Over the past few years, we have developed and validated an exhaustive instrumental package allowing real-time characterization of the major chemical species of fine aerosols (AD < 2.5µm) and their gas precursors. These measurements are performed using:

+ A Particle-into-Liquid-Sampler (PILS) connected to Ion chromatphraphs (IC) for the determination of inorganic salts (Cl−, SO4²−, NO3−, C2O4²−, Na+, NH4+, K+, Mg2+, Ca2+) every 10 min.
+ A PILS connected to a Total Organic Carbon (TOC) for the determination of WSOC every 4 min.
+ A sunlight Field instrument for semi-continuous determination of EC and OC every 1 hour
+ A TEOM-FDMS enabling the determination of PM2.5 including semi-volatile material every 6 min.
+ A seven wavelength Aethalometer AE-31 enabling the determination of BC from fossil fuel and wood burning following the methodology reported by Sandradewi et al. (2008).
+ A proton transfer reaction mass spectrometer (PTR-MS) enabling real-time measurements of primary/secondary Volatile Organic Compounds every 5 min at sub ppbv concentration levels
+ A Wet Annular Rotating Denuder (WAD) coupled with IC enabling the determination of HCl, HONO, HNO3, SO2 every 10 min at pptv concentration levels
+ A Wet Effluent Denuder (WED) based technique (AIRRMONIA) for the determination of NH3 every 1 min.

This package has been deployed in the region of Paris (France) for different periods of the year in order to better characterize the seasonal pattern of specific sources (domestic heating, biogenic emissions) and processes (photochemistry).

A brief overview of the major results coming out from these different field experiments is given here and comprises results from the two large international (EU) field experiments performed in summer 2009 / winter 2010 within the EU-FP7-MEGAPOLI project (http://megapoli.dmi.dk/). A focus will be given here on the contribution of local domestic (wood) burning and long-range transported pollution which represent two major sources responsible for the PM pollution episodes in Paris.

Multi-year observations in the region of Paris will be performed from 2011 within the EU-FP7-ACTRIS project and using this real-time gas/aerosol instrumental package. Such monitoring activities will be performed at the French Atmospheric Supersite SIRTA (http://sirta.ipsl.polytechnique.fr/) which has been designed to host international field experiments.

First Author: Jean SCIARE
LSCE, BAT. 701, CEA Orme des Merisiers
91191 Gif-sur-Yvette Cedex, France
Email : Jean.sciare@lsce.ipsl.fr
Tel + 33 1 69 08 24 01 / Fax + 33 1 69 08 77 16
CV available at : http://www.lsce.ipsl.fr/Pisp/72/jean.sciare.html