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Particul'Air: a multi rural site experiment on aerosol chemistry in rural France

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There is an increasing concern all over Europe about a worsening of Air Quality due to domestic biomass combustion. Many studies showed over the last years that this source is responsible for a large share of particulate matter (PM) loading in very different types of environments (e.g. large cities, alpine valleys, rural sites...). However, there are still very few data available in order to evaluate the impact of this source in rural environments, particularly in France. The program Particul'Air was design to investigate this aspect together with the impact of other sources (vehicle emission, marine emission...) simultaneously over a large part of France.

Nine sampling sites were selected in small rural villages (pop below 2500 inhabitants), spreading from the West (Brittany) to the East (Franche Comté) of the country. Nine sampling periods of one week each were conducted simultaneously at the 9 sites, from March 2009 to February 2010, with daily sampling of PM10 at high flow rate. Additional measurements included PM mass (PM2.5 and PM10) and meteorological data were monitored. All filter samples were analyzed for EC/OC, major ionic species and LMW organic acids, levoglucosan, PAH, and organic tracers, and trace metals. Measurements of organic tracers were conducted on all samples of 5 of the campaigns.

Analyses conducted on this data base included apportionment of the influence of major sources by CMB. The overall results indicate that biomass combustion can indeed represent a very large share of the PM loading, with large variations according to the period and the site. Sites in mountainous areas are more subject to high concentrations and large impacts due to this source. However, sites close the Atlantic are far from being immune.