

Interactive comment on “Morphological, chemical and optical absorbing characterization of aerosols in the urban atmosphere of Valladolid” by S. Mogo et al.

S. Mogo et al.

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We wish to thank the referee for his interest in our work and his constructive comments on the manuscript. The follow is a point by point response in which we intend to show how we had addressed each item mentioned in the review.

General comments:

It is true that only 17 measurements are a very small data set but they are not so dispersed as they look at first glance. The first measurement took place on Dec 03 and the last one took place on Jun 03 but we must point that 12 of the measurements

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were concentrated between Jan 19 and Apr 20 which makes about one measurement a week during three months. Anyway we agree that this is still a small data set. Nevertheless, it could give us a qualitative-semiquantitative idea about the aerosols of the city of Valladolid. This town is representative of the middle center of Spain where there are not studies about aerosol properties. In the revised manuscript we performed a much deeper analysis of the data. We also added some references to compare, our data with other European towns. As suggested, more references to other SEM studies were also added.

Technical comments:

Page 3927, line 17 - The instrument has an uncertainty of calibration of $\approx 20\%$. This is clarified now in the manuscript.

Page 3928-3929 - In the figure caption we added the information that 60 particles were analyzed in each range of sizes.

The follow sentence had been added to the manuscript: "... in the vacuum of the microscope volatile compounds are lost and under the electron beam some particles may change their shape even when a very low-intensity beam is used. Because of this, Fig. 7 refers only to non-volatile components of particulate matter. Another limitation of the SEM is that the method is very laborious and time consuming; nevertheless, it is a powerful tool for detailed characterization of individual aerosol particles."

Page 3931, line 1-4 - When we say that the atmosphere of Valladolid (or any other town from central Spain) is not comparable to other European towns we are referring the high PM concentration values registered in central Spain due to the aridity of the lands surrounding the towns and to the agricultural influence. The extremely rough bare and dry soils make the background measurements very high comparatively to the other European towns. Furthermore, the frequent arrival of desert dust outbreaks over Spain was studied in recent works (Rodrigues et al. 2001, Vergaz et al., Querol et al. 2004, Perez et al. 2005). The local soils and the desert dust outbreaks contribute

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to the high concentrations of PM, which are very high considering the daily limits and annual averages proposed by the EU directive for PM10. This had been explained in the revised manuscript. We have added some references to show this higher PM concentration levels in Valladolid.

Page 3931, line25-29 - We are just explaining the value of σ_a for 400 nm on Feb 11. This value is lower than that of 450 nm. This is not normal if we consider the theory and this value reflects the large uncertainty and error at this wavelength. This value may not be physically consistent but it is due to an instrumental problem. The wavelength dependence of the absorption coefficient is more deeply discussed in the revised manuscript, section 3.2.

Page 3932, line 9 - The C/F ratio is now more deeply analyzed in the end of section 3.2.

Page 3933, Conclusions - All the conclusions section was restructured.

Respect to the writing quality of the manuscript, it is now being corrected by a USA native and the revised version will be highly improved.

For other comments on organization and clarity of the paper, we almost fully accepted them and changed the revised manuscript accordingly.

References

[Perez et al.(2005)] Perez, C., Nickovik, S., Sicard, M., Toledano, C., Cachorro, E., and Baldasano, J.: Characterization of sahara dust events over the Iberian Peninsula: Lidar, sun-photometer and DREAM model simulations, Geophysical Reserach Abstracts, 7, 2005.

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[Querol et al.(2004)] Querol, X., Alastuey, A., Viana, M., Rodriguez, S., Artiñano, B., Salvador, P., Santos, S., Patier, R., Ruiz, C., de la Rosa, J., de la Campa, A., Menendez, M., and Gil, J.: Speciation and origin of PM10 and PM2.5 in Spain, *J. Aerosol Sci.*, 35, 1151 – 1172, 2004.

[Rodríguez et al.(2001)] Rodríguez, S., Querol, X., Alastuey, A., Kallos, G., and Kakaliagou, O.: Saharan dust contributions to PM10 and TSP levels in Southern and Eastern Spain, *Atmos. Environ.*, 35, 2433–2447, 2001.

[Vergaz et al.(.)] Vergaz, R., Cachorro, V., de Frutos, A., Vilaplana, J., Henriquez, D., Toledano, C., and Laulainen, N.: Characterization of two Saharan desert dust events in the southwestern of the Iberian Peninsula. Evaluation on its effect on UV radiation, submitted.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 5, 3921, 2005.

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