We would like to thank Dr. van Pinxteren for his helpful comment which improved the manuscript. Answers to the comment are written in blue. Changes in the manuscript are marked with red.

Interactive comment on "Exploring sources of biogenic secondary organic aerosol compounds using chemical analysis and the FLEXPART model" by Johan Martinsson et al.

D. van Pinxteren

dominik@tropos.de

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This is a nice and interesting approach to fold back trajectories with land surface data for qualitative aerosol source apportionment. It strongly reminds me of some of our earlier work (van Pinxteren et al., 2010), where we derived a "residence time" parameter very similar to the "exposure" parameter described here and included it into a PCA as done here as well. We used HYSPLIT back trajectory ensembles, which might give somewhat coarser results than FLEXPART footprints, but nevertheless proved themselves valuable in a number of further qualitative source apportionment studies, including one on small-chain dicarboxylic acids (van Pinxteren et al., 2014). The authors might want to consider these papers and maybe reassess their statement on P10 L11-12 that such information cannot be derived from simple trajectories.

We have removed the above-mentioned statement and included an acknowledgement to the study by van Pinxteren et al. 2010: *"van Pinxteren et al. (2010) demonstrated how air mass exposure to land cover affected the measured size-resolved organic carbon (OC), elemental carbon (EC) and inorganic compounds at a receptor site in Germany by using the HYSPLIT model."* This sentence is to be found in the introduction.

References

van Pinxteren, D., Brüggemann, E., Gnauk, T., Müller, K., Thiel, C., and Herrmann, H.: A GIS based approach to back trajectory analysis for the source apportionment of aerosol constituents and its first application, J. Atmos. Chem., 67, 1-28, doi: 10.1007/s10874-011-9199-9, 2010.

van Pinxteren, D., Neusüß, C., and Herrmann, H.: On the abundance and source contributions of dicarboxylic acids in size-resolved aerosol particles at continental sites in central Europe, Atmos. Chem. Phys., 14, 3913-3928, doi: 10.5194/acp-14-3913-2014, 2014.