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Interactive comment on “EUCAARI ion spectrometer measurements at 12 European sites – analysis of new-particle formation events” by H. E. Manninen et al.

Anonymous Referee #2

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The paper by Manninen et al. presents a very comprehensive set of new particle formation measurements from 12 different sites across Europe. A number of different environments were covered over a reasonably long periods of time. So far this is the most comprehensive experimental study of new particle formation events that I have seen. I am looking forward to see more manuscripts on this topic from the EUCAARI study,

The manuscript is well written and the data presented in a clear way. I would only have few minor comments and would recommend that the manuscript is published in ACP with only minor changes as suggested below:

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- 1) The manuscript could benefit from a short overview in the Introduction section on previous ion spectrometer measurement within and outside Europe. This would give a more global picture.
- 2) p.11265, l.8. Why is the specific reference Aalto et al., 2001 used for the DMPS?
- 3) p.11265, l19, sentence starting with: “The average charged... “Improve the structure of the sentence. You use “and” several times. Next sentence as well needs grammatical improvement.
- 4) Section 3.1.1 needs to be proof read. There are a number of grammatical mistakes. For example: p.11267, l24 “A day was classified as an event days...” Should be day instead of days. Same sentence was should be were.
- 5) p.11268, l.9. Using just the total number of events could be confusing as it also depends on the length of your campaign as is pointed out in the next sentence. For example the lowest number of events 59 were observed at Pallas. If the campaign at Pallas went as long as the campaign in Finokalia there could have been more observed events. I am not sure if it is worth presenting only the number of events.
- 6) p.11269, l.9, “The monthly event to non event ratio had a clear maximum during late spring...”. This is not obvious when one looks at the ratios (figures in the appendix) at individual sites. How was the average from Fig 4b calculated?
- 7) p.11270, l.15, “...Weingartner et al (1999) suggested...”, Wiengartner et al. did not suggest but have observed the most frequent number of events in winter. Please comment the difference between your study and Weingartner et al. study. Could this be just natural variability?
- 8) p.11279, l.11. Were the “bump” events observed in other coastal locations besides Mace Head or is it something typical for this station?
- 9) Section 3.3, I find the observation that the ion induced nucleation starts at different times than neutral nucleation very interesting. This was previously only observed at

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Hyttiala but now it was observed in different locations, but what is important with different starting times. It would be nice if the authors would discuss this in more detail and maybe suggest some explanations for the different observations.

10) p.11256, l.22. the word discovered is a bit to strong. Suggest using "found".

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 10, 11251, 2010.

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