Anonymous Referee #3

We would like to thank you sincerely for your precious support to correct the text, and all your suggestions. Before answering to your questions, we must confess that there was an error in the coding of the deposition process : the deposition velocity was mistakenly multiplied by the volume of the grid, corresponding to a ratio of 25 for all the simulations at 5m resolution (so a deposition velocity of 50 cm/s instead of 2 cm/s was actually applied), and to a ratio of 4 for the simulation at 2m resolution (noted DX2). Consequently, the deposition effect was overestimated.
All the simulations except the one without deposition (called NDG) have been run again and most of the figures have been updated. For the REF simulation (with a deposition velocity of 2 cm/s), the discrepancies with the observed microphysical fields are a bit stronger (cloud mixing ratio and droplet concentration more overestimated), but the DE8 simulation (deposition velocity of 8 cm/s as it was requested by one of the reviewers) presents a significant improvement. The signature of the fog onset at elevated levels in the REF simulation is not so marked, and is more evident in the DE8 simulation, showing that both the tree drag effect and the deposition are necessary to reproduce the formation of fog at elevated levels. The new results do not modify the analysis of the fog event and the conclusions of the study.
The text has been also reduced to answer to the reviewers : the sensitivity test on the initial conditions has been removed, as well as the corresponding figures. The length of the text has been reduced as expected. Lastly, the text has been revised by an english native speaker.

This paper presents large eddy simulations of a radiation fog event for which extensive research quality observations were available. The main focus of the paper is to uncover how different aspects of the model dynamics affect the fog evolution, and sensitivity to the surface treatment, initial conditions and model dynamical formulation are investigated. Whilst the work is interesting, and ultimately worthy of publication, I feel extensive modifications to the manuscript are required before it is suitable for publication.

Firstly, the manuscript is very difficult to read, due to numerous spelling and grammatical mistakes. A revised version would benefit from extensive proof-reading and typographical editing, possibly with the help of a native English speaker.

The text has been revised by a native speaker of English.

I have provided suggestions for the abstract below, to give the authors an idea on the level of modification required:

L2 - should say "...during the ParisFog..."
L4 - should say "...of a tree barrier..."
L7 - should say "...as in the observations, and..."
L10 - should say "...meaning that grid convergence..."
L12 - should say "...and had a similar effect to removing the tree barrier."
L13 - should say "...allows us to..."
L13 - should say "...necessary to correctly simulate the fog life cycle at high resolution."

OK, thank you.

Secondly, the manuscript lacks structure and coherence. It currently just presents a long list of things you have done, with no real theme linking everything together or justifying the various experiments. The introduction should focus on the specific problem you are trying to address - how dynamics affects the evolution of fog, what specific questions are you trying to answer? This should then provide justification for the sensitivity experiments you conduct - how do they help you answer the questions?

The conclusions should then tie all this together and answer those questions. It is possible that in doing this, you may be able to shorten the text (which is currently quite long) and number of figures, to only focus on what is really relevant.

In the introduction, this sentence has been introduced : « In order to establish the main ingredients driving the fog life cycle and the microphysical fields, and to evaluate how dynamics affects the evolution of fog, sensitivity experiments are conducted with the model considered as a laboratory. »

In the conclusion : « Various sensitivity tests allowed to identify the main processes affecting the evolution of fog. »

The text has also be shortened as the sensitivity tests on the initial fields have been removed. It should give more structure and coherence to the paper.

I only have two specific scientific comments:
Sect 2.3.2 - why do you choose an empirical diagnosis of visibility based on the cloud water content and drop number, rather than calculating the visibility accurately from Eqn. 7? With the complicated microphysics scheme you have available, you should be able to calculate the extinction coefficient directly, e.g. as done by Clark et al. (2008).

You are right but the objective here was not to calculate the visibility as accurately as possible but to estimate the best diagnostic relationship often used by the models.

P9, L32 - do you have observations of the surface or soil temperatures which you could compare to the model here to explain the difference in upwelling LW radiation?

We have observations of the surface and soil temperatures but we do not give them a good degree of confidence as they present strong differences with 1m temperatures.