

Organic Aerosol (OA) source apportionment using “Sliding Window” Positive Matrix Factorization (PMF) approach applied to 1-year Aerosol Chemical Speciation Monitor (ACSM) measurements in the region of Paris, France

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The Multilinear Engine (ME-2) source apportionment toolkit (Source Finder, SoFi v4.6, <http://www.psi.ch/acsm-stations/me-2>; Canonaco *et al* 2013) was applied to 1-year continuous OA measurements monitored by an ACSM (Aerodyne Research Inc., MA, USA) from september 2011 at the French SIRTA atmospheric supersite (Site Instrumental de Recherche par Télédétection Atmosphérique; <http://sirta.ipsl.fr>) within the EU-FP7 ACTRIS program (Aerosols, Clouds, and Trace gases Research InfraStructure Network; <http://www.actris.net>). This sampling site located 20km southwest from Paris (~12 million inhabitants) and is representative of regional background particulate pollution.

The “Sliding Window” PMF consisted in dividing the database into 1-month datasets with 15 common days between two consecutive periods and then applying a classic PMF analysis using SoFi. This approach provides a seasonal perspective of specific OA source properties (e.g. traffic, residential wood burning) by following their mass fragmentation profiles.

Two factors were clearly identified during the long-term monitoring: a hydrocarbon-like OA (HOA) factor usually associated to Primary Organic Aerosol (POA) emissions and an Oxygenated OA (OOA) factor thought to be linked to Secondary Organic Aerosols (SOA). Additional factors were also clearly identified depending on the season: Biomass Burning OA (BBOA) observed during wintertime, as well as semi-volatile and low-volatile OA (SV-OOA and LV-OOA, respectively) during some specific sampling periods. The complete results will be presented and discussed here.

[1] Canonaco *et al* (2013) *AMT* 6, 3649-3661