

The Agia Marina Xyliatou Observatory: A remote supersite in Cyprus to monitor changes in the atmospheric composition of the Eastern Mediterranean and Middle East

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Keywords: Atmospheric aerosols, Reactive gases, Ground observations, UAV

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The Eastern Mediterranean and Middle East (EMME) region has been identified as one of the hot spot region in the world strongly influenced by climate changes impacts. This region is characterized by rapidly growing population with contrasting economic development, strong environmental gradients and climate extremes. However, long-term observations of the atmospheric constituents (gaseous and particulate) of the atmosphere at a remote site representative of EMME is still missing making difficult to assess current and future impacts on air quality, water resources and climate. In collaboration with the Department of Labour Inspection and in the frame of French research programs (ChArMEx and ENVI-Med "CyAr") and the EU H2020 "ACTRIS-2" (2015-2019) project, CyI and CNRS are putting unprecedented efforts to implement at a rural site of Cyprus (Agia Marina Xyliatou, Figure 1) a unique infrastructure to monitor key atmospheric species relevant to air quality and climate.



Figure 1: Pictures of the atmospheric observation facilities at Agia Marina Xyliatou.

A large set of real-time instrumentations is currently deployed to characterize reactive gases (incl. O₃, CO, NO_x, SO₂, VOC), in-situ aerosol properties (mass, size distribution, light scatt./absorption/extinction coef. and chemistry, Figure 2) and as well as integrated optical properties (sunphotometer, solar flux).

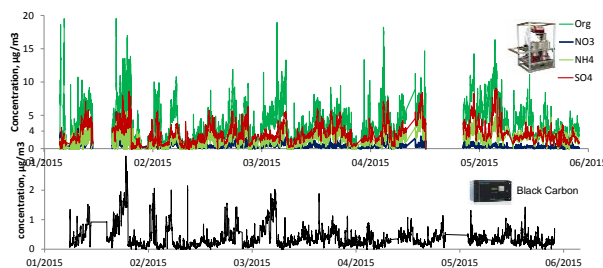


Figure 2: Near-real-time observations of the major chemical constituents of PM₁ (BC, OM, SO₄, NH₄, NO₃) with Q-ACSM and Aethalometer (January - June 2015)

Through Transnational access (H2020 ACTRIS2), this station is offering to (non-)EU partners (Research, SMEs) a new atmospheric facility to monitor long range transported clean/polluted air masses from 3 different continents (Europe, Africa, Middle East) and investigate aerosol-cloud interactions through the use of UAV (Figure 3) and a mountain site (Troodos, 1900m asl).



Figure 3: Take-off of one the CyI UAV dedicated to gas/aerosol observations at the Agia Marina Xyliatou airfield.

We will present here an overview of this new research infrastructure and provide a first glance of key features observed from gas/aerosol measurements obtained in 2015.