



The Atmospheric Reactivity studies Platform of Orléans - France

Véronique Daële¹, Valéry Catoire², Alexander Kukui², Abdelwahid Mellouki¹

¹ CNRS/ICARE (Institut de Combustion, Aérodynamique, Réactivité et Environnement),
FRANCE
(1C Avenue de la Recherche Scientifique, CS 50060, 45071 Orléans cedex 2)

² CNRS/LPC2E (Laboratoire de Physique et Chimie de l'environnement et de l'Espace),
FRANCE
(3A Avenue de la Recherche Scientifique, 45071 Orléans cedex 2)

veronique.daele@cnrs-orleans.fr

The Atmospheric Reactivity studies Platform of Orléans (PRAT) is dedicated to the characterization of atmospheric air pollution and chemical and dynamic processes associated with air quality and global change issues. PRAT is composed of:

- The atmospheric simulation chamber with natural irradiation of Orleans (HELIOS) which is dedicated to studies of photochemical processes in the atmosphere under controlled and realistic conditions. HELIOS is a large hemispherical chamber (volume of 90 m³), made of FEP film and positioned on the top of ICARE-CNRS building. It is equipped with advanced analytical instruments that allow the characterization and monitoring of the evolution of pollutants under the influence of sunlight or in the dark.
- The Super-Site VOLTAIRE HELIOS, located on the CNRS campus of Orleans, dedicated to the measurement and monitoring of air pollutants (gas and particles). The measurements are conducted continuously for certain law-regulated pollutants such as ozone (O₃), nitrogen oxides (NO and NO₂) and particulate matter (PM10).
- The other two instrumental sets are being developed in our laboratories: *in situ* spectrometry with four infrared lasers (SPECIES; compounds which can be simultaneously measured with sub-ppb detection limits, among others: CO, CH₄, NO, N₂O, HNO₃, H₂O₂, HCl, HOCl, COF₂, HCHO, HCOOH, O₃, NH₃, NO₂, H₂O, OCS) and Atmospheric Mass Spectrometry (AMS) with Orbitrap (dedicated to the detailed study of the chemical composition of organic aerosols) and SAMU (a chemical ionization mass spectrometer: CIMS for HO₂, OH, RO₂, H₂SO₄ detection).

This "PRAT" is part of a large regional project (PIVOTS) which is a coordinated set of experimental and analytical platforms dedicated to the development of "engineering and environmental metrology for high consumption of natural resources activities" and federating public bodies and private players. Its objective is to achieve the integration of academic players and companies at all levels of the value chain of the quality of the environment monitoring and the sustainable management of natural resources (soil, subsoil, surface water, groundwater, sediment, air).

The characteristics of this platform will be presented