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Atmospheric Chemistry and Physics Discussions

Interactive comment on "MACC regional multi-model ensemble simulations of birch pollen dispersion in Europe" *by* M. Sofiev et al.

Anonymous Referee #1

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General remarks

To my knowledge, this is the first attempt to calculate birch pollen concentrations based on an ensemble of dispersion models. I strongly support this approach as it represents a state-of-the-art method to quantify model uncertainties. For birch pollen this is especially important as the uncertainties are quite large.

The text is generally clear and precise. The arguments are logical and well presented. The relevant literature is appropriately reviewed. However, there is a number of points that should be improved (see specific remarks). In addition, the use of the English language should be checked (especially the use of articles, some examples are given in the specific remarks).

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Specific remarks

1. Line 156: treaded => treated

2. Line 191: provide a reference or justification for stopping the pollen release for RH>80%.

3. Lines 240 and 241: provide references for the diameter and for the density.

4. Line 208: add article before “Alps”

5. Line 217: the language should be improved: . . .most samplers were located at heights from 10m to 30m on the roofs of suitable buildings.

6. Line 293: what period was used to calculate the statistics?

7. Line 305: add article: over the majority; replace "or" by "of"

8. Line 309: How is the season start defined?

9. Line 334: How about uncertainties in the birch distribution?

10. Table 1: Most models have just very few vertical layers. It is very hard to imagine that birch pollen transport can be modeled with just three vertical model layers (LOTOS-EUROS). Please provide justification for the use of just 3 vertical levels (e.g. in line 230).

11. Figure 4: Make sure “zero” appears just once in the color bar.

12. Figure 6: It is hard to see the difference between the two left panels and the two right panels, respectively. I recommend to use a categorical color bar (as in Figures 1-5).

13. Figure 7: the upper right plot implies that the model performance at the north-eastern stations is much lower than at the rest of the stations. However, I assume that this impression is just due to the large birch pollen concentrations in north-eastern Europe. Normalizing with the median of the station data could help. Again, in the

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lower right panel a categorical color bar should be used. It is impossible for the reader to distinguish between 0.0 and 0.2. Additionally, it is important to provide information on the significance of the correlation coefficients (p-values or 5% level). Without this information, the correlation coefficients cannot be interpreted. It seems to me that the upper left panel is just the difference between the left panels of Figure 6. If that is the case, it can be omitted.

14. Figure 8: label all y-axes and provide significance information for the correlation coefficients.

15. Figure 10: Why do the relative frequencies in the left panel not sum up to 1? What period is the right panel based on?

I recommend publication after minor revisions.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 8243, 2015.