PM concentration and chemical speciation measurements at two sites in Athens, Greece

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Introduction

Particulate matter (PM) ambient concentration levels are still a major environmental problem in several urban areas in the E.U., while new evidence of its long term impacts on human health continues to emerge. As the E.C. is moving towards the implementation of the thematic strategy on Air Pollution, information on PM_{10} and $PM_{2.5}$ concentration levels, as well as their main constituents, will be very useful in developing new regulations and evaluating current measures. In this framework, **Life+ project ACEPT-AIR** is aiming, among others, in constructing an **updated database on PM concentrations and chemical speciation** for three big urban cities in Greece (Athens, Thessaloniki and Volos). The obtained data will be further utilized for source apportionment.

Methods

This work presents the results from the **Athens** measurement campaigns, conducted during warm and cold period of 2011 – 2012 (around 50 days per season). PM_{10} and $PM_{2.5}$ were measured gravimetrically on a 24-hr basis, at two sites:

(1) N.C.S.R. "Demokritos" urban background station (GAW-DEM, 2007) and

(2) Nea Smyrni station of the National Monitoring Network (Figure 1).

Two types of filters were used for each size fraction (Teflon / Quartz) in order to allow for detailed chemical speciation. Analysis of filters is still in progress. The particle components targeted are: Elemental (EC) and organic (OC) carbon, determined through Thermal - Optical Analysis, Major and trace elements, by Atomic Absorption Spectrometry and X-Ray Fluorescence and Ionic species, by Ion Chromatography.

Results

The measured PM_{10} and $PM_{2.5}$ concentrations at the two stations were similar during warm period (Figure 2a). The relatively low levels are indicative of the background character of these two sites. Demokritos station exhibited even lower concentration levels during cold season,