro, V. E., Sorribas, M., Toledano, C., Berjón, A., Rodrigo, R., Torres, B. and de Frutos, A. M. (2009) “Analysis of AERONET Inversion Algorithm's Products at “El Arenosillo” Station, Southwest Spain”. AIP Conf. Proc. March 11, 2009, Volume 1100, pp. 193-196, doi:10.1063/1.3116947.

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C935