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The Atmospheric Reactivity studies Plateform of Orléans – France

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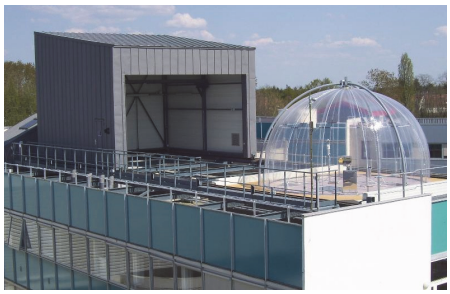
The Atmospheric Reactivity studies Platform of Orléans (PRAT) is composed of:

HELIOS: Atmospheric simulation chamber with natural irradiation of Orléans



Objectives

- Characterization and monitoring of the evolution of pollutants under the influence of sunlight or in the dark
- Kinetics measurements and mechanisms development

Description

- Hemisphere of 6 m diameter (90 m^3) made of FEP film
- Ultrapure air (atmospheric P° & T°)
- Used under sunlight, artificial lights or in the dark
- Mobile protective structure
- Laboratory of 110 m^2 (under the chamber) equipped with advanced analytical instruments (in situ FTIR, PTR-TOF-MS, API-TOF-CIMS ; Gas (NO, NO_2, NO_3, O_3, HONO, HCHO, CO, SO_2) and particles analyzers ; Chromatographs, Spectrometers …)

+

Super-site VOLTAIRE HELIOS

Objectives

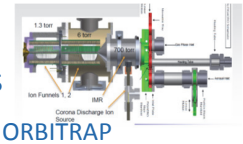
- Air quality monitoring and research
- Regular pollutants measurements (gases and particles)
- Education and Training

Description

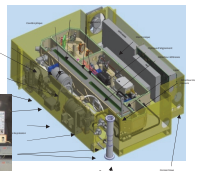
- Located on the CNRS campus of Orléans
- Permanently measured: O_3 and NOx monitors, PM10 (law-regulated pollutants); meteo station

Instrumental development

- SPECIES : in situ spectrometer with four infrared lasers Compounds which can be simultaneously measured with sub-ppb detection limits, among others: CO, CH_4, NO, N_2O, HNO_3, H_2O_2, HCl, HOCl, COF_2, HCHO, HCOOH, O_3, NH_3, NO_2, H_2O, OCS



- Atmospheric Mass Spectrometry (AMS) with ORBITRAP Dedicated to the detailed study of the chemical composition of organic aerosols

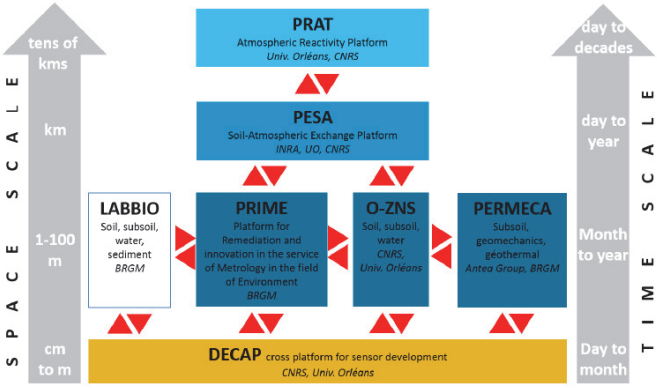


- SAMU: chemical ionization mass spectrometer: CIMS for HO_2, OH, RO_2, H_2SO_4 detection

- CRDS: Cavity Ring Down Spectroscopy to measure NO_3 radicals and particles

PRAT is part of large regional project (PIVOTS):

- Coordinated set of experimental and analytical platforms for environmental metrology and remediation.
- Designed for various scales (space and time), matrices e.g. soils, water, air) and contaminants, *in vitro* and *in situ*.
- Federating public bodies and private players
- Open to both academics and industry



Specific themes of PRAT:

Air quality and impacts | **From local to global pollution**

- Indoor air quality
- Atmospheric aerosol formation
- Pollutants deposition
- Climate effect of the degradation products of VOC (including fluorinated)

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