

Interactive comment on “Long term measurements of submicrometer urban aerosols: statistical analysis for correlations with meteorological conditions and trace gases” by B. Wehner and A. Wiedensohler

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First of all we thank the referee for his pleasant comments to our work and the detailed suggestions. We tried to consider them or to answer using this platform.

General comments: As the referee suggested, we are planning measurements at differently polluted sites, meaning at different locations within the urban area and outside. One additional station is already operated for almost one year and two more will follow soon. I will add this remark as one outlook. One way to parameterise number size distributions is to fit lognormal modes. This would have been one way for this study too. However for this data set consisting of urban measurements it is probably not the best solution. Number size distributions in this study (urban) usually do not show

clear modes because they are influenced by many different emission sources. Fitting lognormal modes to such wide size distributions is very subjective and the automatic procedure has serious difficulties as well. However, modal parameters are a very important result for models. I will include a table with modal parameters for the mean size distribution as one important result for modellers. Trend analysis was performed without significant results, this is included in the text now.

Sorry, I forgot to mention the point about the lower temperature in winter leading to a higher nucleation rate. It is added now to explanations of Fig. 4.

Sorry, if the nomenclature for the statistical investigation is mistakable. But the main reference I used for this study (Einax et al.) calls the PC loadings consequently factor loadings. Obviously there is no general standard for these definitions. I will leave the factor loadings because I reference this book several times and the reader would be confused if he uses this textbook either. Temperature and humidity are connected to global radiation and atmospheric pressure for several meteorological situations. Including temperature and humidity results e.g. for the new particle formation events (PC2) in a positive correlation between temperature and global radiation and a negative correlation between global radiation and relative humidity with smaller factor values because they share now the influence of meteorology. And it gives no additional information. An additional explanation is now given in section 3.2.3.

The PCA was done for nearly every combination of measured parameters. The usage of CO did not give any useful result. Maybe the CO/NO_x ratio would be useful to consider for further studies, particularly close to streets. I will keep it in mind for investigation of those data. Relative peaks: maybe relative maxima is better and correct.

The PCA was performed for nearly every possible combination of variables. For PC 4 and higher it became always very speculative to interpret the results. Furthermore it was not the scope of this study to find correlations between the meteorological parameters. I fully agree that there may exist other processes not accounted in the PC model,

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but I would assume that the variables and processes relevant for particle concentration are considered in this analysis.

The revised manuscript will be submitted soon to the ACP Editors.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1699, 2002.

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