

Interactive comment on “A study on the relationship between mass concentrations, chemistry and number size distribution of urban fine aerosols in Milan, Barcelona and London” by S. Rodríguez et al.

Anonymous Referee #2

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General remarks

The presented study is based on a very complex data set from three European cities. The data set contains both physical and chemical parameters to describe air quality within a city. Therefore it may help to describe features of air quality problems in Europe. Some of the results are very interesting and new but they are not well highlighted in the current status of the paper. The paper contains a lot of information in terms of pictures and correlation coefficients but it should

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be better structured to make the results clear to the reader. I know that it is difficult to combine this huge amount of data in a reasonable way but it should be improved.

The language quality is not very good; it should be re checked by a native speaker if possible. There are lots of small typos and errors in grammar.

Comments in detail

Introduction

The introduction is too short and does not contain enough information or motivation for the paper. It reflects a little bit the problem of the paper: the combination of the different chemical and physical data, but what is really new and important? I miss at least a quick summary of former studies and of course a statement what is missing and why this paper is important and may help to close the gap. There are already many studies available from European cities, I think the authors should mention some more. A few results should be briefly summarized here and lead into the conclusion what is missing. What do you think is important to measure to answer open questions: mass, number concentration or chemical composition? Or the combination of everything? Why?

Study regions

The location of the three sites should be described here a bit more detailed. There can be big differences between locations within the urban areas, therefore it is important to know the local conditions, such as street canyon, traffic site, urban background. It would be good to have one or two more sites here, such as one in mid Europe and one in Scandinavia. I understand if you don't want to start the analysis again but it should be mentioned here that the three sites are not completely representative for whole Europe. And maybe it is a motivation to make another study with more cities. There are urban measurements

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e.g. in Germany and Scandinavia during that period available I guess.

Aerosol physical characterisation

What do you mean by TSI DMPS? As far as I know there is no commercial DMPS from TSI available, they are operated by a SMPS software. What is the model number of the SMPS or the DMA and CPC?

Results and discussion

How did you calculate DpN? Did you fit lognormal modes? How did you do that? It should be described here. The paper contains too many pictures, some of them with too much information (e.g., Fig. 3 and 6, they contain too many individual plots and finally they are too small to detect anything). Please reduce to number of pictures. The amount of information should be somehow reduced and this section re structured. There are few subsections like daily and seasonal evolution but the discussion is still mixed within the sections (e.g. on page 616 also daily variations are discussed). The section about seasonal variations is too long and should be split up. Many topics are discussed here, such as saharan dust, pollution, and new particle formation, but this is confusing for the reader. The topics should be discussed subsequently, so far everything seems to be mixed up.

Page 619, line 10ff: Why is the correlation coefficient much higher for Milan?

I miss a comparison of the major results, e.g. numbers, correlations with previous studies. There are several urban studies available, most of them do not cover the same variety of measurements as the presented one but individual results should be related to former ones.

Page 623, line 19: 'lesser' should be replaced by 'smaller'

What is the conclusion of the paper? Is there anything useful for further Eu-

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ropean legislation? Maybe one important result is that mass concentration is not enough to measure to say anything about particle sources and thus about health effects of aerosols.

Technical

Again, there are several typos: Examples: page 619, line 20 exiting should be existing The's' at the end of verbs is mostly wrong if it is there and missing in many cases

There should be always a space between number and unit, like "10 nm".

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 605, 2007.

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