

## ***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**

**Anonymous Referee #1**

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Associations between increases in health risks and high particle concentrations in ambient air have accelerated the interest to achieve a better characterisation of PM in urban air. Especially the ultrafine particles have received increasing attention in this regard but underlying toxicological evidence for many health effects observed in epidemiological studies is lacking. A better characterisation of the urban aerosol could help in finding the most relevant parameters for health effects. The temporal and geographical distribution needs to be better assessed. Then there is also a need to better understand the importance of aerosol dynamics (coagulation and nucleation) on the concentrations of different particle sizes and the importance of the primary sources

(road traffic gasoline and diesel combustion being the most important in many urban areas).

In most studies of the urban aerosol only the total number concentrations have been measured and the measurements are normally only shorter field campaigns. What makes this paper particularly interesting is that it relies on a very extensive data set of both gas-phase and particle size resolved data during a 4-year period. The data was collected at a moderately polluted site in Leipzig, Germany.

A number of interesting results have been extracted from the data. But to some degree I was expecting that the analysis to provide even more detailed and quantitative information on the primary and secondary sources of urban particles and on the particle dynamics than has been achieved. In many instances I think that the authors jump to conclusions very early in the paper but then never really confirm these conclusions by other types of analyses than correlations. Most of the interpretation is based on correlations among different variables without really analysing the specific episodes or in other ways trying to understand the underlying controlling factors/processes.

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