

Interactive comment on “Number size distributions and seasonality of submicron particles in Europe 2008–2009” by A. Asmi et al.

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Many thanks for constructive and useful comments on the manuscript. We believe the document is now greatly improved.

Referee: *A statement, even a general statement, regarding the uncertainty of the main Aitken and accumulation mode statistics in the tables would be in order. If this could be put in the context of synoptic or seasonal variability that would be adequate, ie. very much less than, less than, comparable to, etc.*

Answer: We have now included a small section on Methods on measurement uncertainties (2.2.1 Uncertainty of mobility size spectrometer measurements) . The conclu-

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sions also now have a sentence ” We consider both the spatial and temporal variations of the aerosol number concentrations in Europe to be generally much greater than instrumental uncertainties.”, which considering the approximate instrument-to-instrument variability of 10% is a valid conclusions from the results.

Page 8911 “The number size distributions of particles are higher in summer than in other seasons, especially for the Aitken mode particles with dry diameters from 50 to 100 nm. This elevated number size distributions are accompanied by a slightly larger diameter of median distribution Aitken mode.” There is some room for confusion in the text here. I suggest that it be clearly specified whether you are referring to the particle number concentration that is “greater than” (lower or less than) or the modal, mean or median diameter that is larger (smaller). Adjectives such as “higher” should be avoided where possible. “Smaller” should not be used to refer to concentration, only diameter. Eg.: The number concentrations of particles are greater in summer than in other seasons, especially for the Aitken mode particles with dry diameters from 50 to 100 nm. These elevated concentrations are accompanied by a slightly larger median diameter of the Aitken mode.

We have generally changed ”higher” (in context to concentrations) to ”greater” and clarified the language in general.

This has hopefully clarified the text and removed any ambiguity.

It would be good to put this in context for cloud physicists with a sentence stating the critical cloud supersaturation and assumed (say sulfate) chemistry associated with 50 and 100 nm size limits. I know you said you would ignore this point and you did refer to McFiggans but a sentence from his work would be worth it in my opinion

We have now added two comparison supersaturations for these size limits in introduction, one based on pure substance and one on based on recent experimental results from SMR station.

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We have also corrected the typos and other corrections from Referee 1 (esp from the supplement given). The Table 4 have now been added with the station names. The main reason for using acronyms was to keep the tables in such size that they could fit (sideways) to one page ACP, so the final version of the tables is dependent on the technical details of the ACP publication process. We will try to make the tables as readable as possible. Figure 8 lines are removed and "equal log" is now used throughout the manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 8893, 2011.