



## **Role of local meteorological phenomena on the measurement of background pollution in high altitude monitoring stations**

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A pollutant monitoring network (PAES - French acronym for "air pollution at synoptic scale") has been set up in France in order to evaluate the background pollution in the free troposphere, by measuring the ozone and its precursors at high altitude sites. The highest station of this network is located at the top of the "Pic du Midi" (2875 m asl), a peak on the French side of the Pyrenees barrier. Four years measurements have revealed there an unusual behaviour of the daily ozone evolution in summer. The ozone cycle is indeed opposite to the classical diurnal photochemical production and nocturnal destruction cycle, a minimum concentration being observed at daytime. The local meteorology induced by the topography has been suspected to be responsible for this peculiarity. We present results of a campaign combining a field experiment and numerical simulations, which was led during July 2005 to investigate the role of these dynamical processes on the ozone measurements. Four ground stations were instrumented for monitoring the pollutants and meteorology at "Pic du Midi" and in the neighboring valleys and plain. Various ground-based remote sensing systems have been used to continuously characterize the troposphere behaviour through many atmospheric parameters. The wind features (wind profile, reflectivity, turbulence) were measured by VHF and UHF wind profilers (from "Laboratoire d'Aérodologie") and the vertical distribution of ozone concentration and extinction were studied by using two complementary ozone lidars (ALTO from "Service d'Aéronomie" and ULCO from "Université du Littoral") for the upper and lower troposphere. We will give an inter-

pretation of the ozone 3D distribution retrieved from the lidar observation around the “Pic du Midi” on July, 2nd 2005, by integrating the experimental network and the simulations with the 3D non hydrostatic atmospheric model Meso-NH (“Laboratoire d’Aérodologie”).