Seasonal characteristics of Organic Aerosols Sources in Cape Corsica obtained by ACSM and monthly resolved Source apportionment (PMF/ME-2)

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As part of the Chemistry-Aerosol Mediterranean Experiment (ChArMEx, http://charmex.lsce.ipsl.fr/), and the CORSiCA (http://www.obs-mip.fr/corsica) program, long term observations of real-time chemical composition of submicron aerosols were initiated since mid of 2012 at the Cape Corsica atmospheric supersite (http://gaw.empa.ch/gawsis/reports.asp?StationID=2076203042).

Submicron organic aerosols (OA) and the major inorganic salts (sulfate, ammonium, nitrate) were monitored every 30 min using an Aerosol Chemical Speciation Monitor (ACSM; Aerodyne Res. Inc. MA, USA). Quality control of this large dataset (20-month continuous observations) was performed through closure studies (using co-located SMPS and TEOM-FDMS) and direct comparisons with other on-line / off-line instruments running in parallel (filter sampling . . .).

Source apportionment of OA was then performed on a monthly basis using the SourceFinder software (SoFi v4.5, http://www.psi.ch/acsm-stations/me-2) allowing the distinction between hydrogen- and oxygen-like organic aerosols (HOA and OOA, respectively). This monthly resolved source apportionments was first compared with co-located real-time tracer measurements (NOx, BC, CO, . . . ) available at the Cape Corsica station. Seasonal patterns of the various properties of (secondary) OOA (oxidation state, double bonds abundance . . .) was then investigated from the monthly resolved source apportionment results (monthly OOA mass spectra) obtained over a period of 20 months (June 2012, March 2014).

Acknowledgements: Atmospheric measurements performed at Cape Corsica Station were mainly funded by CNRS-INSU, ADEME, Collectivité Territoriale de Corse through EU-FEDER Operational program 2007-2013, CEA, and METEO-FRANCE.