ATMOSPHERIC POLLUTION:
AIRBORNE PARTICULATE MATTER CHEMICAL CHARACTERIZATION AND SOURCE APPORTIONMENT

Innovations and Benefits - Air Quality is an important issue for human health and environmental protection, as well one of the European Commission main policy concern. PM is a complex mixture of physically and chemically different substances. PM is present in atmosphere as solid particles and liquid droplets, both of natural and anthropogenic origin, directly emitted (primary particles) into the atmosphere or as result of chemical reactions and physical aggregation processes (secondary particles). It is not to be considered as a single pollutant because of its heterogeneous nature, then its chemical and physical characterization is of primary importance. Main research activities are focused on: PM sampling campaign by means of standard methods in order to characterize PM major components; High time resolutions sampling campaign to provide more detailed information in order to better understand atmospheric behavior and associated human health risks. Source Apportionment (SA) with statistics-based receptor models (RM: PMF, Cluster Analysis, etc.).

Uses - PM chemical characterization; Development of innovative methods for sampling and analysis of atmospheric pollutants; Testing and comparison of air pollutants monitoring instruments and prototypes. Toxicological experiments: cell cultures direct exposition to atmospheric PM; Off-line Sampling Campaign (PM$_{10}$, PM$_{2.5}$, Carbonaceous Aerosols, Metals and Trace Elements, Water Soluble Inorganic Ions, Anhydrosugars); On-line, near-real time sampling campaign (Number of particles, PM$_{10}$, PM$_{2.5}$, PM$_{1}$, Carbonaceous Aerosols, Water Soluble Inorganic Ions, No-refractory (600°C) PM$_{1}$).

Source Apportionment analysis.