



Atmospheric anthropic impacts tracked by the French atmospheric mobile observatory

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A new ATmospheric Mobile ObServatory, so called "ATMOS", has been developed by the LiMAG "Lidar, Meteorology and Geophysics" team of the Institut Pierre Simon Laplace (IPSL) in France, in order to contribute to international field campaigns for studying atmospheric physico-chemistry, air quality and climate (i.e. aerosols, clouds, trace gases, atmospheric dynamics and energy budget) and the ground-based validation of satellite observations. ATMOS has been deployed in the framework of i) LISAIR, for monitoring air quality in Paris in 2005, ii) AMMA "African Monsoon Multidisciplinary Analysis", in Tamanrasset and in Niamey for observing the aerosols and the atmospheric boundary layer in the Sahara and in the Sahel in 2006, iii) COPS "Convectively and Orographically driven Precipitation Study" in the Rhin Valley in 2007 and iv) the validation of the spatial mission CALIPSO, launched in April 2006. In the coming years, ATMOS will be deployed i) in the Paris Megacity, in the framework of MEGAPOLI (2009-2010), ii) in southern France (near Marseille) for the Chemistry-Aerosol Mediterranean Experiment CHARMEX (2011-2012) and iii) the validation of ADM-Aeolus in 2010-2011 and Earth-Care in 2012.

ATMOS payload is modular, accounting for the different platforms, instruments and measuring techniques. The deployment of ATMOS is an essential contribution to field campaigns, complementing the fixed sites, and a potential alternative of airborne platforms, heavier and more expensive. ATMOS mobile payload comprises both the remote sensing platform MOBILIS ("Moyens mOBILES de tÉLÉdetection de l'IPSL") and the in-situ physico-chemical station SAMMO ("Station Aérosols et chiMie MOBILE"). MOBILIS is an autonomous and high-performance system constituted by a full set of active and passive remote sensing instrumentation (i.e. Lidars and radiometers), whose payload may be adapted for either i) long term fixed monitoring in a maritime container or a shelter, ii) ground-based transect observation onboard small car and ii) an airborne deployment in an ultra-light airplane (ULA). SAMMO is a fully equipped in-situ sensor payload, oriented to pollution monitoring (i.e. particles and trace gases), onboard a truck.