



## **SAPUSS! Solving Aerosol Problems by Using Synergistic Strategies**

Xavier Querol, Manuel Dall'Osto, and the SAPUSS Team

Consejo Superior de Investigaciones Científicas (CSIC), Institute of Environmental Assessment and Water Research (IDÆA),  
Barcelona, Spain (xavier.querol@idaea.csic.es, +34-(0)93-4110012)

The topic of this presentation is the source identification of particles in the atmosphere and the physical and chemical transformations occurring in them once emitted. Particles are injected directly into the atmosphere from a number of sources or formed in situ from gaseous precursors compounds. Our approach involves measurements of aerosols with multiple techniques occurring simultaneously, to deduce point source characteristics and to understand the atmospheric processes responsible for their modifications. Five sites were used in the city of Barcelona (NE Spain) during a one month campaign (October 2010): a main road, an urban background site, a regional background site and two towers (150m and 450m above sea level, respectively). The use of the synergy of highly time-resolved instruments (such as 2 Aerosol Time-of-flight Mass Spectrometer and 2 HR-Aerosol Mass Spectrometer – ATOFMS and AMS) was coupled with traditional off-line techniques (11 high-volume samplers at 12 hours resolution) in order to deduce all the information provided by them. A vast number of instruments were also deployed to characterize simultaneously all five sampling sites, including particle number and size-resolved concentrations. Two ceilometer were also used simultaneously horizontally and vertically in order to get close to the full picture of the source identification of particles in the atmosphere. This presentation will discuss: 3D distribution of PM<sub>1</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> across Barcelona under different boundary layer conditions, the evolution of nanoparticles in the atmosphere and the chemical composition of the aerosol obtained simultaneously across 5 sites in a major city in the Southern part of Europe.

SAPUSS Team: IDAEA-CSIC, Barcelona, Spain (M. Dall'Osto, X. Querol, A. Alastuey, M. Minguillon, F. Amato, M. Pandolfi, A. Karanasiou; T. Moreno, C. Reche, M. Cusak, M. Viana, J. Pey, A. Ripoll); University of Birmingham, UK (J. Gietl, D. Beddows, Roy M. Harrison); University of Cork, Ireland (J. Wenger, E. McGillcuddy, J. Sodou, R. Healy); NUI Galway, Ireland (D. Ceburnis, G. Martucci, C. O'Dowd); PSI, Switzerland (A. Prevot, L. Pfaffenberger); CIEMAT, Madrid, Spain (F. Gomez Moreno, B. Artíñano); University of Florence, Italy (F. Lucarelli, S. Nava); University of Colorado, USA (J. Jimenez), Jenoptic, Germany (S. Frey); Wehrwissenschaftliches Institut für Schutztechnologien, Germany (F. Wilsenack). Aerodyne (S. Ng, D. Worsnop), Àrea de Medi Ambient, Diputació de Barcelona (D. Casabona); Departament de Medi Ambient Generalitat de Catalunya (N. Cots).