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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Size-dependent particle activation properties in fog during the ParisFog 2012/13 field campaign" *by* E. Hammer et al.

Anonymous Referee #1

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General comments

This manuscript presents results from a measurement campaign focusing on aerosol-fog interactions. The measurements were performed in France, at a measurement station near Paris. The measurement system, equipment and data analysis are quite similar to those used in many aerosol-cloud interaction studies. However, the application of these methods for fog research in this study has provided new, interesting observations which improve the scientific knowledge about fog formation. In general, the manuscript is well written and I have only a few comments. The manuscript meets the criteria for publication in ACP after minor revisions.

Specific comments

Introduction: I would suggest changing the order of the third and fourth paragraph. This way the first part of the introduction would deal with the background and theory and the rest would explain what needs to be done and what is done in this study.

Section 2.2: Please explain why you decided to try different cut-off sizes for the interstitial inlet. Just for comparison purposes or did you decide to change the inlet cut-off after noticing that the wet threshold diameter was well above the 1 μm limit?

Section 2.2: In the beginning of the second paragraph you mention "dried number size distributions of total and interstitial particles". Does this mean that the interstitial inlet also had some heating? Please clarify.

Page 9494: You can remove the first three rows of this page, the same information is already given in chapter 3.5.

Page 9495, rows 13-14: Please give the number of the event (F15?) here as well, this would make it easier to check the relevant figures and tables.

Chapter 4.3 and table 2: Here you compare light scattering coefficient by hydrated particles and droplets smaller than 10 μm (bs, hyd + bs, drop) with the particle extinction coefficient, pec, by saying that the difference between these two is moderate. In some cases this is true, but there are many cases where the pec is clearly higher. Wouldn't it be more realistic to present the ratio bs, hyd/pec instead the bs, hyd/(bs, hyd + bs, drop)? Or then present both ratios in table 2 for comparison purposes.

Figure 4: Please change either the color of the curves in figures b and c or then the background colors indicating the type of the fog events. This would make the figure clearer as now the colors are too similar.

Figure 8: The background colors indicating the type of the fog events could be a bit lighter, thus making the figure clearer.

Technical corrections

Page 9478, row 21: please check the years.

Page 9494, rows 4-5: combine this one sentence with the following paragraph.

Some typing errors etc.:

Page 9483, row 12

Page 9485, row 12

Page 9490, row 14

Page 9493, row 4: should be Figure 7c.

Page 9494, row 4: Fig. 8c

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 9475, 2014.