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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Measurements of aerosol charging states in Helsinki, Finland" *by* S. Gagné et al.

Anonymous Referee #2

Received and published: 26 July 2011

Overall comments:

This manuscript describes experimental aerosol data from a mildly polluted urban site in Finland. Size distributions of the new ultrafine particles have been measured both by a typical, assumedly stepwise SMPS-method and a comparable method with no neutralizer. From the field data, the actual charging state of the particles compared to their steady charging state in the neutralizer, can be derived and the result may give additional information from the initial nucleation mechanism. Also two kinds of growth rates can be obtained from the spectra: charged and steady state. New results are derived, mostly confirming the previous findings that pre-existing particles seem to scavenge free small ions and therefore decrease the fraction of ion-induced nucleation and thereby the extent of overcharging to be observed. The value of 0.8 % for IIN

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fraction is consistent with previous data obtained elsewhere.

I think that the title does not describe sufficiently what has been done in the paper. The title should reveal the fact that both a) measurements have been performed and b) new type of data treatment has been applied and more or less quantified. Secondly, there seems to be a parallel numerously cited not-yet-published manuscript Leppä et al., 2011. I feel slightly uneased about the fact that some of the important actions in this manuscript are justified by citing that parallel paper Leppä et al., not yet available to the reader.

Specific comments:

Page 15884 Lines 12-13. Two thousand fits per day? Please modify the unclear sentence.

Page 15885 Line 12. How is the factor f_eq calculated? Please describe. Is it same for both polarities?

Page 15887 Lines 15-16. Unclear sentence. Please modify. Which are the four categories?

Page 15888 Lines 2-3. "This may be an indication. . ." Please clarify. What is that fact which may be the mentioned indication?

Page 15887 Line 2. First author's own name is misspelled.

Page 15887 Line 32. Initial "T" is missing for Dr. Petäjä.

Page 15915 Figure 1. Please indicate the row for 3.9 nm in the plot.

Page 15916. Figure 2. Please include units in the graph.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 15875, 2011.