Supplement of Atmos. Chem. Phys., 15, 6993–7002, 2015
http://www.atmos-chem-phys.net/15/6993/2015/
doi:10.5194/acp-15-6993-2015-supplement

Atmospheric Chemistry and Physics Open Access

Supplement of

Seasonal differences in oxygenated organic aerosol composition: implications for emissions sources and factor analysis

F. Canonaco et al.

Correspondence to: A. Prévôt (andre.prevot@psi.ch)

Paul Scherrer Institute (PSI) Switzerland

Supplementary material

Winter 2011

The solution of the source apportionment for the winter 2011 is summarized in Fig. S1, Fig. S2 and Fig. S3. Similar to the solution over the full year, the diurnal cycle of HOA is similar to that of NO_x, the cooking factor manifests a peak at noon and in the early evening, BBOA is slightly higher at night due to domestic heating in winter and SV-OOA is temperature-driven.

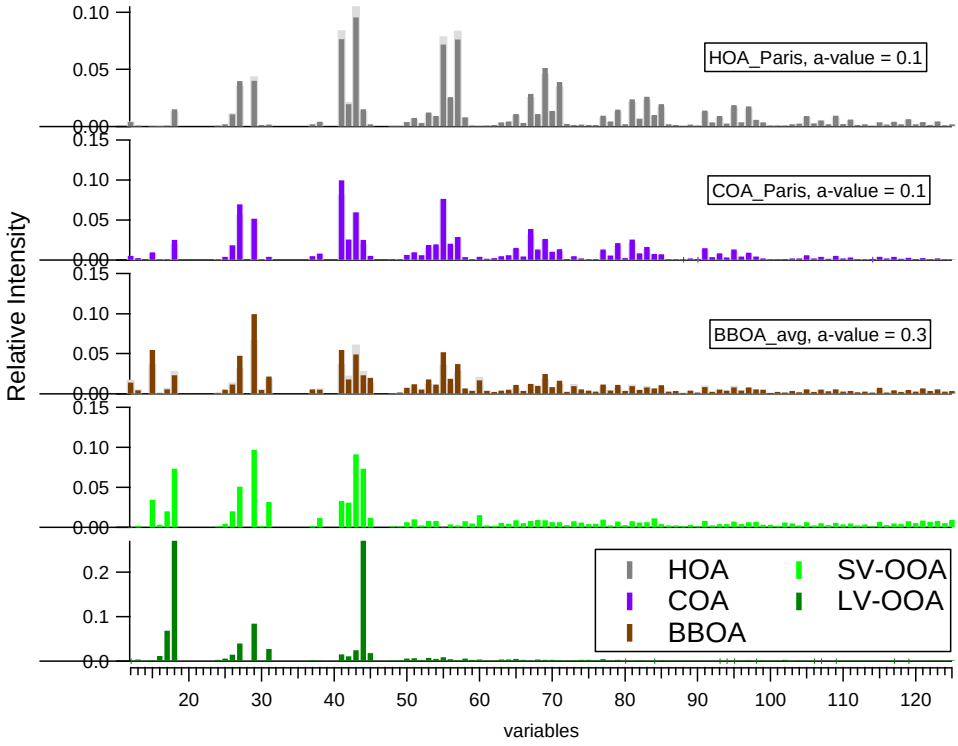

Fig. S1 The factor profiles for the source apportionment during winter 2011. The gray bars in the back represent the constrained mass spectra employed, i.e. HOA_Paris and COA_Paris from Crippa et al. (2013) and the averaged BBOA_avg from Ng et al. (2011).

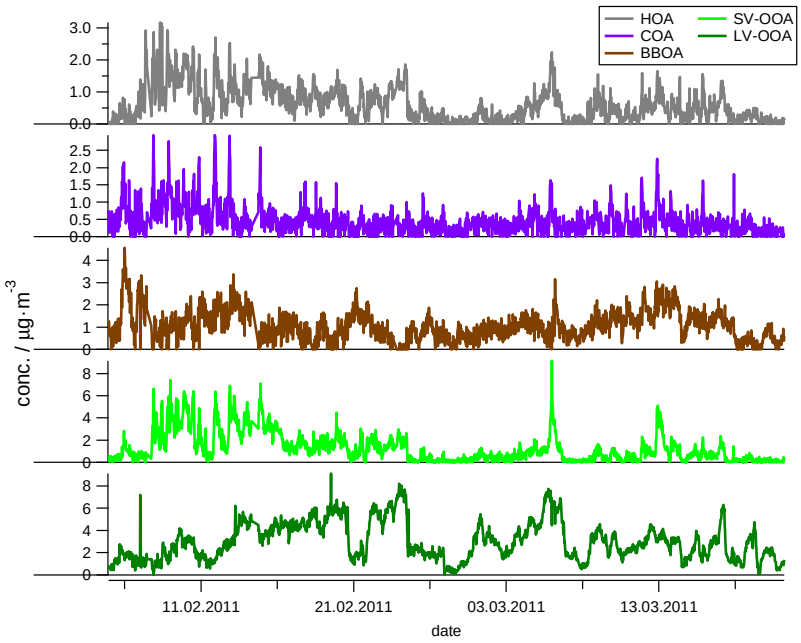

Fig. S2 The factor time series for the source apportionment for the winter 2011.

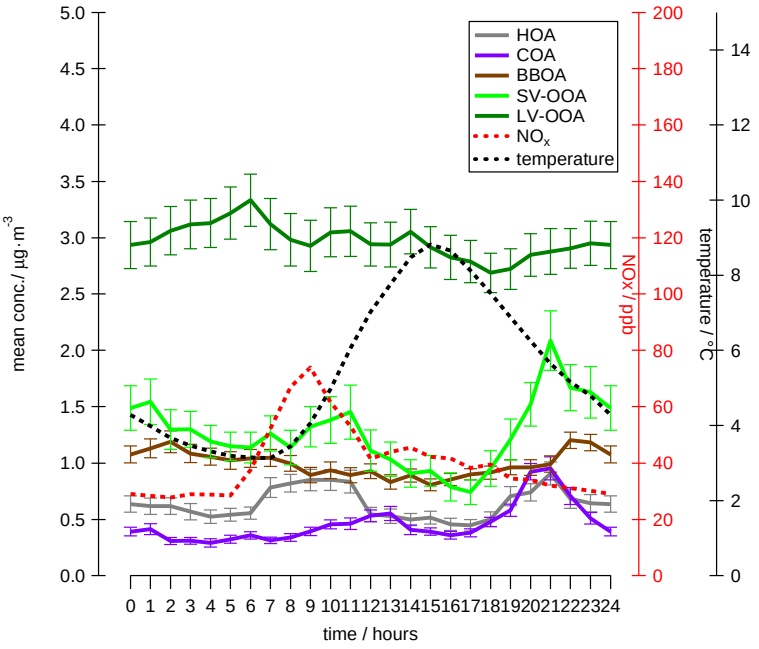

Fig. S3 The week-days diurnal cycles of the five factors of the source apportionment during winter 2011. The black dashed line is the diurnal cycle of the temperature and the red dashed line the one of NO_x. The error bars represent the standard deviation of the mean.

Summer 2011

The solution of the source apportionment for the summer 2011 is summarized in Fig. S4, Fig. S5 and Fig. S6. Similar to the solution over the full year, the diurnal cycle of HOA is similar to that of EC, the cooking factor manifests a peak at noon and in the early evening, BBOA is slightly higher during the evening due to most probably barbequing activities in summer and SV-OOA is temperature-driven.

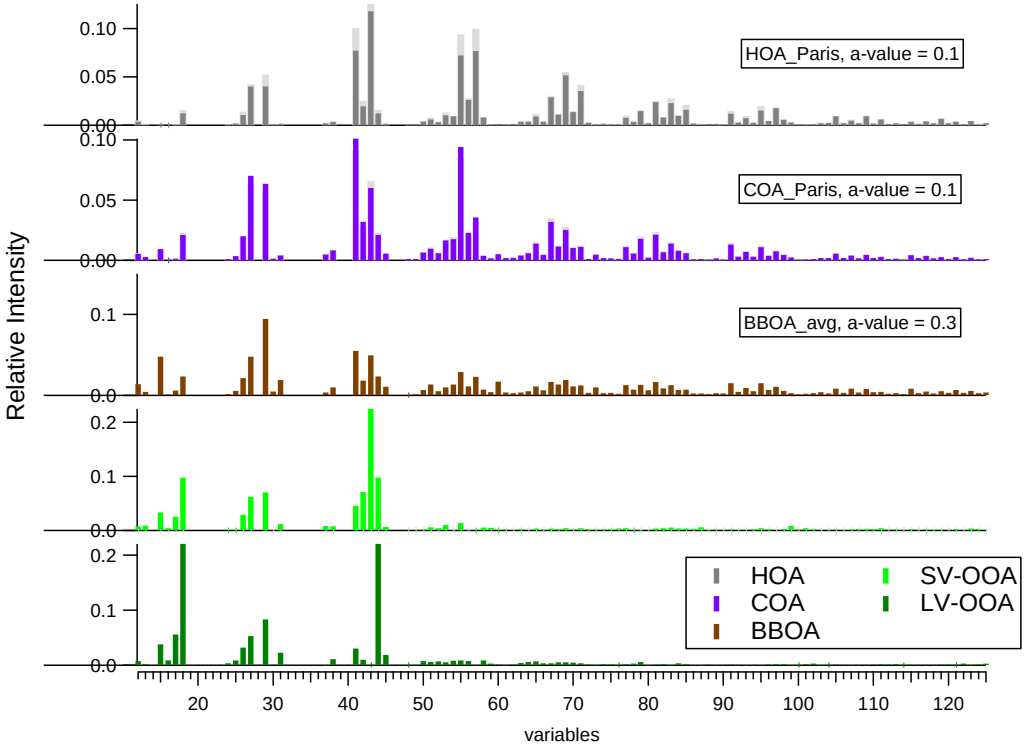

Fig. S4 The factor profiles for the source apportionment over the summer 2011. The gray bars in the back represent the constrained mass spectra employed, i.e. HOA_Paris and COA_Paris from Crippa et al. (2013) and the averaged BBOA_avg from Ng et al. (2011).

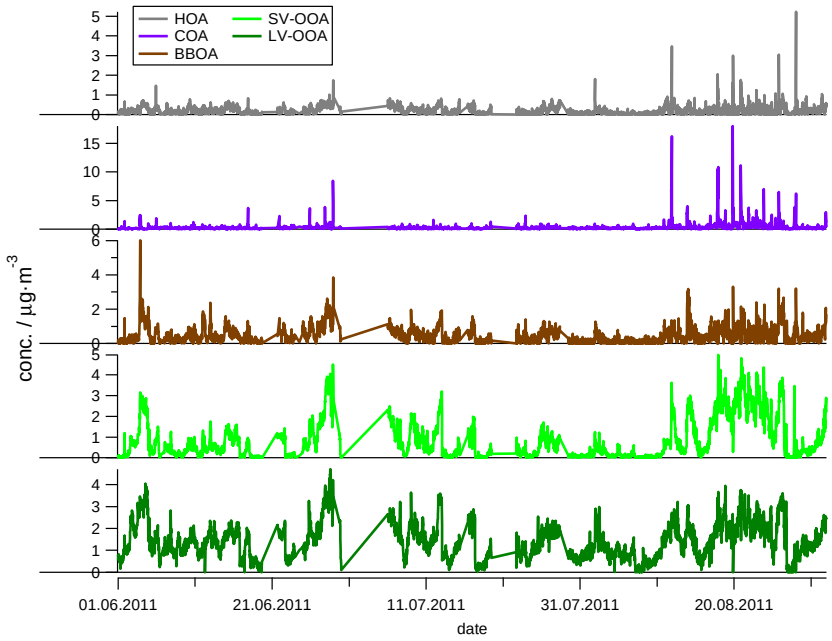

Fig. S5 The factor time series for the source apportionment over the summer 2011.

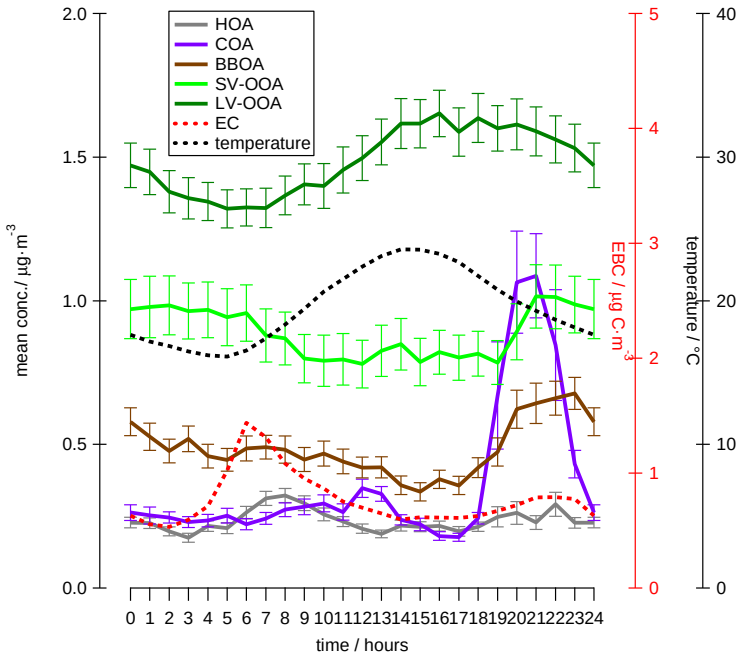

Fig. S6 The week-days diurnal cycles of the five factors of the source apportionment for summer 2011. The black dashed line is the diurnal cycle of the temperature and the red dashed line the one of EBC, since NO_x

wasn't measured during summer 2011 due to technical issues. The error bars represent the standard deviation of the mean.

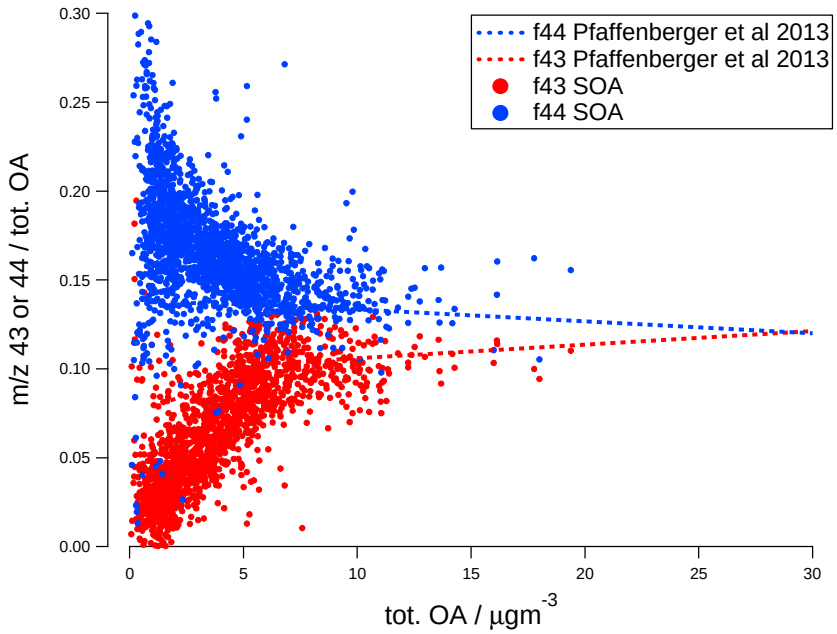

Fig. S7 *f*44 and *f*43 as a function of OA mass for the summer (data points) and α-pinene data from smog chamber experiments by Pfaffenberger et al. (2013) (dashed lines). The x-axis is cut at 30 µg·m^{-3} in order to better visualize the ambient data.

References

Crippa, M., DeCarlo, P. F., Slowik, J. G., Mohr, C., Heringa, M. F., Chirico, R., Poulain, L., Freutel, F., Sciare, J., Cozic, J., Marco, C. F. D., Elsasser, M., José, N., Marchand, N., Abidi, E., Wiedensohler, A., Drewnick, F., Schneider, J., Borrmann, S., Nemitz, E., Zimmermann, R., Jaffrezo, J.-L., Prévôt, A. S. H., and Baltensperger, U.: Wintertime aerosol chemical composition and source apportionment of the organic fraction in the metropolitan area of Paris, Atmos. Chem. Phys., 13, 961-981, 2013.

Ng, N. L., Canagaratna, M. R., Jimenez, J. L., Zhang, Q., Ulbrich, I. M., and Worsnop, D. R.: Real-time methods for estimating organic component mass concentrations from aerosol mass spectrometer data, Environ. Sci. Technol., 45, 910-916, 10.1021/es102951k, 2011.