

Referee #1:

1) In the abstract: "the dry and wet activation diameters did not exceed 0.496 and 7.25 um respectively". Should be rather "the dry and wet activation diameters were not smaller than 0.496 and 7.25 um respectively"?

2) The Authors have addressed my main discussion points on the original manuscript. In their rebuttal to question n.2, they acknowledge that the approach used in this paper substantially neglects the effects of kinetics in droplet activation and that this will be the subject of a future publication. It could be useful to add a sentence about that in the conclusions.

Referee #3:

Introductory editor comment: I reordered the referee comments as some of them point to similar questions.

1) Referee comment: One of the issues bothers me that fog formation and its intensity related to temperature and RH(Sw) are not provided. Here we know nothing about temperature and they are talking about winter fog. Clearly, Paris T is around 3C daily/monthly but this is in the city. Over the project site it can easily goes to zero. If this is winter fog why T info not given, and authors insist not to provide it.

Editor comment: Can you provide temperature ranges during the individual fog events or refer to suitable other references?

2) Referee comments:

- Also, they talk about fog but no Visibility is given, to me this is very weird approach study fog.
- Intensity of fog is defined based on Vis values, not the fog layer thickness. These fundamental concepts are not emphasized properly.

Editor comment:

This is a fair comment (also by Referee #2) as visibility is usually reported in fog studies. I understand that another manuscript is in preparation and some visibility data are provided by (Elias et al., 2009), Dupont et al. (2015). However, I think in the current study a brief presentation of visibility data should be provided as well in order to be able to compare to other fog studies. They should be added exemplarily as an additional panel in Figure A2 or – even better – in Table 2 for all fog events.

3) Referee comment: In addition, fog size is usually less than 30 micron, >30 micron becomes drizzle. No information is provided if there are droplets <30 micron, and what is their size. They should provide N_d and V_{is} for these cases.

Editor comment: A discussion on this could be added at the beginning of Section 5 where you mention size ranges of droplets. Showing some representative droplet spectra for the full size range (i.e. up to 50 μm) from the FM-100 instrument would add to this discussion. Did you observe drizzle?

4) Referee comments:

- I see no info on V_{is} , T, MVD for fog droplets.
- Like to see LWC~MVD and LWC~ N_d for all fog cases.

Editor comment:

I understand that both LWC and MVD will change over the life cycle of the fog. However, as previous studies have discussed fog LWC as well, presenting a snapshot of these values is a fair approach. Does the non-linearity as discussed for Figures 8 and 10 (see comment 5) show up in the LWC-MVD and/or LWC- N_d relationships as well? If so, they might even support your discussion in Section 4 and exemplary figures should be added to the SI – unless, they have been presented and discussed in another study on ParisFog and could be referenced accordingly.

While Figure 12b includes LWC and N_d data, it is hard to tell based on this presentation whether any relationship exists.

5) Referee comment: I went over the paper again; specifically Fig. 2 should show some results on N_d - N_a relationships (see Gultepe et al Fig. 3 from low level clouds, INTERNATIONAL JOURNAL OF CLIMATOLOGY, VOL. 16, 94 1-946 (1 996)) Some discussion should be provided on this issue.

Editor comment: Please add a brief discussion of approach by Gultepe and Isaac in your Section 4.2. Can your data be fit to the equation in the form as provided by them? How do your coefficients compare to the ones in their study? How do the fit compares to the ones you discuss already in Section 4.2?

6) Referee comment: Also, Fig. 8 of the submitted paper with same paper above. Fig 8; I see no relationship between N^* and N_{act} based on K values, it means K doesn't matter? Or why this result is obtained.

Editor comment: In my opinion, you have sufficiently explained the very sensitive feedback between water vapor, aerosol number concentration, and suppressed supersaturation. Could one generalize that this is specific to fog where typically very low superaturations are reached as

opposed to (more convective) clouds with generally higher supersaturations? A brief comment along these lines in Section 4.2 will be helpful to even better understand the usefulness of Na-Nd relationships that were developed for clouds vs fogs, and to support your discussion at the end of Section 4.3.

7) Referee comment: I see still not clear responses for my questions on averaging scale raised before.

Editor comment: The reviewer had raised the concern in the original comment that averaging over the whole fog event might not lead to a representative value. Can you comment on that?

8) Referee comments:

-Also, I feel that difference between this paper and previous one submitted a few years ago should be discussed why the current one is an improved version of previous one.

-In addition, some explanation between this manuscript and previous one (submitted a few years ago) should be provided in discussions.

Editor comment: This might be a question that should be clarified with ACP's editorial office. I am not sure if it might be possible to add a comment to your previous ACPD paper that the current one is the revised and updated version. As an alternative, one could think about withdrawing the 2015 paper. I am not sure whether the referee suggests to referring to your previous paper in the current manuscript – but in any case, I do not think that you should do this.

9) Referee comment: Overall, authors responses were not satisfactory in general, and here we are again have similar issues.

Editor comment: After responding to my comments above, I think that all referee comments will be addressed satisfactorily.

Technical comments by the editor:

p.1, l. 19: the activated fraction at the beginning of the event ~~are~~ IS...

p. 2, l. 21: droplet size distribution

p.2, l. 23: replace 'important' by 'significant'

p. 2, l. 23 and 24: droplet concentration

p. 2, l. 30: 'They also produce fog events...' – It is not clear what 'they' refers to. If it refers to 'numerical simulations' replace 'produce' by 'predict'.

p. 3, l. 3: particles

p. 3, l. 4 : three winter campaigns

p. 3, l. 13 : particle concentration values

p. 4, l. 10 : Burnet et al., 2012 and Elias et al., 2015 show ...

p. 4, l. 21: ‘The two instruments do not match perfectly each other over particles from between 4 and 8 mm,...’ – does this mean ‘The measurements of the two instruments do not match perfectly in the size range of 4 to 8 mm,...’? =- Please reword.

p. 4, l. 26: Elias et al. (2015) chose ...

p. 4, l. 26 : bin resolution

p. 4, l. 29: or some can be counted ...

p. 4, l. 30: ‘Nevertheless’ – misspelled

p. 5, l. 4: than the efflorescence point

p. 5, l. 26: time lapse

p. 6, l. 3: as a function

p. 6, l. 18: general trend points...

p. 7, l. 19: replace ‘chemistry’ by ‘chemical composition’

p. 7, l. 19: whether or not...

p. 7, l. 26: hygroscopicity parameter.

p. 8, l. 5: wet aerosol size distribution

p. 8, l. 16: has to assume

p. 9, l. 16: ‘the mixing with clear air has similar consequences than of external mixture for aerosols’ – I am not sure that I understand this sentence. Please clarify.

p. 10, l. 6: hygroscopic growth

p. 10, l. 10: would have implied

p. 10, l. 01: aerosol particles

p. 10, l. 27: responsible for

p. 10, l. 28; l. 29; l. 31 etc: replace ‘kappa’ by Greek symbol

p. 11, l. 14: are very lows

p. 11, l. 15: as already shown

p. 11, l. 23/24: ‘Obviously because of the uncertainty interval of Nact is very broad.’- This looks like an incomplete text fragment.

p. 12, l. 26: These results have been fitted using three different equations...

p. 13, l. 19: there are no obvious differences

p. 13, l. 29: 'grow' should be 'growth'

p. 14, l. 17: Recent work

p. 14, l. 18: allowing the sun to warm it - (please check meaning!)

p. 14, l. 22: size and number

p. 14, l. 25: 'forthcoming' – misspelled

p. 15, l. 17: replace 'there are exceeding vapor' by 'there is vapor in excess'

p. 15, l. 27: as high as 304 cm⁻³

p. 16, l. 5: not necessarily consistent

p. 17, l. 5: aerosol particles

p. 17, l. 14 : measured range

p. 17, l. 15: 'bias' misspelled

p. 17, l. 17: 'Despite that a stratus lowering fog appears to be associated with lower aerosol loading than **with** a radiation fog event' – Is the second 'with' redundant? As it reads, it suggests that stratus lowering can be associated with radiation fog – which seems wrong.