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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Physical and optical properties of aerosols over an urban location in Spain: seasonal and diurnal variability" *by* H. Lyamani et al.

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We would like to thank the anonymous referee #2 for the constructive and helpful comments, which will contribute to improve the quality of our manuscript.

We accept the criticism concerning the terminology "fine" and "coarse". Although we have stated in the manuscript the range of diameters covered by the APS, we will identify the range of smaller particles as particles in the range 0.5 to 1 micron in diameter, avoiding any confusion with the term "fine".

As we stated in the manuscript: "The study site is located in the southern part of the city and is close to the highway that surrounds the city and to the major traffic arteries."

In particular the station is about 500 m away from the highway that surrounds the city and about a similar distance from one of the principal avenues of the city, in this sense the station is close to heavy traffic, especially during traffic rush hours. We will include this additional information in the revised version of the manuscript. This will clarify any comparison with other stations located in urban environments with different features.

We agree with the reviewer on the comment about the cause of the day-to-day variations in winter. In this sense we will include a comment on the influence of the meteorological situation and the atmospheric mixing conditions. Concerning the influence of wind over scattering and absorption coefficients, in our discussion of the diurnal evolution (Section 4.2.1) we evidenced that as wind increases there is a decrease in the absorption and scattering coefficients. A study on the height of the mixing layer is under development in our group. For this purpose, due to the unavailability of radio sounding in our study area, we are using backscatter lidar profiles acquired at our station. According to our preliminary results the daily cycle of the absorption and scattering coefficients are clearly influenced by the daily evolution of the mixing height. Furthermore we detect a clear seasonal cycle of the maximum mixing height, with largest values in summer.

The ratio between the two ranges of particles analysed in this study has been studied in section 4.1.2, there the different contributions to the aerosol load has been discussed. The comment on the influence of the low mixing layer heights on the above mentioned ratio will be suppressed, according to the reviewer suggestion.

According to the reviewer, we will include as a suggestion our comment on “the secondary particles formation and traffic related particles re-suspension” and on “the diurnal variation of the single scattering albedo”.

General terms like “urban aerosol in Granada” will be suppressed in the conclusion section, while indication about the features of our station as heavily impacted by traffic will be included.

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The term “Diesel” will be substituted by “Fuel oil”.

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Interactive Comment