

## ***Interactive comment on “Estimating neutral nanoparticle steady state size distribution and growth according to measurements of intermediate air ions” by H. Tammet et al.***

**H. Tammet et al.**

hannes.tammet@ut.ee

Received and published: 23 July 2013

The authors wish to thank the anonymous referees and the editor for their careful reading and valuable suggestions for the future research. The critical comments by two referees are in accord and present the suggestions:

Referee #1 wrote "The paper has several weaknesses in its approximations. Using almost like a literature value for N50-500 instead of measuring true number concentrations, assuming a constant value for GR1, not only as a function of size but also as a function of time. More generally, dealing with only average size distributions and other

C5036

averaged values is not very solid either. Making on-line measurements on e.g. particle size distributions and sink terms and repeating the analysis allowing the values to change dynamically in time, would gain much more valuable information on the neutral nanoparticles during quiet periods."

Referee #2 wrote "Authors are encouraged to obtain the statistical information on the GR and J during the quiet periods and compare with those during the burst periods. I also hope that authors would not exclude the possibility of the GR has negative values as well. As the authors would already realizes, the authors are encouraged to take advantage of the well-established aerosol instruments for directly measuring the particle size distribution of total particles in 3-500 nm range. It was a bit awkward that authors indirectly estimate the value of N50-500 and  $n_0(d)$  from the ion-mobility distributions."

The suggestions by the referees require the installing an additional instrument for recording of the aerosol particle size distributions and performing at least one year of simultaneous measurements with the intermediate air ion mobility spectrometer. Another action should be the updating of the theoretical model so that we could consider the dynamics of the growth flux and the growth rate when processing the measurements. We consider the present paper as an introduction into the future research showing that estimating of the growth flux and the growth rate according to the intermediate air ion measurements is possible. We hope that both suggestions by the referees are realistic and the follow-up results could be available after a few years.

We express extra thanks to referees for their benevolent concluding statements: referee #2 wrote "I honestly do not have any suggestion for further correction" and referee #1 made a final comment: "But since this study is first of its kind, I'm supporting publication of the paper in the present form."

---

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 13519, 2013.

C5037