

## ***Interactive comment on “Radiation in fog: Quantification of the impact on fog liquid water based on ground-based remote sensing” by Eivind G. Wærsted et al.***

### **Anonymous Referee #2**

Received and published: 7 June 2017

#### **1 Main Review Points**

This paper presents a study of how fog liquid water is impacted by radiation balance. Ground-based remote sensing observations of seven fog events in the Paris region are used in the analysis. The manuscript is well-written, clearly structured and of a very high scientific quality. I highly recommend publication in ACP.

The main request I have is to somewhat more clearly highlight how representative or not the findings can be expected to be, in the main part of the manuscript as well as in the abstract.

C1

#### **2 Minor Comments**

- Page 1, line 15 (henceforth 1-15 etc.): what is meant by 'renewing' here? Doubling? With a rate of 40gm-2h-1 or greater, it should be less than one hour, in this case.
- 1-17: 100% of what?
- 1-22: 30% of what?
- 7-2: Why 15 minutes? Is this the temporal scale at which you expect changes to occur?
- 7-2: Why only one event with clouds above, if you suspect this type of situation to be so important for radiation balance? What is the potential for generalization?
- 7-20: Why do you apply averaging to some parameters and not others?
- 7-26: Do you mean 'at the surface'? If not, how do you determine visibility for situations with cloud-base height 'close to the surface'?
- 7-26: Given that the ceilometer is mostly blind below  $\sim 50$  m, what do you do with these situations, if they occur at all?
- 11-2: Please explain what is meant by 'renew' here (and in the following sections).
- 12-15: "The two parameters..." - Is this a qualitative statement? If not, can you provide a correlation coefficient, please?
- 13-5: Is there no way to test this (ice phase) assumption using measurements?
- Conclusions section: What can be learned from your findings to improve numerical weather prediction?

C2

### 3 Technical Remarks

- 2-3: real time
- 2-5: Continental fog often forms by
- 2-22, 3-2: fogs → fog [I am not sure the plural exists, and there is no need to use it here.]
- 3-3: methodS or methodOLOGY
- 3-16: 10m above ground
- 3-24: wood → forest
- 7-10: fogs → fog [I am not sure the plural exists, and there is no need to use it here.]
- 8-4: only ON the liquid...
- 11-26: higher by 14g... on 8 Nov
- 14-27: above the fog ARE thus
- 18-11: rateS
- 21-34: is occurring → occurs
- 22-3: contributionS
- 30-Fig1: In my version of the manuscript, some of the text is somewhat compressed (Winiarek)
- 30-Fig3: Maybe decrease size of captions to avoid overlap with labels (as in b and h)

C3

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-292>, 2017.

C4