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Atmospheric Chemistry and Physics Discussions

ACPD
9, C2013–C2016, 2009

Interactive Comment

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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Reply to the comments with MS-NR: acpd-9-C1788-2009

Dear Referee,

Thank you for your comments. Please find hereafter our answers to the points you raised.

Point 1. The present analysis shows the main results of an aerosol characterization with emphasis on the coarse mode contribution related to mineral dust in the Northern

Africa, Northeastern Atlantic, Mediterranean Basin and Middle East. A general account of each site describing coarse/fine proportions and the aerosol extinction associated to each cluster during the seasons and possible origins/causes is the first product of the present analysis. Naming the study as a "size characterization" would be slightly reductive. In the near future this information will be used to contribute to a better exploitation of present and future aerosol products from satellite and modeling data.

Point 2. Since the emphasis of the study is on coarse-mode mineral particles, the bias introduced by the AOD>0.15 filter is not expected to be so important. In fact, AODs associated to dust conditions are usually higher. If we analyze the quartiles of each station, we can observe that percentile 25 of AOD is found <0.15 in stations located in the Iberian Peninsula and around the Mediterranean Basin, as well as, some particular sites, as Izana station where the presence of coarse-mode mineral dust is sporadic. However, it is true that in the manuscript, it could be necessary to emphasize the seasonal evolution of the available data and the proportion of measurements with AOD<0.15. We could include a table with the seasonal distribution of the data and the percentage of AOD<0.15.

Point 3. As the reviewer states, Le Fauga and Ispra have more than 12 months of the Level 2.0. These stations were discarded due to their location. On one hand, Ispra site is found at higher latitudes ($\sim$46°N) in a mountain-surrounded valley where almost no sign of dust impact on its record is observed. On the other hand, due to its location in the northern side of the Pyrenees, Le Fauga station present a high percentage of cloud-screened ($\sim$60%) in comparison with the values of other stations in the same latitudes (as AVI, CAR, TUL, VIL or BAR) which are <40%. With respect the graphics, we will change the size marks and we could include additional tables.

Point 6. The AdA space definition is given at line 2 of page 7713. The acronym is then used ten more times. We believe it is better to keep this definition for the sake of brevity.

Point 10. We will improve a color scale. In the Fig.1, the values of the seasonal frequency (f) of large aerosols (with AOD>0.15 and α<0.75) at AGO, BAN, CIN, DJO, ILO and OUA sites are shown. In the Fig.1, you can see that DJO and ILO have lower proportions than AGO, BAN, CIN or OUA in autumn. Furthermore, AGO, BAN, CIN and OUA sites present high values over the year.

Point 14. Related to the use of instantaneous measurements, we select this type of observations in order to show the particular properties of the different aerosol types present in each site avoiding the "homogeneity" of the optical properties values and the size distribution that the daily or hourly average can introduce. In the text, we have tried to describe the main features and frequency of occurrence of each cluster detected in each AERONET site. Only the highest extinctions of each site can be due to a single episode and this has been taken into account in the values included in the manuscript.

Point 16. We will move this discussion to the results section.

We will include comments/changes on the contents and presentation of the manuscript as suggested in the points 4, 5, 7, 8, 9, 11, 12, 13 and 15.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 7707, 2009.

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f(%)				
Site	Winter	Spring	Summer	Autumn
AGO	96,87	99,98	99,15	98,95
BAN	85,65	99,71	97,21	95,99
CIN	83,27	98,49	97,94	96,06
DJO	60,50	98,73	75,45	65,78
ILO	54,63	97,80	68,18	56,17
OUA	88,57	98,47	92,89	92,17

Fig. 1.

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Interactive Discussion

Discussion Paper