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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.***

**H. E. Manninen et al.**

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We would like to thank the referee for the constructive comments to help us to improve the manuscript.

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Answers to the referee comments by Anonymous Referee #1 on our manuscript “EU-CAARI ion spectrometer measurements at 12 European sites – analysis of new-particle formation events” by H. E. Manninen et al.

1) P. 11264, line 11: the onset of nucleation is typically referred to as a vapor saturation

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ratio (in homogenous nucleation at a given nucleation rate) but not to a size as it is done here which may lead to confusion. Maybe the authors should be more precise here saying that the instruments were measuring below 1.2-2nm which is the size range where most of the cluster activation takes place.

We revised the sentence: 'Although the ion spectrometers measure freshly formed charged particles well below 1.2-2 nm which is the size range where most of the cluster activation takes place, the majority of these freshly formed particles are uncharged (Hörrak et al., 2001; Kulmala et al., 2007; Manninen et al., 2009b).'

2) On p. 11271, line 25, the authors motivate the determination of growth rates in order to investigate the amount of atmospheric condensable vapors. However, apart from the assumption that different vapors may participate in the growth of different-sized particles no quantitative estimates on the amount have been made.

From the growth rate and the condensation sink calculations we derived estimates for the condensing vapor concentration and its source rate following the analysis by Kulmala et al. (2001) and Dal Maso et al. (2002). We did not include these results to this manuscript to limit the length of this paper. These results will be published later by Nieminen et al.

3) On p. 11273, line 24/25, it is stated that no relation between condensation sink and strength/frequency of new-particle formation events was observed. I think this finding is essential (especially considering the diversity of measurement sites) and should be mentioned in the Conclusions section.

We added following sentence to Conclusions section: 'No clear relation between the values of condensation sink and the strength and frequency of new-particle formation events between the different sites were observed.'

4) Technical corrections: p. 11265, l. 12 and p. 11271, l. 24: same heading for sections 2.3 and 3.2. p. 11291, Table 4: abbreviation for instrument IGMA should be explained

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somewhere. P. 11295, Figure caption 3a: according to the text on p. 11268, l. 13 (and also the y-axis) Fig. 3a shows the fraction of event days relative to the number of all days instead of the total number of event days.

p. 11265, l. 12: Heading changed to Calculating particle formation and growth rates, p. 11291, Table 4: Asterics added to the table (Inclined Grid Mobility Analyzer, IGMA), P. 11295, Fig 3a caption corrected.

5) Typos: p. 11265, l. 23: . . .can deviate. . ., p. 11267, l. 24: . . .event day. . ., p. 11268, l. 11: . . .number of events. . ., l. 15: . . .fraction of event days. . ., p. 11270, l. 26: . . .places around Europe. . ., p. 11271, l. 11: A “bump” event occurs. . ., p. 11272, l. 12: This holds true. . ., p. 11297, Figure caption 5d: “bump” in Mace Head

All suggested corrections done.

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