

***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 #1

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The manuscript entitled “EUCAARI ion spectrometer measurements at 12 European sites – analysis of new-particle formation events” by Manninen et al. provides an overview of new-particle formation events measured at 12 different sites across Europe. The strength of this manuscript clearly lies in its approach to show comprehensive measurements made in a wide variety of environments yielding information on the spatial and temporal behavior of new-particle formation. The manuscript is well-written and data are presented in a clear way. Therefore I recommend this manuscript for publication in Atmospheric Chemistry and Physics. Minor modifications/corrections are suggested below.

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

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.

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.

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 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.

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

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